FLIPPED LEARNING AND SELF-
REGULATED LEARNING EXPERIENCES
IN HIGHER EDUCATION: A
QUALITATIVE CASE STUDY

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DEDICATION

This thesis is dedicated to my brother Khaled, who, although no longer with us, continues to inspire me by his example, dedication, and wisdom. His belief in me has made this journey possible. O Allah, admit him into paradise.
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STATEMENT OF AUTHENTICATION

This work contains no material which has been accepted for the award of another degree or diploma in any university or other tertiary institution, and to the best of my knowledge and belief, contains no material previously published or written by another person except where due reference is made in the text.

Adel Alamry

August, 2017, Sydney
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**ABSTRACT**

In flipped learning, traditional face-to-face lectures are replaced by the online delivery of material to be studied by students outside the classroom context. Class time is redirected to more engaging, student-centred activities such as the discussion and application of the material acquired outside class. As such, the flipped learning model normally entails more independent learning on the part of students than the traditional approach. This qualitative case study used Pintrich’s self-regulated learning framework to examine self-regulated learning in the context of flipped learning for students in a pre-service teaching program at an Australian university. This study was conducted in order to understand the perceptions and behaviours of 20 female pre-service teachers enrolled in a flipped learning unit. After piloting recruitment procedures and testing focus group interview questions, multiple data collection methods were used to generate the findings of the study. The data sources consisted of focus group interviews, semi-structured interviews, students’ reflective learning journals, and trace data. The data was coded and analysed for emergent themes. In contrast with previous studies of flipped learning, the research revealed considerable differences between students’ experiences and evaluations of flipped learning, and differences in the extent to which they demonstrated various forms of self-regulated learning. Three main ways in which the flipped learning environment fostered the use of self-regulated learning were identified: (a) promoting independent learning; (b) improving engagement in learning; and (c) providing improved flexibility in relation to time and students’ learning methods. The findings also revealed three main ways in which the flipped learning unit appeared to hinder the students’ ability to experience self-regulated learning: (a) timetabling and delivery issues; (b) a lack of adequate support; and (c) insufficient opportunities for collaboration and engagement with peers. Overall, the results indicate that the use of flipped learning per se does not
necessarily result in self-regulated learning, and highlights the importance of specifically tailoring the design of flipped learning units in ways that promote or facilitate self-regulated learning among all learners. As such, this thesis offers a number of specific recommendations for the design and implementation of flipped learning initiatives in higher education. The findings also indicate that Pintrich’s theory of self-regulated learning remains useful and relevant for research into flipped learning.
1 INTRODUCTION

1.1 Introduction

Worldwide, higher education is increasingly being redesigned to meet the needs and preferences of today’s learners while taking advantage of technological advances. In Australia, Gosper et al. (2010) reported that “the uptake of web-based lecture technologies and delivering live lectures has increased markedly in recent years” (p. 84). Flipped learning, which has been growing in use over the past 15 years or so, is one educational method that is expected to become increasingly popular in line with the growth of more student-centred approaches to learning and demands for more flexible forms of lifelong learning (Green, 2015; O’Flaherty & Phillips, 2015). With traditional face-to-face lectures being replaced by the online delivery of material, flipped learning requires that for a large proportion of the time, students learn independently outside the classroom (Butt, 2014). Classroom time is used mainly for collaborative and interactive activities relevant to the material learned, and the teacher becomes a facilitator of learning and not the main vehicle by which material is transmitted, as in the traditional university setting (Butt, 2014). Like other forms of distance learning, the use of this approach is
facilitated by advances in information and communications technology (ICT) that enable students to readily access learning tools and resources from home.

Although there is not yet a single agreed definition of what constitutes the flipped learning model (Abeysekera & Dawson, 2014), the available evidence suggests that whatever the particular definition used, flipped learning potentially offers significant benefits for learners and often results in positive academic outcomes (e.g., De George-Walker & Keefe, 2010; Giannakos, Krogstie, & Chrisochoides, 2014; McLaughlin et al., 2013; Talbert, 2014; Zainuddin & Halili, 2016). Zainuddin and Halili (2016), for example, conducting a content analysis of 20 journal articles on the flipped learning model published between 2013 and 2015, found reported evidence of positive impacts on student achievement, motivation, engagement, and interaction, in a wide variety of subject fields.

Importantly, since flipped learning requires students to study independently for much of the time, it also involves an elevated need for effective self-regulation of learning. Without effective self-regulation on the part of students, a flipped learning unit may not be as beneficial, or could even diminish educational benefits in terms of students’ achievement, motivation, engagement, and interaction (Bouwmeester, de Kleijn, ten Cate, van Rijen, & Westerveld, 2016; McLaughlin et al., 2013). It is thus vital to explore the links between self-regulation of learning on the part of students and a flipped learning approach to education. Indeed, theories of self-regulated learning are well established in the educational research literature and the use of self-regulated learning within a variety of elements has been shown to be associated with positive outcomes from the learning process (e.g., Boekaerts & Niemivirta, 2000; Borkowski, 1996; Pintrich, 2000; Winne & Hadwin, 1998; Zimmerman, 2000). However, relatively little—not to say no—research has been conducted to date into the use of self-regulated learning in a higher educational
flipped learning context, or into the factors that influence self-regulated learning in this setting, especially as it applies to tertiary education in Australia (Abeysekera & Dawson, 2014). The present study is intended to address this research gap by examining how the flipped learning model may promote self-regulated learning among undergraduate and graduate students enrolled in a pre-service teaching program at an Australian university, and by exploring the factors influencing the use of self-regulated learning in this context.

If this lacuna in our knowledge were to remain unfilled, educators may lack a crucial element in the explanation of the relative effectiveness of the ever-greater number of applications of the flipped learning model in the tertiary education sector in Australia.

As to the focus on pre-service teaching students, an important implicit issue of concern is that many of these students will themselves be teachers in the future. As such it is important that they be exposed to innovative teaching practices, including flipped learning, and the kinds of self-regulated learning strategies required for such a model. By experiencing a flipped learning unit first-hand, prospective teachers will be better able to critically reflect on the value of flipped learning as a student-centred approach and be better prepared to teach in technology-enhanced classrooms in the future (Hao & Lee, 2015). Concomitantly, it is important for education researchers to understand the concerns that pre-service teachers have about flipped learning in order to conceptualise how to begin to address such concerns (Hao & Lee, 2015). Further, identifying and raising prospective teachers’ awareness of self-regulated learning strategies is important for the design and implementation of flipped learning in the future (Lee, Teo, & Chai, 2010). This is not to say that the study and its findings are necessarily restricted to pre-service teaching students. There are likely to be some insights which can be gleaned from the current study relevant to the design and implementation of flipped learning units and
the associated self-regulated learning strategies needed in a wide variety of disciplines, such as business, medicine, psychology, and law.

1.2 Background

The flipped learning model has been gaining greater attention in higher education in recent years. It has often been argued that this reflects the ascendancy of student-centred, active learning pedagogies and the growing demand for lifelong learning, which are increasingly facilitated by the use of new ICT (Allen & Velden, 2011; Hao, 2016; Rahman, Aris, Mohamed, & Zaid, 2014). The flipped learning approach represents an important innovation in university education, and one that requires new types of skills on the part of students and teachers alike, as well as the development of a learning environment that supports and promotes the development of these skills.

In the case of students, the ability to self-regulate learning is especially important in a flipped learning environment, and essential to achieving the intended learning outcomes. Many authors have stressed the importance of self-regulation of learning in the tertiary education sector in general (e.g., Balapumi, von Konsky, Aitken, & McMeekin, 2016; Cassidy, 2011; de Boer, Donker-Bergstra, Kostons, Korpershoek, & van der Werf, 2013; Dresel et al., 2015; Roth, Ogrin, & Schmitz, 2016). This is especially important in the flipped learning model where the main responsibility for knowledge construction is shifted to the learner, and the teacher serves mostly as a facilitator of the students’ self-directed learning practices (Butzler, 2016). This requires, on the part of a student, the ability to reflect on one’s own motivation to learn and to regulate that motivation, to plan one’s time and effort efficiently, and to be aware of the contextual factors that can have an impact on learning and be able to manage these effectively (Azevedo, 2009; Balapumi et al., 2016; Butzler, 2016; Pintrich, 2004).
However, researchers have found that many students arrive at universities without the skills needed for self-regulated learning (Balapumi et al., 2016; Cassidy, 2011; Roth et al., 2016). Moreover, it has been observed that appropriate training or other resources to help them develop these self-regulation abilities are often lacking (Cassidy, 2011; de Boer et al., 2013; Endedijk, Vermunt, Meijer, & Brekelmans, 2014; Hattie, Biggs, & Purdie, 1996). Cassidy (2011) highlighted the need to support students in developing learning strategies, developing positive self-efficacy, and setting and pursuing meaningful goals, as well as the importance of introducing more curricular activities focused on the development of cognitive skills and metacognitive skills. Further, Cassidy (2011) stressed the importance of establishing an overall environment conducive to self-regulated learning, which takes into account the physical setting, the resources provided, and the need for appropriate social interactions. In this respect, Cassidy (2011) also emphasised the need for the use of appropriate ICT to support self-regulated learning. This is supported by the findings of qualitative research into self-regulated learning by Dresel et al. (2015), based on semi-structured interviews with lecturers, which highlighted the need for more training to be provided for scaffolding students’ self-regulated learning, either informally within regular course settings or in more formal, dedicated programs.

In sum, on the one hand, there has been considerable research conducted into self-regulated learning, and on the other, flipped learning has emerged as a pedagogical innovation in higher education. An interesting question is: what kind of relationship might exist between self-regulated learning and flipped learning?

1.3 Statement of the Problem

Researchers have demonstrated an association between self-regulated learning and positive learning outcomes (e.g., Pintrich & De Groot, 1990; Zimmerman, 2000a), but most previous research in this area has been carried out in traditional, instructor-led
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educational settings, and not in a flipped learning context. Although the concept and practice of flipped learning have been in existence in one form or another for more than 15 years, and researchers have demonstrated positive educational outcomes from this approach (De George Walker et al., 2010; Giannakos et al., 2014; McLaughlin et al., 2013; Talbert, 2014b; Zainuddin & Halili, 2016), there has been little attempt to examine the impact of this learning model on self-regulated learning or to investigate the ways in which the model needs to be adapted to the needs of different learners and educational settings in order to ensure that optimal academic outcomes can be achieved (Abeysekera & Dawson, 2014; Chen, Wang, Kinshuk, & Chen, 2014). In Australia, in particular, although there are greater moves to introduce the flipped learning model (such as at Western Sydney University, where the School of Business has “flipped” all its undergraduate degree units), very few studies have been conducted to date on student experiences of flipped learning in the higher education context (O’Flaherty & Phillips, 2015). The relative lack of research-based evidence for flipped learning means that flipped learning initiatives are often introduced with little consideration of how they should be designed in order to promote self-regulated learning among students. Gosper et al.’s (2010) study of online units in a sample of Australian universities confirmed that, although higher education delivery methods have been changing in recent years, approaches to teaching have not evolved in line with the changing delivery methods, and students are often receiving little support for their learning. It thus seems clear that if new modes of delivery—in particular, flipped learning—are to be validated and potentially improved, there needs to be concerted research conducted on its effectiveness, especially vis-à-vis the role played by self-regulation on the part of students.

Furthermore, as demonstrated by Roth et al. (2016), most previous research on self-regulated learning has been conducted using quantitative methods to identify and measure
self-regulated learning behaviours and their impact on learning outcomes. Rigorous quantitative analysis of students’ characteristics and behaviour is a powerful means of investigating the empirical associations between variables that may help to account for the educational effectiveness (or not) of certain kinds of self-regulatory practices. Quantitative analyses are strongest when the phenomena of interest are objectively observable variables, such as demographic attributes, measurable behaviour and standardised academic performance (Creswell, 2013). The current study, however, is interested in self-regulation in a flipped learning context from the perspective of the student—focusing on the students’ own personal experiences and opinions because, as Merriam (2009) argues, in order to be able to understand any lived human phenomenon fully, it must, in part at least, incorporate how people themselves phenomenologically perceive it “from the inside”. A purely quantitative approach is not ideally suited to such a perspective. Unfortunately, relatively few studies have used qualitative methods to investigate the phenomenological experiences of self-regulated learning or flipped learning from the students’ perspectives (e.g., Kopcha et al., 2015; Tawfik & Lilly, 2015; Moos & Bonde, 2016). There is thus a pressing need for qualitative research to provide subjective, lived insights into the ways in which higher education students learn in a flipped learning unit, as well the factors that influence this, and their overall experiences of flipped learning. This is not to say that no quantitative input (such as demographic information and measurable online behaviour) is used in the present study; rather that qualitative information about students’ experiences is the central focus.

1.4 Theoretical Framework

This qualitative study is founded on a constructionist epistemology and conducted from an interpretivist perspective. Within this epistemological and theoretical approach, Pintrich’s (1991, 2004) self-regulated learning model and accompanying measurement
tool, the Motivated Strategies for Learning Questionnaire (MSLQ), formed the theoretical and analytical framework for the study. Pintrich’s framework has been used because it is closely informed by a well-established social cognitive theory (Bandura, 1991) and because it incorporates learners’ cognitive, motivational, and behavioural self-regulation as a “mediator” between the learners’ characteristics and the learning environment—in this case, a flipped learning unit (Puustinen & Pulkkinen, 2001).

Pintrich’s model has its origins in Bandura’s (1991) article, “The Social Cognitive Theory of Self-Regulation”, which was based on a constructivist theoretical approach to understanding the ways in which humans regulate their behaviour. The major self-regulative mechanisms of human behaviour identified in Bandura’s social cognitive theory consist of: monitoring of one’s own behaviour, its determinants, and its effects; judgment about one’s behaviour in relation to personal standards and environmental circumstances; and affective self-regulation (Bandura, 1991). Using self-regulation, as understood in terms of Bandura’s social cognitive theory, is essential for learners to control their cognition, motivation, and behaviour in order to achieve their learning goals (Balapumi et al., 2016).

Pintrich’s model builds on this theoretical perspective by identifying three main elements of self-regulated learning: (a) motivational strategies, (b) learning strategies, and (c) resource management strategies. In turn, these are composed of several different components representing different aspects of self-regulated learning, with detailed descriptions that are valuable for the purpose of identifying examples of self-regulated learning from research data. Specifically, the motivational strategies element of the model has three main components: a value component, an expectancy component, and an affective component. Each component in turn has a number of different dimensions. These relate to the ways that learners conceptualise tasks in order to motivate themselves
to complete them, their beliefs about their own abilities to successfully complete the tasks, and the potentially negative impacts of affective factors on the self-regulated learning process. The *learning strategies* element of Pintrich’s (1991, 2004) self-regulated learning model consists of five cognitive and metacognitive learning strategies: *rehearsal, elaboration, organisation, critical thinking,* and *metacognitive self-regulation.* These all relate to various methods and techniques that students can use to enhance their learning. Finally, the *resource management* element of Pintrich’s (1991, 2004) framework consists of four strategies relating to: the learner’s management of his or her *time and study environment,* the learner’s own *effort regulation,* the learner’s use of *peer learning,* and the learner’s *help seeking.* This element of the model reflects the importance of effectively managing the various types of resources available to learners, as well as their own cognition.

The framework is prima facie a useful way of conceptualising self-regulation in the flipped learning model because the latter presupposes a more independent and self-directed role for students in the learning process. In a flipped learning environment students are, for example, very often expected to engage in more study by themselves online, beyond the confines of a face-to-face, on-campus classroom, at a time of their own choosing, and in a manner of their own devising. As such, the *motivational strategies* they rely on to maintain their study efforts over time, the *learning strategies* they utilise to absorb and understand content provided, and the *resource management strategies* they deploy all become increasingly important to their overall learning experience and, ultimately, their academic performance.

1.5 Research Objective and Questions

Using Pintrich’s model as a theoretical and analytical framework, the overall objective of this study was to provide “thick” description of the experiences of flipped
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learning and self-regulated learning among students at an Australian university. This objective was chosen in order to explore the possible associations between the flipped learning model and self-regulated learning in higher education from the perspective of students’ own realities and experiences. Without this perspective, research into this association lacks a crucial phenomenological dimension that helps us to understand students’ behaviour and performance in a flipped learning environment. To achieve this, a number of research questions were formulated for the purpose of guiding the data collection and analysis of findings. The central question of the study was:

Main research question: What is the role of the flipped learning model in self-regulated learning in the context of higher education?

Three more-specific research questions supported this central question. These questions were:

Sub-research question 1: What forms of self-regulated learning are demonstrated by students in the flipped learning model?

Sub-research question 2: What are the possible factors that influence students’ self-regulated learning in the flipped learning model?

Sub-research question 3: How is students’ self-regulated learning being shaped by the flipped learning model?

The methodology used to address these research questions is outlined in the following section.

1.6 Methodology

The research was conducted with a sample of second-year undergraduate and first-year master’s students taking a “flipped” learning unit in a pre-service teaching at an Australian university. In this unit, which was conducted for one semester (14 weeks),
students attended a tutorial session once a fortnight and studied independently and remotely for the majority of the time via an online learning system (Blackboard Learn).

The participants were purposively selected from a cohort that was enrolled in the teaching program offered across three campuses of the university. Eligible students were invited to participate in the study, and a diverse sample of 20 students representing a range of ages, ethnicity, and years of tertiary education experience was selected.

Within the overall qualitative approach of this study, multiple data collection methods were used over the 14-week semester. The three main forms of qualitative data collection methods consisted of: (a) semi-structured learning reflection logs, which were completed by students at three points during the semester; (b) focus group interviews, which were held during the first half of the semester; and (c) in-depth individual interviews, of which there were two per student in the second half of the semester.

The qualitative data were analysed using a combination of thematic analysis and selective coding. Selective coding using a deductive or top-down approach was deemed to be most appropriate for use in addressing sub-research question 1 of this study (Yin, 2011). This was intended to provide evidence of the kind of self-regulated learning that occurs in a flipped learning environment, based on the self-regulated learning framework developed by Pintrich (1991, 2004). The inductive or thematic approach, which focuses on understanding phenomena from the perspective of individual realities and is commonly used in phenomenological research (Yin, 2011), was used to address sub-research questions 2 and 3. This enabled me to understand the students’ personal experiences of the flipped learning model and to gain new insights into the factors influencing these experiences and the ways in which flipped learning promotes or hinders self-regulated learning.
To complement the main qualitative data collection tools and triangulate the research findings, trace data based on students’ engagement with the online learning system were also collected, and analysed using descriptive analysis (Hadwin, Nesbit, Jamieson-Noel, Code, & Winne, 2007). (‘Trace data’ refers to electronic records (logs) of students’ behaviours and activities when they interact with the unit’s content online on the Blackboard website. For the purpose of this study, Blackboard Learning Analytics was used as a trace data tool. Using this tool, enables one to construct a digital profile of each participant for the online portion of the flipped learning model unit. It includes, for example, which pages and folders students view, how many times they visit them, which files are downloaded, which quizzes they attempt, when they attempt them and their marks, how many times they participate on the discussion board, and so on.)

1.7 Significance of the Study

As higher education institutions worldwide increasingly adopt the flipped learning model, it is essential to understand how this model can support the types of self-regulated learning that are proven to be important in ensuring that positive academic outcomes can be achieved from the learning process (Pintrich & De Groot, 1990; Zimmerman, 2000a). In this way, flipped learning initiatives can be designed in ways that enable higher education institutions to deliver the types of lifelong learning being promoted by the Organization for Economic Cooperation and Development (OECD) (Hoidn & Kärkkäinen, 2014) and in many national education policies around the world (de Boer et al., 2013; Johnson et al., 2014). Flipped learning potentially offers an efficient method of delivering more learner-centred programs in place of the traditional instructor-led approach (O’Flaherty & Phillips, 2015), but it must be effectively designed in order to achieve this.
The present study offers valuable insights into the impact of a flipped learning unit on self-regulated learning from the experientially-informed perspectives of learners themselves. This type of information is essential in order to highlight the specific ways in which flipped learning programs might be designed, and the types of tools and resources they should incorporate, in order to maximise self-regulated learning among all students and ensure that the learning goals of these programs can be achieved.

Acquiring knowledge of the impact of a flipped learning model on self-regulated learning is especially important since researchers have reported that there is little evidence of teaching styles being modified to fit the flipped learning model (Abeysekera & Dawson, 2014; Chen et al., 2014). Previous studies (e.g., Cassidy, 2011) have highlighted the need to provide a suitable learning environment, including appropriate support and resources for students, in order to promote the use of self-regulated learning. This is especially important when using the flipped learning model, which requires students to study independently for a large proportion of the time. That said, this area requires further empirical investigation given the relative newness of applications of the flipped learning model. Essentially, there is a very limited evidence base from which to develop design recommendations that promote the self-regulated learning necessary to generate positive academic outcomes from flipped learning programs. Further, the research that does currently exist is mostly quantitative in nature. This study addresses this gap by using qualitative methods to provide important insights into learners’ personal experiences of a flipped learning program, their use of self-regulated learning in this program, and the factors influencing these. Although the findings are specific to the case study research setting, they are also likely to be of interest and practical relevance to other universities developing similar flipped learning programs.
Although it is not the core purpose of the present research, this study may demonstrate the value of using Pintrich’s model of self-regulated learning as a theoretical and analytical framework for examining self-regulated learning in a flipped learning environment using qualitative methods. Like other self-regulated learning models (e.g., Zimmerman, 1990), this was originally developed at a time when the traditional, teacher-centred, face-to-face model of higher education was still dominant. Because research has lagged behind the rapidly changing tertiary education environment, there has been a gap in knowledge about the continuing relevance, efficacy, and value of theories of self-regulated learning in this context. As such, the present study assists in confirming the continuing relevance of Pintrich’s model in today’s higher education environment, as well as highlighting the ways in which this model might be modified to better reflect the characteristics of today’s learning environment and the changing needs of learners. Further, Pintrich’s (1991, 2004) model and accompanying measurement tool were primarily designed for use in research based on quantitative methods, and have been mainly used in this way by previous researchers. This study demonstrates the broader applicability of these tools for future research using qualitative as well as quantitative methods.

1.8 Chapter Summary

This chapter has set out the background, objective, and research questions of this primarily qualitative case study research, which examines how the flipped learning model may promote self-regulated learning among undergraduate and graduate students enrolled in a pre-service teaching program at an Australian university and explores the factors influencing the use of self-regulated learning in this context. It has discussed the significance of the research in terms of generating research-based evidence to help improve the future design of flipped learning initiatives in the higher education context so
that these initiatives promote self-regulated learning and positive academic outcomes. Since the study used qualitative, case study methods, the results are directly relevant to this setting and sample of learners. Nonetheless, the research does generate valuable insights that can be used to design similar research in other settings, as well as practical recommendations that can be considered for adoption in a range of higher education flipped learning environments. This is especially important in the context of worldwide changes in the design and delivery of higher education, and the increased emphasis on and demand for lifelong learning. The study will also help to demonstrate the continuing relevance of a classic model of self-regulated learning to a modern technology-focused educational environment.

The following chapter sets out the findings of a review of literature on self-regulated learning and flipped learning that was conducted to inform the design and implementation of the current study and to ensure it was well grounded in existing research in these areas.
2 LITERATURE REVIEW

2.1 Introduction

The flipped learning model has recently been gaining increased attention in higher education, as a practical manifestation of the growing theoretical perspective that emphasises student-centred pedagogy and active learning through the use of technology (Allen & Velden, 2011; Hao, 2016; Rahman et al., 2014). These developments reflect major changes that are underway in the design of higher education worldwide, to meet the changing lifestyles and the learning practices of students, and to take advantage of rapid advances in ICT. In this context, the flipped learning model aims to “remove [the] traditional transmissive lecture and replace it with active in-class tasks and pre-/post-class work” (Abeysekera & Dawson, 2014). This new form of organising learning in a more active and flexible fashion requires new skills on the part of both students and teachers. Although various forms of flipped learning have been in use for more than 15 years, little attention has been paid to the design principles of this approach (M. Kim, Kim, Khera, & Getman, 2014) or the self-regulated learning strategies that students in a flipped learning program need to develop.
To ensure that the current study was informed by relevant research in these areas, a review was conducted to identify the most relevant and up-to-date literature relating to the development of self-regulated learning skills in the flipped learning context. The primary focus of the review was the literature relevant to self-regulated learning and flipped learning in higher education, and more specifically, to the pre-service teacher-training context and the Australian higher education system. Since the existing body of research in this area is relatively new and thus still quite limited, the searches were also expanded to identify other relevant literature beyond pre-service teacher training and the Australian higher education system. The main purpose of the literature review was, therefore, to identify any previous studies relevant to the impact of the flipped learning model on students’ self-regulated learning in higher education—an area in which a significant research gap has been pointed out by various authors (Betihavas, Bridgman, Kornhaber, & Cross, 2016; Butzler, 2016; Chen et al., 2014; Rahman et al., 2014; Taub, Azevedo, Bouchet, & Khosravifar, 2014; Tawfik & Lilly, 2015). The review thus had two main objectives:

1. To identify and provide understanding of the existing theoretical models of self-regulated learning and flipped learning.
2. To identify insights from evidence-based research on flipped learning initiatives, in order to determine what is already known about the impact on students’ self-regulated learning processes.

The specific methods used to identify literature and present the findings of the review are discussed in the following section.
2.2 Search Methods

Following Cronin, Ryan, and Coughlan's (2008) recommendations for conducting a literature review, this study used a narrative review approach for the first part, and a systematic review approach for the second part.

The first part (sections 2.3 to 2.5) summarises the findings of the review regarding the theoretical literature relating to self-regulated learning and the flipped learning model. This included searches for classic fundamental theoretical works such as Bandura’s (1991) social cognitive theory and Zimmerman’s (2000) and Pintrich’s (1991; 2004) self-regulated learning models. This stage of the review also included recent critical analyses of key theories and models, as well as relevant meta-analyses or systematic reviews which have examined previous research on self-regulated learning or the flipped learning model. This stage of the review provided a comprehensive background of theoretical approaches and existing knowledge in relation to these concepts. This facilitated an informed critique of the evidence-based studies included in the systematic review; enabled the identification of research gaps or inconsistencies in the literature of this topic research; and assisted in the formulation of a suitable theoretical model, research questions, and hypotheses for the current study.

The second part of the literature review (section 2.6) presents the findings of a more tightly focused systematic review of existing, albeit limited, empirical research relating to the use of self-regulated learning by students within flipped learning environments. This was important to ensure that the present study builds on the existing research-based evidence on self-regulated learning in this context, and to ensure that the findings of the present study can be compared and contrasted with those of other researchers. This review was restricted to peer reviewed journal papers published in English language journals between 2006 and 2016. The specific search methods, selection and filtering
criteria, and data extraction methods used to formulate the conclusions of the systematic review about the impact of the flipped learning model on higher education students’ self-regulated learning strategies are discussed further in section 2.7 (Cronin et al., 2008; Moher, Liberati, Tetzlaff, & Altman, 2010).

2.3 Self-Regulated Learning

2.3.1 Theoretical origins

Theories of self-regulated learning are based on certain philosophical assumptions about how individuals learn (Endedijk, Vermunt, Verloop, & Brekelmans, 2012) and are rooted in the belief that humans have the capacity to control their own emotions, cognition, and behaviour. Although the specific concept of self-regulated learning produced by educational psychologists emerged in literature only in the past three decades, the importance of independent learning skills as an essential aspect of acquiring knowledge has long been recognised in history. For example, the idea was put forward by philosophers such as Jean-Jacques Rousseau during the Enlightenment in the 18th century, and taken up by 19th and early 20th century visionaries such as Maria Montessori and John Dewey (Goetz, Nett, & Hall, 2013).

As Goetz et al. (2013) highlighted, although the importance of self-regulated learning has long been recognised, more in-depth and systematic research into this concept has been conducted only fairly recently. As a fundamental aspect of tertiary education, learning how to independently plan, monitor, and evaluate one’s learning has received considerable attention in educational psychology and related research in the last three decades (Azevedo, 2009). In their critical analysis of conceptual models of self-regulated learning, Jakešová and Kalenda (2015) argued that this concept has theoretical foundations spanning philosophy, sociology, and psychology, including, for example,
phenomenology, constructivism, and socio-cognitive theory. The following subsections describe the main theories and theoretical concepts identified in the literature as being most relevant to self-regulated learning models.

2.3.1.1 Bandura’s social cognitive theory

Albert Bandura’s social cognitive theory is a constructivist theory that is widely considered to be the main origin of leading self-regulated learning models. In his article, “The Social Cognitive Theory of Self-Regulation” (1991), Bandura presented the self-regulatory system as lying at the heart of causal processes. The major self-regulative mechanisms of human behaviour identified in Bandura’s social cognitive theory consist of: self-monitoring of one’s behaviour, its determinants, and its effects; judgment of one’s behaviours in relation to personal standards and environmental circumstances; and affective self-regulation (Bandura, 1991). From this multifaceted perspective, Bandura considered human functioning to be “regulated by an interplay of self-generated and external sources of influence” (1991, p. 249). The whole process operates through the orchestration of other underlying cognitive processes, including self-monitoring, standard setting, evaluative judgment, self-appraisal, and affective self-reaction (Bandura, 1991). This so-called “triadic reciprocal causation” is the origin of other theoretical models of self-regulated learning, such as Pintrich’s general framework for self-regulated learning (1991) and Zimmerman’s social cognitive model of self-regulation (2000).

In his paper, “Reflections on Human Agency: Part II” (1996), Bandura extended the meaning of social cognitive theory and human agency. He explained human agency as one operating in a transaction between the self and society, where personal factors (such as cognitive, affective, and biological events), behaviour, and environmental influences all interact and influence one other (Bandura, 1996). As Puustinen and Pulkkinen (2001) reported, self-regulation applies to many different areas of behaviour, including learning.
Explained in terms of Bandura’s social cognitive theory, the use of self-regulation is essential for learners to control their cognition, motivation, and behaviour in order to achieve their learning goals (Balapumi et al., 2016).

2.3.1.2 Other relevant theoretical concepts

The review of literature revealed other concepts that overlap to some extent with self-regulated learning. For example, Zhu, Au, and Yates (2016) discussed the similarities and differences between self-regulated learning and the concept of self-control, with the latter term referring to one’s ability to make plans and carry them out by facing up to challenges and difficulties. This concept comprises aspects such as using long-term thinking, resisting temptations, and controlling one’s emotional impulses, while self-regulation involves control over oneself by using effective strategies and striving to meet one’s personal standards. However, the authors identify a distinction between the two terms in that self-control relates more to the personality traits needed to achieve long-term goals, whereas self-regulation refers to the current behaviours used in order to keep on track.

Another important related term is self-directed learning. This was coined by the adult education theorist, Malcolm Knowles, in 1975. He defined self-directed learning as “a process in which individuals take the initiative, with or without the help from others, in diagnosing their learning needs, formulating goals, identifying human and material resources, choosing and implementing appropriate learning strategies, and evaluating learning outcomes” (as cited in Loyens, Magda, & Rikers, 2008, p. 18). This concept looks at learning with a broader and holistic approach, but also stresses the importance of the individual’s cognitive, affective, and behavioural characteristics in directing his or her own learning process. Also, the “degree of control” one has may be placed on a continuum, along with the skills necessary to be an effective learner (Loyens et al., 2008).
In their attempt to offer a pedagogical rationale for the relatively new concept of the flipped learning model, Abeysekera and Dawson (2014) draw on two other theories from the psychology literature that they perceive as being closely related to self-regulated learning. These are self-determination theory and cognitive load theory. Developed by Deci and Ryan (1985), self-determination theory regards students’ level of motivation as an outcome of their learning environment, which can act either as a facilitator of, or a barrier to, the satisfaction of cognitive needs. Within the theory, these needs are defined as: competence (to master useful knowledge), autonomy (being in control and independent), and relatedness (belonging to a social group in a given social context) (cited in Abeysekera & Dawson, 2015). Cognitive load theory asserts that individuals only have a limited amount of working memory for use when learning something new or solving a problem. George Miller formulated this theory in the 1950s based on evidence about the limitations of our working memory (cited in Abeysekera & Dawson, 2015). Proponents of cognitive load theory argue that by understanding the limitations of working memory, and how different types of cognitive load can facilitate or reduce learning time, learning environments can be designed to promote independent, self-regulated learning (Abeysekera & Dawson, 2014).

2.3.2 Models of self-regulated learning

A number of different models of self-regulated learning have been formulated that draw on various theoretical perspectives and define self-regulated learning in different ways. Many of these emerged in the mid-1980s to address the question of how students become “masters of their own learning processes” (Zimmerman, 2001, p. 1). Goetz et al. (2013) identified 11 of the best established models of self-regulated learning; they categorised nine of these as process-focused and two as hierarchy-focused. (In hierarchy-focused models, psychological constructs are located on different levels in a given
hierarchy, with higher-level constructs impacting on lower-level ones. In process-focused models, constructs are arranged in an unfolding temporal sequence with specific processes occurring during specific phases.) These models are listed in Table 2-1, which also identifies their main foci (either process-focused or hierarchy-focused).

### Table 2:1 Theoretical Models of Self-Regulated Learning

<table>
<thead>
<tr>
<th>Model and author</th>
<th>Main focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>General cybernetic model of regulation (Wiener, 1948)</td>
<td>Process</td>
</tr>
<tr>
<td>Zimmerman’s social cognitive model of self-regulation (Zimmerman, 1989, 2000a)</td>
<td>Process</td>
</tr>
<tr>
<td>Model of external- and self-regulated learning (Schiefele &amp; Pekrun, 1996)</td>
<td>Process</td>
</tr>
<tr>
<td>Three-layered model of self-regulated learning (Boekaerts, 1999)</td>
<td>Hierarchy</td>
</tr>
<tr>
<td>Model of adaptable learning (Boekaerts &amp; Niemivirta, 2000)</td>
<td>Process</td>
</tr>
<tr>
<td>Process-oriented model of metacognition (Borkowski, 1996; Borkowski, Chan, &amp; Muthukrishna, 2000)</td>
<td>Process</td>
</tr>
<tr>
<td>Process-oriented self-regulated learning model (Schmitz, 2001)</td>
<td>Process</td>
</tr>
<tr>
<td>Dual processing self-regulation model (Boekaerts &amp; Corno, 2005)</td>
<td>Process</td>
</tr>
</tbody>
</table>

Although other authors (e.g., Azevedo, Moos, Greene, Winters, & Cromley, 2008; Boekaerts & Corno, 2005; Schunk, 2005; Winters, Greene, & Costich, 2008) have also contributed significantly to research and theory development in the area of self-regulated learning, this review gives attention to the five leading theoretical models in Table 2-1 (identified below), but devotes the most attention to Pintrich’s general framework for self-regulated learning (2004), which is deemed to be the most appropriate theoretical framework for the present study. The five models reviewed in this chapter are selected because, according to Puustinen and Pulkkinen (2001), they have proved to provide the most adequate theoretical and empirical grounding. These models are:
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- Borkowski’s (1996) process-oriented model of metacognition;
- Winne & Hadwin’s (1998) four-stage model of self-regulated learning;
- Boekaerts & Niemivirta’s (2000) model of adaptable learning;
- Zimmerman’s (2000b; Zimmerman & Campillo, 2003; Zimmerman & Moylan, 2009) cyclical phase model of self-regulated learning; and

The first four models provide a broad understanding of how self-regulated learning has been conceptualised by previous researchers, and they are presented first. Thereafter, Pintrich’s (2000) general framework will be elaborated. As will become evident, although the other models provide useful insights, they are not as comprehensive as Pintrich’s; nor are they (with the possible exception of Zimmerman’s) as solidly based on a well-developed and empirically supported psycho-social theory—namely, Bandura’s (1991) social cognitive theory.

2.3.2.1 Process-oriented model of metacognition (Borkowski, 1996)

Borkowski (1996) defined an effective learning and information processing strategy in terms of the successful integration of cognitive, motivational, personal, and situational components. Borkowski’s model was developed to explain the emergence of self-regulated learning among learners, and it identifies the stages in this process. These range from the learners initially being taught to use a learning strategy, through the learners applying multiple strategies in diverse contexts, to the learners continuing to evolve as they become able to choose appropriate strategies and monitor their own performance. In this model, the self-regulation process is conceptualised to begin with the use of lower-level cognitive skills level, and to invoke positive motivational states as it evolves over time (Puustinen & Pulkkinen, 2001).
2.3.2.2 Four-stage model of self-regulated learning (Winne & Hadwin, 1998)

These authors defined self-regulated learning as both an aptitude (a stable personal attribute) and an event (a transient state included in a longer series of unfolding states) (Puustinen & Pulkkinen, 2001). Self-regulated learning is conceptualised as an inherent part of learning—a metacognitively-guided behaviour that enables students to adapt their cognitive tactics and strategies to meet the requirements of a task. This adaptive regulation process involves four stages: task definition, goal setting, tactics and strategies enacted, and critically examining the learning process for future adaptation. Each stage, according to the model, shares a similar structure consisting of five elements: (a) conditions (information about the task circumstances); (b) operations (cognitive processes, tactics, and strategies enacted), (c) products (information created by operations in transforming conditions; these can be internal or external, behavioural); (d) evaluations (internal or external feedback about the products); and (e) standards (criteria used to monitor the products.) Winne & Hadwin (1998) considered self-regulated learning to be a recursive process due to the continual modifications to conditions that result from the products of earlier stages. Since contextual information influences students’ perceptions of a task, this can generate different learning process patterns for different learners (Puustinen & Pulkkinen, 2001).

2.3.2.3 Model of adaptable learning (Boekaerts & Niemivirta, 2000)

This model built on an earlier theoretical model developed by Boekaerts (1999), in which appraisal was seen to be at the centre of the self-regulated learning process. Three kinds of information were assumed to influence appraisal—perception of the learning situation, domain-specific metacognitive knowledge, and self-system—along with the associated motivational factors (Puustinen & Pulkkinen, 2001). The positive appraisal a teacher gives to a student is assumed to generate more knowledge acquisition and the
expansion of a student’s personal resources. Conversely, negative appraisal leads to the ego protection that a student activates in order to protect his or her personal resources and wellbeing. Self-regulated learning is conceptualised in this model in terms of achieving the right balance between these two mechanisms (Puustinen & Pulkkinen, 2001).

The revised model of adaptable learning, as developed by Boekaerts and Niemivirta (2000), emphasises the non-unitary character of the self-regulated learning process and the distinction between optimal and non-optimal conditions for the occurrence of self-regulated learning. Optimal conditions are achieved by matching the learning opportunity with the perceived need of the student to be involved in this. A number of steps in this process are identified: first, the identification, interpretation, and appraisal of the learning situation; then, goal setting; and, eventually, goal striving, including a feedback loop relating to the learner’s metacognitive and motivational components. Boekaerts and Niemivirta (2000) also identified two distinct patterns of action that are involved in self-regulated learning: one is a fast, automatic processing pattern, starting with situation identification and going directly to goal striving; the other is a pattern applied to learning situations demanding higher levels of consciousness and deliberation. The authors emphasised that self-regulated learning is not necessarily a linear process, since students are able to return to a previous phase or bypass phases.

2.3.2.4 Zimmerman’s models of self-regulated learning (Zimmerman, 1989, 2000a; Zimmerman, 2000b; Zimmerman & Campillo, 2003; Zimmerman & Moylan, 2009)

Zimmerman and his colleagues formulated several theoretical models of the self-regulated learning process, including the social cognitive model of self-regulation (Zimmerman, 1989, 2000a) and the cyclical phase model (Zimmerman, 2000b; Zimmerman & Campillo, 2003; Zimmerman & Moylan, 2009). As the name indicates, the social cognitive model of self-regulation is based on Bandura’s (1991) social
cognitive theory. Zimmerman and his collaborators saw self-regulated learning as being determined by three distinct yet interdependent factors: personal, behavioural, and environmental influencing elements (Puustinen & Pulkkinen, 2001). In a later development, Zimmerman (2000b) argued that self-regulation has a cyclical nature. Learning goals and strategies are continually adjusted in response to the feedback obtained from previous learning experiences, and to realign learning with the constantly changing wider factors influencing the learning process. The cyclical phase model—revised in collaboration with Campillo in 2003 (see Zimmerman & Campillo, 2003), and with Moylan in 2009 (see Zimmerman & Moylan, 2009)—covers cognitive, behavioural, and motivational elements, and explains in great detail the motivation–self-regulation relationship (Puustinen & Pulkkinen, 2001). The model has three phases: forethought, performance, and self-reflection. The forethought phase refers to actions, preparations, and other similar processes preceding task analysis or self-motivation. The performance phase relates to volition and consists of two processes: self-control and self-observation. The self-reflection phase involves the processes of self-observation (or self-judgment) and self-reaction. Due to its nature, this phase further influences forethought processes and stimulates the cyclical mechanisms of self-regulation (Puustinen & Pulkkinen, 2001).

2.3.3 Basis for the selection of Pintrich’s self-regulated learning model

As an examination of the above four models suggests, self-regulated learning is a process in which students manage their thoughts, emotions, and behaviours in order to attain successful learning outcomes (Balapumi et al., 2016). The models also indicate that students do this by taking into consideration the context of learning, and by selecting appropriate strategies through an iterative process of continuous improvement. All of the above models are valuable in these respects. As to how to choose between these models
(as must be done in this thesis for reasons of tractability), one may look to empirical
evaluation and to conceptual evaluation.

Unfortunately, there has been no comprehensive attempt to systematically empirically
compare all of the above models against each other in terms of validation and impact on
student learning outcomes. Empirical investigations of models have mostly been focused
on particular aspects of individual models in specific contexts. To date, there have been
three meta-analyses of SRL effects (Dignath & Büttner, 2008; Dignath et al., 2008;
Sitzmann & Ely, 2011). It transpires there is a significant overlap in the empirical
evidence for each model, so no clear verdicts have been or can be reached vis-à-vis
competing models at this stage. In order to judge and choose between the different
models then, one must fall back on a conceptual evaluation of the models. In this respect,
I believe that Pintrich’s model is superior overall (which is not to say, of course, that it is
perfect).

The first thing to say about Pintrich’s model is that despite the originator’s untimely
death which cut short any developments he may have made to it, the model has proved to
be extremely popular and widely used compared to the other models. Dignath et al.
(2008) suggests a couple of reasons for this success that speak to the superiority of
Pintrich’s model. One reason is that Pintrich’s model is easier to understand and apply
than other models, such as Boekaerts and Niemivirta’s (2000) and Winne and Hadwin’s
(1998), which require a more in-depth knowledge of the psychological theories upon
which they are based. Furthermore, the Motivated Strategies for Learning Questionnaire
(MSLQ) which is based on Pintrich’s initial approach, has been empirically validated and
is very widely used in empirical investigations of self-regulated learning (Roth et al.,
A second reason for the widespread use of Pintrich’s model is that it offers a very comprehensive set of processes. Very briefly, Pintrich’s (2000) model is composed of four phases: (1) fore-thought, planning and activation; (2) monitoring; (3) control; and (4) reaction and reflection. Each phase four different areas for regulation: (i) cognition, (ii) motivation and affect, (iii) behaviour and (iv) context. The combination of the four phases and the four areas generates a comprehensive matrix of self-regulated learning processes. Because this model is so comprehensive, it incorporates and integrates the insights that are emphasised in the other models. So rather than critique the other models, a more positive way of indicating the greater overall value of Pintrich’s model to the present study is to indicate how this model incorporates the most important aspects of rival models.

With respect to area (i), cognition, Pintrich’s model incorporates what other models such as Borkowski’s (1996) and Winne and Hadwin’s (1998) call metacognition (e.g., students’ evaluation of learning and their sense of knowing). With respect to area (ii) motivation and affect, Winne and Hadwin’s (1998) model does not deal with this area directly; by contrast, Boekaerts and Niemivirta (2000) and Boekaerts (2011) make these of central importance, sometimes being negative (such as for ego-protection). Pintrich however, walks a middle-path, arguing that motivation and affect can be cognitively regulated by students to enable positive learning experiences. Pintrich emphasises controlling the emotional reactions arising when students evaluate their work, but also students monitoring and controlling emotions during the performance of tasks.

With respect to area (iii), behaviour, Pintrich builds upon the theoretical foundations laid by Bandura (1986, 1991, 1996, 1999), which deals with students’ attempts to control their own overt behaviour. By identifying this area of self-regulation, Pintrich’s model is unique because no other model deals explicitly with this area. Finally, with respect to area
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(iv), context, this is a feature of, e.g., Winne and Hadwin’s (1998) model (called ‘conditions’) and Boekaerts and Niemivirta (2000) model, however, these models seem to take the learning context as a fixed ‘given’ to which students must learn to adapt, whereas in Pintrich’s model, students are treated as potential managers of the context – they may be able to develop strategies to monitor, control and regulate the context.

In sum, Pintrich’s model is a comprehensive and intuitive model that incorporates and gives fairly equal weight to all the salient features of the other models without ignoring any particular variable that is deemed important in the literature. The other models are not as comprehensive, or tend to give more emphasis to one area over others. Thus, Pintrich’s model has been selected as being most suitable for the present study.

2.3.4 Details of Pintrich’s self-regulated learning model

Described by Schunk (2005) as a leading figure in the field of self-regulated learning, Pintrich’s contributions to this area include: the development of a conceptual framework for studying self-regulated learning; the identification of the important role of motivation in self-regulation; his interventions to enhance self-regulatory processes; his exploration of the impact of the school context on self-regulated learning; and the development of the widely used MSLQ (Schunk, 2005).

Pintrich (2000) described self-regulated learning as “an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features in the environment” (p. 453). The general framework model for self-regulated learning (McKeachie, Pintrich, Lin, & Smith, 1986), which has been modified and transformed multiple times since its original formulation, has always retained a focus on integrating motivational constructs within self-regulated learning (Puustinen & Pulkkinen, 2001).
In its 2004 iteration, Pintrich’s general framework consists of a conceptual matrix in which four areas of regulation correspond with four phases of self-regulated learning, as set out in Table 2-2. The phases are: (1) forethought, planning, and activation; (2) monitoring; (3) control; and (4) reaction and reflection. The four areas of regulation are: (i) cognition, (ii) motivation/affect, (iii) behaviour, and (iv) context. The MSLQ scales are aligned with these elements in the four phases and four areas of the general framework matrix (Pintrich, 2004, p. 390). As can be seen from Table 2-2, this generates a complex set of variables impacting on self-regulated learning.
Table 2:2 Pintrich’s general framework of self-regulated learning matrix

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<tbody>
<tr>
<td>1. Forethought, planning, and activation</td>
<td>Target goal setting</td>
<td>Goal orientation adoption</td>
<td>Time and effort planning</td>
<td>Perceptions of task</td>
<td>Perceptions of context</td>
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<tr>
<td></td>
<td>Prior content knowledge</td>
<td>Efficacy judgments</td>
<td>Planning for self-observations of behaviour</td>
<td></td>
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<tr>
<td></td>
<td>activation</td>
<td>Perceptions of task difficulty</td>
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<td></td>
<td>Metacognitive knowledge</td>
<td>Task value activation</td>
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<td></td>
<td>activation</td>
<td>Interest activation</td>
<td></td>
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<tr>
<td>2. Monitoring</td>
<td>Metacognitive awareness</td>
<td>Awareness and monitoring of motivation and affect</td>
<td>Awareness and monitoring of effort, time use, need for help</td>
<td>Monitoring changing task and context conditions</td>
<td>Self-observation of behaviour</td>
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<tr>
<td></td>
<td>and monitoring of cognition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Control</td>
<td>Selection and adaptation of</td>
<td>Selection and adaptation of strategies for managing,</td>
<td>Increase/decrease effort</td>
<td>Change or renegotiate task</td>
<td>Change or leave context.</td>
</tr>
<tr>
<td></td>
<td>cognitive strategies for</td>
<td>motivation, and affect</td>
<td>Persist, give up</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>learning, thinking</td>
<td></td>
<td>Help-seeking behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Reaction and reflection</td>
<td>Cognitive judgments</td>
<td>Affective reactions</td>
<td>Choice behaviour</td>
<td>Evaluation of task</td>
<td></td>
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</table>

These variables generated by the matrix can be then grouped into three component-elements to give a tractable structure to the strategies used in self-regulated learning (Pintrich, 2000, 2004; Pintrich et al. 1991). These elements are: (1) motivational strategies, (2) learning strategies, and (3) resource management strategies. The following subsections discuss each of these elements in turn.

2.3.4.1 Element 1: Motivational strategies

This element of the framework has three main parts: a value component, an expectancy component, and an affective component. Each of these in turn has a number of different dimensions.

The value component covers the goal orientation of the learner, or their perceived reason for being engaged in a learning task, which is subdivided into the binary of intrinsic goal orientation and extrinsic goal orientation. Learners with an intrinsic goal orientation see assigned tasks as ends-in-themselves rather than means to an end, and are motivated by their interest in tasks themselves or by their desire to challenge or master tasks. In contrast, learners with an extrinsic goal orientation are motivated primarily by the rewards that they perceive to be forthcoming if they complete assigned tasks successfully, such as academic grades or qualifications, assessment by others, or the personal satisfaction derived from outperforming their peers. The value component of the motivational strategies element of the framework also includes task value, or the learner’s perception of how interesting or useful completion of a particular learning task is to them personally. According to the theoretical framework, higher perceived task value should lead to more involvement in one’s learning.

The expectancy component has two main dimensions: control of learning beliefs and self-efficacy for learning and performance. These relate to the learner’s beliefs regarding
their own learning abilities and the level of control they hold over the outcomes of their learning. Specifically, *control of learning beliefs* refers to the extent to which students perceive that the outcomes of learning, such as academic grades, accurately reflect their actual effort and abilities, rather than other factors, such as the subjective views of teachers. Self-efficacy for learning and performance has two aspects: *expectancy for success*, which refers to the learner’s expectations about their performance in a particular task; and *self-efficacy*, which relates to the learner’s perception of their ability to accomplish the task and confidence in their ability to demonstrate the necessary skills to do so.

Finally, the affective component of the motivational strategies element of the framework has just a single dimension: task anxiety. However, this is broken down into a cognitive component defined as *worry*, or the negative thoughts that can affect learning performance, and an *emotionality component*, relating to the affective and physiological impacts of anxiety on a learner which can affect their performance.

### 2.3.4.2 Element 2: Learning strategies

The second element of Pintrich’s (1991; 2004) framework consists of five “cognitive and metacognitive learning strategies” defined as: *rehearsal, elaboration, organisation, critical thinking, and metacognitive self-regulation*. These all relate to various methods and techniques that learners can use to enhance their learning.

Rehearsal is a basic strategy in which items to be learned are recited or named in a repetitive manner; it is used mainly for simple tasks and storing information in the working memory.

Elaboration refers to the ways in which learners make connections between various pieces of information in order to enhance their understanding and move the information
into long-term memory. The framework gives examples of elaboration strategies such as *paraphrasing, summarising, creating analogies, and generative note-taking.*

Organisation refers to the ways in which a learner actively selects relevant information and constructs connections within it. Examples of specific organisational learning strategies are clustering, outlining, and selecting the main ideas when reading text.

Critical thinking is defined in the framework (Pintrich, 2004; Pintrich et al. 1991) as the extent to which learners draw on their existing or previous knowledge and apply this to new problem solving, decision-making, or the critical evaluation of new information.

The fifth component of the learning strategies element is metacognitive self-regulation. Pintrich defined metacognition as having “awareness, knowledge and control of cognition” (1991, p. 23) and this component of the framework focuses on the knowledge and control aspects of the concept. In particular, Pintrich (1991; 2004) identified three processes of metacognitive self-regulatory activities: *planning, monitoring,* and *regulating.* He described planning as setting goals and analysing the requirements of tasks; he explained monitoring by use of examples such as tracking one’s attention and self-questioning or self-testing; and he referred to regulating as the activities involved in adjusting or fine-tuning cognitive activities during learning.

2.3.4.3 Element 3: Resource management strategies

The third element of Pintrich’s (1991; 2004) framework consists of four resource management strategies relating to: the learner’s management of his or her *time and study environment,* the learner’s own *effort regulation,* the learner’s use of *peer learning* and the learner’s *help seeking.* This element of the framework reflects the importance of effectively managing the various types of resources available to learners, as well as their own cognition.
Pintrich (1991) explained that time management includes setting aside time to study, setting realistic goals for that time, and making effective use of the time available. The importance of managing the study environment is also highlighted in the framework, which specifies that this should ideally be well organised, quiet, and free from distractions.

Regulating one’s own efforts is the second component of the resource management element of the framework, and refers to the ability of a learner to control his or her effort and attention even in the face of distractions. The final two components of this element of the model—peer learning and help seeking—represent the ways in which a learner uses other people as resources in the learning process. It is noted that collaborating with peers can have positive impacts on achievement, and that effective learners know when they need help to understand something and can identify the right person to assist them.

Having described Pintrich’s self-regulated learning framework as well as other important theories of self-regulated learning, the first part of the review of literature relating to self-regulated learning concludes in the next section by examining research that has explored the use of this practice among university students.

2.3.5 University students’ self-regulation of learning

Many authors have stressed the importance of self-regulation of learning in the tertiary education sector (e.g., Balapumi et al., 2016; Cassidy, 2011; de Boer et al., 2013; Dresel et al., 2015; Roth et al., 2016). As suggested by the theories of self-regulated learning examined in previous sections, university students need specific skills, such as the ability to independently plan, monitor, and evaluate their own learning, in order to support their cognition, positive motivation, and behaviour in pursuing their academic and professional goals (Balapumi et al., 2016).
The review of literature revealed that many previous research studies have examined self-regulated learning competencies among university students. For example, Roth et al. (2016) conducted a systematic review and identified more than 632 articles in this area published between 1988 and 2013. Although the majority used quantitative methods to analyse self-reported data on self-regulated learning, some were based on qualitative techniques for investigating self-regulated learning. Roth et al. (2016) observed, however, that although most of the researchers claimed to assess self-regulated learning strategies and behaviour, in fact many were actually measuring knowledge, aptitude, and motivational states rather than self-regulated learning itself (Roth et al., 2016).

Addressing an identified need for more research on the underlying competencies that contribute to effective self-regulated learning, Dresel et al. (2015) conducted semi-structured interviews with 108 “experts”, consisting of lecturers and exemplary students from four fields of study. They used the findings to develop a structural model that identified self-regulated learning competencies in terms of descriptive, procedural, and conditional knowledge about different types of self-regulation strategies and in different phases of the learning process. Dresel et al. (2015) found that within a higher education context, students use self-regulated learning not only in classical self-regulation situations, but also for preparation of complex study tasks and even course attendance. They reported that the experts particularly emphasised the necessity of resource management (with motivational regulation having a pivotal role) and highlighted the importance of self-regulated learning strategies in the pre-action and action phases of learning (Dresel et al., 2015). A further interesting finding of their study is that a good fit between self-regulated learning strategy use and situational demands is judged to be more effective than a maximum intensity of strategy use. The authors concluded that more
training for scaffolding students’ self-regulated learning should be provided, either informally in regular course settings or in more formal dedicated programs.

This finding is especially important because researchers have found that many students arrive at universities without the skills needed for self-regulated learning (Balapumi et al., 2016; Cassidy, 2011; Roth et al., 2016). Moreover, it has been observed that appropriate training or other resources to help them develop these self-regulation abilities are often lacking (Cassidy, 2011; de Boer et al., 2013; Endedijk et al., 2014; Hattie et al., 1996). As de Boer et al. (2013) found when conducting a meta-analysis of effective strategies for self-regulated learning, university students and other adults are least likely to receive instruction in self-regulated learning strategy, with this instruction offered mainly on upper secondary students. This finding was similar to that reported by Hattie et al. (1996). De Boer et al. (2013) concluded that without strategy instruction, students were unlikely to develop effective learning strategies on their own—a finding supported by the work of Balapumi et al. (2016). These authors found that undergraduate students often fail to develop and sustain the appropriate cognitive and motivational strategies to regulate their learning, which results in inappropriate planning and goal setting and, ultimately, an inability to effectively self-regulate learning, despite their high intelligence, aspirations, or prior knowledge and academic performance (Balapumi et al., 2016). They recommended additional research in this area as well as practical measures to help fill the gap in self-regulated learning instruction for university students (Balapumi et al., 2016).

In this context, Cassidy (2011) set out a number of research-based recommendations about policy and practice for higher education institutions in order to develop their students’ self-regulated learning capacity. In particular, Cassidy highlighted the need to support students in developing learning strategies, developing positive self-efficacy, and
setting and pursuing meaningful goals, and to introduce more curricular activities focused on the development of cognitive skills and metacognitive skills. Cassidy (2011) also stressed the importance of establishing an environment conducive to self-regulated learning, taking account of the physical setting, resources provided, and the need for appropriate social interactions, and emphasised the role of ICT as a tool to support university-level self-regulated learning. Cassidy (2011) also recommended future research to investigate students’ learning styles, academic control beliefs, and self-evaluation abilities. Balapumi et al. (2016), on the other hand, emphasised the need for future research into the factors that influence students’ motives for studying.

2.4 Flipped Learning

2.4.1 Origins and definition of flipped learning

The review of literature revealed two main origins of the *flipped or inverted learning* approach. The first consists of the new educational approaches that promote a more active role for the learner in the educational setting. These approaches are often social constructivist in nature, and have been referred to in terms such as student-centred learning, active learning, project-based or problem-based learning, and collaborative learning through communities of practice, as well as self-regulated, self-determined, and self-directed learning. The second origin consists of the resource management trends in education, including distance learning, computer-based learning environments, hypermedia-learning environments, e-learning or online learning, and blended learning.

Green (2015) discussed the influence that *social constructivism* has had on the development of the flipped learning model. This approach emphasises the importance of shifting the nature of the student and teacher roles within the educational setting, so that the student is seen as an active agent, involved in a series of hands-on, collaborative
activities, while the teacher plays a facilitative, rather than an instructive, role (Green, 2015). Sankey and Hunt (2014) reinforced this point by presenting three flipped learning cases informed by the constructivist pedagogy in which the learner, rather than the teacher, is seen as the creator of understanding.

Green (2015) also recommended that the flipped learning approach should incorporate the zone of proximal development concept, derived from Vygotsky’s (1978) social constructivist theory of learning. This concept acknowledges the differences in the abilities of students to learn independently, and in what they can achieve when provided with guidance and help from teachers or peers. Green (2015) argued that this requires the use of scaffolding measures, including supporting resources and assistance, to enable students to bridge the learning distance between what is known and what is unfamiliar in terms of course content. Green (2015) also recommended taking into account the communities of practice theoretical construct, initially formulated by Lave and Wenger (1991) in the context of their discussion of situated learning, as an extension of our understanding about social learning systems. This theory proposes a model for creating engagement as a substratum for optimising students’ learning outcomes, a model of collaborative learning that could also work well in education with the help of online technologies (Green, 2015).

Other theoretical perspectives have also influenced the development of the flipped learning approach and the research being conducted in this area. These perspectives include, for example, the model formulated by Abeysekera and Dawson (2014) to convey the influence that the flipped learning model can have on motivation and cognitive load, which they recommended for further investigation using empirical research. The model has two specific layers of outcomes that can be influenced by a flipped learning approach. The first layer consists of two parts: one including the three basic cognitive needs of
learners as defined by the self-determination theory (the sense of competence, the sense of relatedness, and the sense of autonomy); the other including two distinct aspects of the learning process, namely tailoring to expertise and self-pacing. The second layer of the model refers to the ultimate outcomes that a flipped learning experience may yield—that is, increased motivation (both extrinsic and intrinsic) and better management of one’s cognitive load (Abeysekera & Dawson, 2014).

Often regarded as the origin of the flipped or inverted classroom theoretical concept, the article of Lage, Platt, and Treglia (2000) “Inverting the Classroom: A Gateway to Creating an Inclusive Learning Environment”, also referred to the new learning opportunities that technological advances bring to students. The authors stated that, overall, the “general principle is to provide a menu of options for the students to use in learning” (Lage et al., 2000 p. 32). The authors also emphasised that instructors are able to focus on the desired outcomes while allowing students to select the best method for them personally to use in reaching those outcomes (Lage et al., 2000).

The terms flipped classroom and flipped learning became popular a little later, largely in connection with the opening of the Khan Academy around 2006, and in 2010 when that organisation received support from Microsoft to create a digital video learning library for K–12 students (Hao & Lee, 2016). Soon after, as Abeysekera and Dawson (2014) observed, popular use of the terms “flipped learning” and “the flipped classroom” grew exponentially. Flipped learning is also often referred to by other terms, including the inverted classroom, reversed instruction, and blended learning, as noted by Bergmann and Sams (2012) and Hao and Lee (2016).

Although the academic literature lacks a single, agreed-upon definition of flipped learning, Jensen et al. (2015) have offered a short and fairly uncontroversial definition: “a learning model in which content attainment is shifted forward to outside of class, and then
followed by instructor-facilitated concept application activities in class” (p. 1). The brevity of this definition rendered it somehow vague, however. A more elaborate definition of flipped learning has been offered by Abeysekera and Dawson (2014), who argued that a number of common features of the flipped learning model can be identified as definitional. Specifically, the model consists of a set of pedagogical methods that: (a) move most information-transmission teaching out of class; (b) use class time for learning activities that are active and social; and (c) require students to complete pre- and/or post-class activities to fully benefit from in-class work (p. 3). This is the definition that will be adhered to in the present study because it incorporates the essential common elements in the various approaches, as mentioned below. Terms such as “flipped learning environment” and “flipped learning approach” will be treated as synonyms for “flipped learning model”. The terms “flipped learning classroom” and “flipped classroom” will synonymously refer to the face-to-face (on-campus) learning space in which pedagogical activities informed by the flipped learning model are conducted.

2.4.2 Approaches to flipped learning

Various approaches to flipped learning have been developed during the last few years. A number of the leading models are summarised in Table 2-3. As Chen et al. (2014) reported in their brief review of existing flipped approaches, each has a different focus, including content delivery, learning cycles, or the weight of physical versus virtual learning environments.

Flipped learning models adapted specifically for the higher education setting have also recently been developed. For example, Chen et al. (2014) proposed a modification to Hamdan et al.’s (2013) F-L-I-P model. The model developed by Chen et al. (2014) incorporates into the original name three additional letters, P-E-D, representing Progressive Networking Activity, Engaging and Effective Learning Experiences, and
Diversified and Seamless Platforms. In this way, the new model is presented by using “F-L-I-P-P-E-D” as an acronym (Chen et al., 2014).

Table 2.3 Practice models of flipped learning

<table>
<thead>
<tr>
<th>Approach and author</th>
<th>Main elements</th>
<th>Focus</th>
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| Flipped mastery model (Bergmann & Sams, 2012) | Clear learning objective  
Grouping learning objectives depending on most suitable learning method  
Student access to videos  
Incorporating engaging in-class learning activities  
Creating multiple versions of each summative assessment | Content delivery |
| Flipped classroom model (Gerstein, 2012) | Experiential engagement  
Concept exploration  
Personalisation and meaning making  
Demonstration and application | Learning cycles |
| Staker and Horn’s models (2012) | Practice and projects at school  
Online instruction and content at home | The weight of physical and virtual learning |
| F-L-I-P schema (The Flipped Learning Network and Pearson’s School Achievement Services) (Hamdan et al., 2013) | (F) Flexible Environment, (L) Learning Culture, (I) Intentional Content, and (P) Professional Educators | Student’s engagement and support |

2.4.3 Empirical studies on the benefits of flipped learning

In a content analysis of 20 refereed journal articles on the flipped learning model published from 2013 to 2015, Zainuddin and Halili (2016) found that courses from a large variety of fields were being taught using the flipped learning model and multiple online tools. Also, these courses were reported to be associated with positive impacts on aspects of students’ learning such as achievement, motivation, engagement, and interaction. However, in the case of some of the initiatives covered by the review, there were problems and challenges relating, for example, to poor quality of video lectures or untrained instructors. The authors concluded that, since the flipped learning trend is growing fast as a contemporary model implemented in teaching-learning activities for
both higher and K–12 education, it should be given more attention and resources from government and policymakers in future.

Several studies have focused on the role of flipped learning in facilitating “active learning”. For example, Jensen et al. (2015) conducted a longitudinal study comparing an active non-flipped classroom with an active flipped classroom. They concluded that “learning gains in either condition are most likely a result of the active-learning style of instruction rather than the order in which the instructor participated in the learning process” (Jensen et al., 2015, p. 1). Using Andrews, Leonard, Colgrove, and Kalinowski's (2011) definition of active learning as what occurs when “an instructor stops lecturing and students work on a question or task designed to help them understand a concept” (p. 394), Abeysekera and Dawson (2014) have claimed that this learning process is actually what the flipped classroom approach facilitates during classroom time. McLaughlin et al. (2014) emphasised that active learning enhances students’ learning outcomes and improves their motivation and attitudes. This coheres with the findings of other researchers (e.g., Abeysekera & Dawson, 2015; Jensen et al., 2015) that the practice of off-loading content and engaging in active learning in the classroom is even more important than the specific methods that teachers use.

Abeysekera and Dawson (2014) identified a number of potential benefits of using a flipped learning model as an active learning strategy in higher education. These included overcoming the learning difficulties that many undergraduate students face when arriving at universities; cultivating conscientiousness, concentration, and a deep approach to learning; and having overall positive impacts on student achievement. However, these authors also identified some potential negative impacts of flipped learning which they argued need to be addressed, such as procrastination or the use of surface-level approaches to learning.
A study conducted by Betihavas et al. (2016) is also relevant to understanding the role of flipped learning in higher education. These authors presented an integrated overview on what student-centredness and self-paced learning really mean for academia, starting with the shift in roles (between teachers and students) and proceeding to the new uses of time and space. They described the transformation in the role of the teacher from being a “facilitator” of knowledge to a “curator” of knowledge; highlighted the diversity of learning styles supported by the new approaches to higher education; and emphasised the need for students to take a more active role and become more accountable for their learning. With all of these developments, Betihavas et al. (2016) observed that “students are well situated to capitalize on flexible, multi-media learning opportunities” and to prepare learning “under their own abilities as well as learn to solve their own problems through the guidance of a teacher and friends who are more competent” (p. 16).

Special attention is given in the literature to the integration of the flipped learning model with Bloom’s hierarchical model of educational learning objectives (especially for the cognitive domain), also known as “Bloom’s Taxonomy” (De George-Walker et al., 2010; Giannakos et al., 2014; McLaughlin et al., 2013; Talbert, 2014a; Zainuddin & Halili, 2016). For example, McLaughlin et al. (2013) pleaded for “more opportunities for students to analyse and synthesize information in the form of short answer, essays, and course projects” in order to develop the critical and other higher-level thinking skills listed in Bloom’s Taxonomy (p. 6).

De George-Walker and Keefe (2010) developed a blended learning course design which is intended to encourage and develop students’ critical thinking capacities. This design was specifically informed by Bloom’s revised taxonomy of educational objectives. As such, the modules of the course were built to guide the learners progressively from lower-order to higher-order thinking skills, focusing first on remembering, understanding,
and applying course content in a basic way, and eventually moving to applying learning in a more sophisticated way, as well as evaluating and creating (De George-Walker et al., 2010).

However, as Talbert (2014) argued, the pairing of cognitive tasks to physical contexts (both inside and outside the class) can pose a number of issues for students. Talbert (2014) noted, for example, that the support received by students is inversely proportional to the difficulty of the cognitive tasks; that they lack control over the information stream when they are in class; and that students who struggle with time management are disadvantaged when confronted with outside-class activities. Moreover, Talbert (2014) argued that higher-level cognitive tasks require longer periods of time to work and reflect upon. Despite these concerns, a review conducted by Giannakos et al. (2014) of more than 30 studies of the flipped learning model showed that flipped learning activities that activated the higher-order thinking processes listed in Bloom’s Taxonomy were considered to be more engaging and affordable by students, due to their flexibility.

2.4.4 The flipped learning model in higher education: Current practices and implications

Zainuddin and Halili’s (2016) conclusions about research and trends in flipped learning are in line with the claims of the NMC Horizon Report (Johnson et al., 2014). This publication referred to the “Increasing Use of Blended Learning Designs” (pp. 18-19) as one of the key trends accelerating technology adoption in higher education in the short term. Based on a meta-analysis of studies on flipped learning models, Rahman et al. (2014) reported that flipped learning initiatives had initially been used mainly in technology and STEM (science, technology, engineering, and mathematics) subject areas, but are now widely utilised in a variety of academic courses.
O’Flaherty and Phillips (2015) conducted a comprehensive review of international literature on the use of the flipped learning model in higher education. They reported that the flipped learning paradigm emerged mainly in K–12 education practice, although many similar initiatives have increased in universities, especially in the last few years. From their analysis of 28 articles from the United States, Australia, the United Kingdom, and Asia, they concluded that there is not yet sufficiently robust evidence to confirm that the flipped learning approach is more effective than conventional teaching methods. They observed, however, that the format and structure of learning materials, and the ways these are integrated into the flipped learning approach, are important contributors to high levels of student satisfaction with flipped learning. O’Flaherty and Phillips (2015) also highlighted the importance of adequate funding to cover the cost of pre-class resources and ongoing information technology (IT) support, as well as providing teachers with training in this new pedagogical approach.

O’Flaherty and Phillips (2015) provided insights into the reasons for the increasing uptake of flipped learning by observing that higher education institutions are facing increased scrutiny to improve student learning and demonstrate program effectiveness. As such, greater attention is being given to student engagement. Further, the flipped learning model offers financial advantages to universities in that it is a means of delivering both cost-effective and student-centred curricula (O’Flaherty & Phillips, 2015). In addition, the use of ICT to enhance students’ experience is increasingly an expectation of the millennial generation that has grown up using computers (O’Flaherty & Phillips, 2015). However, as Lage, Platt, and Treglia (2000) highlighted, technology alone cannot provide effective learning, and a blended approach is therefore more likely to be adopted. Despite the trends observed by other researchers, a brief review of existing flipped models and flipped practice by Chen et al. (2014) concluded that the flipped model is still under-
utilised and under-explored in the higher education context, and that both research and
design models for flipped learning in this sector of education are insufficient.

Despite the apparently relatively limited empirical work on flipped learning, M. Kim
et al. (2014) have developed some common guiding principles for higher education
teachers using flipped learning. These include, for example, providing opportunities for
students to gain initial exposure to learning material prior to class; providing incentives
for students to prepare adequately for class; providing mechanisms for the assessment of
student understanding; and providing clearly defined and well-structured guidance
(M. Kim et al., 2014).

Other recent studies have demonstrated that following these types of principles is well
worth a teacher’s effort. For example, Thai, Wever, and Valcke (2015) conducted
research in one higher education course to test the impact on students’ outcomes of four
different approaches: a flipped classroom design, a blended learning design, a face-to-
face learning setting, and a completely e-learning (online) approach. Their results showed
that students in the flipped learning setting achieved significantly superior learning
outcomes compared with students in the face-to-face setting or the fully e-learning
approach (p. 744). Another study, this one conducted by Şengel (2016), indicated that
student achievements in the form of homework performance and the amount of time spent
on preliminary work before class (watching videos) were significantly higher in the
flipped classroom compared to the traditional teaching one.

Although consistent evidence of improved learning results is not yet sufficient to
confirm the superior performance of flipped learning over traditional learning, a number
of studies in this area have indicated that students report higher levels of satisfaction and
increased motivation and engagement in flipped learning environments (Chen et al.,
2.4.5 The flipped learning model in Australian universities

In their 2010 report, *Web-Based Lecture Technologies and Learning and Teaching: A Study of Change in Four Australian Universities*, Gosper et al. (2010) reported that in Australia “the uptake of web-based lecture technologies and delivering live lectures has increased markedly in recent years” (p. 84). These developments were reported to have transformed the learning of many students by freeing their study time and space and expanding their ability to acquire more knowledge. However, the authors flagged the concern that teaching methods had only been transformed to a small extent, despite the changes in students’ attendance patterns and reported concerns about their quality of learning. These authors remarked that “the technologies have been added on, rather than integrated into the curriculum” (Gosper et al., 2010, p. 84).

Some progress has been made, however, in the last few years. As the review of O'Flaherty and Phillips (2015) found, Australia seems to be among the small group of countries that is now implementing and publishing research on flipping academic courses, even though only two out of 28 articles selected by the authors were identified as being from Australia.

Similarly, a filtered search of scientific educational databases by the author of the current study conducted in October 2016 revealed only 13 relevant Australian studies, although more were found when searching using similar or related terms, such as “blended learning”. The following seven examples are helpful in providing an overview of some of the initiatives discussed by Australian researchers when examining the implementation of the flipped learning approach in local higher education institutions.

In his study, “Student Views on the Use of a Flipped Classroom Approach: Evidence from Australia” (2014), Butt reported on a flipped final-year actuarial course experience at the Australian National University. Surveying students at the start and end of the
semester to obtain their views on the learning experience (an experimental group with a flipped classroom experience and a control group with a traditional course experience), the researcher found that, “after experiencing the entire course with this teaching style, student views became, on average, far more positive towards the flipped classroom approach” (Butt, 2014, p. 33). The students mostly appreciated the combination of activity and demonstration. Their main concerns related to class size, and speed and engagement in both pre-class and in-class activities (Butt, 2014).

De George-Walker and Keefe (2010), distinguishing between teacher-centric and learner-centric constructions of a blended learning program, presented an evaluation of a learner-centric design for a core unit in a first-year higher education course at a regional Australian university (unnamed), which focused on students’ engagement, learning, and self-determination. Their finding suggested that “successful learners are aware of their learning and situational needs and preferences and are able to select learning formats to fit their changing needs” (p. 12). Furthermore, the authors recommended that the role of the teacher should be that of developing “multiple means of representation, expression and engagement and to scaffold and support students in the creation of their own individualised blend” (p. 12).

A more recent study conducted by Wanner and Palmer (2015), which noted that “Flexible teaching and learning and the ‘flipped classroom’ are current buzzwords in higher education in Australia and elsewhere in the world” (p. 354), discussed this progressive change towards more student-centred and learning-centred pedagogies and practices. Such pedagogies and practices are enabled, the authors argued, by new technologies that provide scope for greater personalisation and flexibility in higher education. Their study of a flipped learning model for an advanced undergraduate course on governance and sustainable development, at the University of Adelaide, found that
students enjoy and are more engaged in a flipped classroom; that they prefer a blended learning to a fully online learning approach; that they require clear structure and guidelines; and that they strongly value flexible assessment through more choices and control (Wanner & Palmer, 2015).

Four other studies were identified that also investigated the use of the flipped learning model in Australian universities, each discussing a very different program but reporting similar or complementary results. First, McCarthy (2016) examined flipped learning in a first-year three-dimensional (3D) animation course at the University of South Australia. The results of this study indicated that the majority of students preferred to have a combination of the traditional and flipped tutorial formats in future courses, rather than just flipped classroom sessions; they appreciated the allowance of study time and group discussions during the tutorial session; and the ability to work at their own pace. Moreover, it was found that the course tutors preferred the flipped learning model, despite an increase in workload, because they reported that it provided students with greater insights into the learning experience, increased engagement, and resulted higher levels of student-to-student and staff-to-student interaction.

Research based on a master’s program in library and information science at the Queensland University of Technology (Waha & Davis, 2014) generated similar results. This study reported that students like the flexibility and the convenience of online learning, but also the possibilities that derive from face-to-face interaction with teachers and peers for building personal learning networks. The authors highlighted the potential benefits of a blended learning approach in supporting a range of learning styles and lifestyles.

The remaining two studies focused respectively on the use of flipped learning in a marketing fundamentals undergraduate course at an (unnamed) Australian university.
Flipped Learning and Self-Regulated Learning Experiences in Higher Education: A Qualitative Case Study

(Jarvis, Halvorson, Sadeque, & Johnston, 2014) and a tertiary music course (C. Grant, 2013). The first study found that “greater student participation in workshop mode can lead to higher exam averages, even on complex problems or activities” (Jarvis et al., 2014), and argued that flipped learning should be introduced in first year, despite the fact that students often expected a more traditional approach to teaching, because such a new approach created “role clarity” early in the student experience. The second study, by C. Grant (2013), was a “hypothetical” (rather than an actual empirical) contrast between a traditional and a flipped learning approach. Despite have no direct empirical evidence, the author argued that the flipped learning approach a priori suggested new and innovative ways of engaging with students not available via the traditional approach.

2.4.6 The pre-service teachers’ perspectives on the flipped learning model

In their 2016 study exploring the pre-service teachers’ concerns about teaching in flipped classrooms, Hao and Lee stated that “to effectively promote the student-centred movement, it is important to understand pre-service teacher concerns about teaching in technology-integrated flipped classrooms” (p. 250). This study investigated the concerns of more than 470 pre-service teachers regarding flipped learning instruction at a university in Taiwan (unnamed), taking into account factors such as their levels of self-efficacy as teachers, teacher knowledge, and relevant demographics. The results indicated that the pre-service teachers mostly had concerns about themselves, relating to, for example, levels of self-efficacy and non-technological teacher knowledge. They also revealed that the female students had more awareness and management concerns than the male population, while the non-science pre-service teachers had more information, personal, and collaboration concerns; also, the more senior teachers had the highest levels of awareness of flipped classrooms (Hao & Lee, 2016). The authors concluded by emphasising the importance of immersing pre-service teachers in a student-centred and
technology-enhanced learning environment from the early stages of their career development, in order to prepare them to teach effectively in the classrooms of the future (Hao & Lee, 2016).

Another recent study, conducted by Fraga and Harmon (2015), investigated pre-service teachers’ perspectives of the flipped learning model of instruction and the impact of this model on their actual achievement during training at the University of Texas at San Antonio. Although this study of 51 undergraduate students found no significant differences between the flipped and the traditional models in terms of academic achievement, some insights into different factors that may influence the effectiveness of each model were revealed. These included, for example, topic considerations (it is difficult to facilitate “word study” in a flipped classroom), learners’ preferences (the flipped learning approach is more suitable for students who like time flexibility and freedom to work independently), and participant learning styles (a flipped approach requires a certain degree of self-directedness in learning). A positive finding of this study was that flipped learning instruction can create incentives for learning for all students (Fraga & Harmon, 2015).

Vaughan (2014) conducted a similar study to explore the use of the flipped classroom model in engaging pre-service teachers in the Introduction to the Teaching Profession unit at Florida Atlantic University. The author considered that learning to use such an approach is essential for millennial learners and teachers. The results of the study indicated that students displayed a higher level of reflection and inquiry in their coursework and used a greater number of instructional strategies as an effect of the course design. Therefore, this course approach had outcomes with twofold implications: it facilitated course learning, and was an inspiration for future professional development of the pre-service teachers (Vaughan, 2014).
A further three studies investigating the use of flipped classroom instruction in the context of pre-service teachers’ education were identified, which reached the following positive conclusions.

Flores (2016) found that, after being involved in a flipped learning unit on psychopedagogy, a group of teacher-educators and pre-service teacher-students from a Spanish university reported enriched teaching and learning processes, better integration of concepts, changes in the roles of professors and students, improvement in the processes of participation and communication, better integration of ICT, improvement in academic results, and higher levels of student interest in the course.

Marks (2015) examined how some particular key strategies from the flipped learning model can be adapted to an instructional methods course for pre-service teacher-students at a small public university in North Carolina, and found that with careful curriculum design, both content and methods learning objectives could be taught and mastered with this instructional approach.

Kong and Song (2015) implemented a “personalised learning hub” initiative, which embedded a technique they referred to as “Bring Your Own Device” (BYOD). The initiative was intended to stimulate learners’ reflective engagement in the flipped classrooms at a higher education institute in Hong Kong. The initiative enabled learners to achieve significant knowledge gains and enhance their understanding of e-learning through group interaction and experience sharing with peers, teachers, and experts. This approach also helped the students to engage in reflective inquiry, and the authors concluded that the approach could potentially further help them to deepen their learning and personal growth (Kong & Song, 2015).

In conclusion, and taking into account Lai’s (2015) comment that “teachers are important social agents who shape the quantity and quality of students’ self-directed use
of technology for learning outside the classroom” (p. 74), it is recommended that more research and innovative practice should be conducted in this area. This needs to address in particular the nature of student-teachers’ regulation of learning in teacher education (Endedijk et al., 2012) as well as the support of teacher-educators, including motivational support, capacity support, and behavioural support.

2.5 Impact of the Flipped Learning Environment on Students’ Self-Regulation in Learning: A Systematic Review

2.5.1 Introduction

The aim of the systematic review is to scope the literature for the most relevant studies generating evidence of the role of flipped learning on higher education students’ self-regulated learning strategies. This will be achieved by evaluating empirical studies from the last 10 years that have examined university students’ self-regulated learning processes in a flipped learning setting, and the scaffolding elements and other factors that influence these processes.

The review design was informed by the guidelines provided by Cronin et al. (2008) and Moher et al. (2010), as well as the approaches used in other systematic reviews in the area of self-regulated learning or flipped learning (Bethavas et al., 2016; Broadbent & Poon, 2015; Devolder, van Braak, & Tondeur, 2012). Based on the recommendations and good practices identified in the sources mentioned above, the systematic review design contains the following elements: (a) systematic review questions; (b) search, selection, and filtering strategy; (c) search outcomes; (d) data extraction; (e) findings; and (f) discussion.
2.5.2 Systematic review questions

The following main questions were used to guide the searches for this systematic review:

1. What is known about the impact of the flipped learning approach on higher education students’ experiences of self-regulated learning?

2. What is known about factors that influence students’ experiences of self-regulated learning in the flipped learning environment?

3. What methodological approaches have been used to study the effectiveness of the flipped learning environment in higher education?

2.5.3 Search, selection, and filtering strategy

Searches were conducted for relevant peer reviewed published papers using the following databases: PsycINFO, ProQuest (Central; and Education Journals), ERIC, Elsevier, Taylor & Francis Online, A+ Education, SAGE Journals, EBSCOhost (Education Research Complete), OneFile, Springer, MEDLINE/PubMed, JSTOR, Wiley, and Directory of Open Access Journals (DOAJ).

Boolean operators—AND, OR and NOT— were used to combine the following search terms in various ways: flipped classroom, flipped learning, flipped instruction, flipped-class, inverted classroom, blended learning, blended instruction, online learning, technology-enhanced learning, self-regulated learning, self-directed learning, self-determined learning, independent learning, active learning, student-centred learning, problem-based learning, metacognition, self-control, self-efficacy, motivation, learning, help seeking, task value, learning strategies, teaching strategies, critical thinking, peer learning, cognitive, metacognitive, learning environment, higher education, flexible education.
Included papers were restricted to peer reviewed journal articles published in English language journals between 2006 and 2016. More than 200 article abstracts that met the search criteria were initially downloaded into the Mendeley desktop application for further review, and duplicates were removed.

References to potentially relevant papers were also examined to identify additional articles meeting the inclusion criteria that may have been missed by the initial searches. More specific inclusion and exclusion criteria, as shown in Table 2-4, were used to identify the most suitable studies for final review. Full texts of all potentially useful papers were eventually downloaded for further review.

Table 2:4 Articles inclusion criteria

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<tr>
<th>Criterion</th>
<th>Description</th>
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<td>Types of studies / research objectives</td>
<td>All studies that examine the application of self-regulated learning strategies by students in a flipped learning class/environment were included. Studies focusing on traditional classroom learning, distance/online-only learning environments, or other learning strategies were excluded.</td>
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<td>Types of studies / research methodology</td>
<td>Studies that presented a clear research methodology, with clearly defined research objectives, design, and results, were selected. Studies using a triangulation of methods were preferred. Papers reporting studies with unclear research methodologies were excluded.</td>
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<td>Types of participants</td>
<td>The review only included studies with university, college, or equivalent students as participants. Studies that were based on research with other types of participant were excluded, with the exception of a single study that was considered to meet a high standard of research methodology and to use a sound theoretical framework. Other variables such as gender, race, age, and disciplinary profile of the students were not considered in the selection.</td>
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<tr>
<td>Types of outcomes measured</td>
<td>Studies that assessed the manifestation of students’ self-regulated learning processes in a flipped learning environment were incorporated. Studies were also included if they investigated specific aspects of these processes, such as the use of self-regulated learning strategies, self-regulated learning readiness, or the correlation of self-regulated learning with other variables such as students’ engagement, motivation, or achievement. Studies not measuring any aspect of self-regulated learning were excluded from the selection.</td>
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2.6 Systematic Review Findings

2.6.1 Overview of results

Fourteen evidence-based studies were found to meet the selection and filtering criteria, with all of these examining the application of self-regulated learning strategies by students in a flipped learning environment. One of the studies was based on research with students in a flipped elementary classroom, while the remainder were focused on the experiences of undergraduate university students. The selected articles covered research published between 2014 and 2016. Nine of the 14 studies were conducted in North America, four in Asia, and only one in Europe. No studies conducted in Australia met the inclusion criteria. Thus, in the Australian context, it can be concluded that there is a lacuna in the research on the impact of flipped learning on self-regulatory learning.

Two of the studies used qualitative research methods, two used quantitative methods, and the remaining 10 used mixed-methods methodologies mostly based on a quasi-experimental design. The aims and objectives of these studies included testing the impact of the self-regulated flipped classroom on students’ achievements (Butzler, 2016; Koo et al., 2016; C. Lai & Hwang, 2016; Moos & Bonde, 2016; Sletten, 2015; Yong, Levy, & Lape, 2015); exploring the dynamics of specific self-regulated learning processes or strategies (Kopcha et al., 2015; C. Lai, 2015; Sun, Wu, & Lee, 2017; Tawfik & Lilly, 2015; Van Vliet, Winnips, & Brouwer, 2015); and developing principles to support those processes or strategies (Hao, 2016; M. Kim et al., 2014; Talbert, 2015).

The studies covered a diverse range of subjects, though the majority drew these from technical or scientific disciplines. Six flipped classrooms in the social sciences and humanities areas were examined, including three in education studies. Sample sizes varied widely from 254 to 743. The most relevant data were extracted from these articles.
and are presented in Table 2-5, with the findings synthesised and summarised by key themes in the following subsections.
Table 2: Evidence-based studies investigating the impact of the flipped learning approach on students’ self-regulating learning strategies

<table>
<thead>
<tr>
<th>Author/s, year, country</th>
<th>Research objective</th>
<th>Research design</th>
<th>Sample and study population</th>
<th>Reported outcomes</th>
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<td>Bätzler (2016), USA</td>
<td>To test whether a flipped learning environment would influence the grades of academically at-risk students when using self-regulated learning tools</td>
<td>Mixed-methods (quasi-experimental, using students’ demographic data, pre-/post-test, and post-course qualitative questionnaire)</td>
<td>Undergraduate chemistry students at an open-enrolment college; Lecture class (N=45); Flipped class (N=45)</td>
<td>Academic scores and class rank significantly predicted overall course grade regardless of the learning environment. Top, middle, and bottom-third graduates increased their overall course grades in the flipped classroom using self-regulated tools by 7%, 3%, and 6%, respectively. Students found self-regulated learning scaffolding techniques helpful in their learning process.</td>
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<td>Erkan et al. (2015), USA</td>
<td>To explore online help-seeking behaviour in a large-enrolment flipped science classroom</td>
<td>Qualitative (using the Educational Design Research framework, with two study cases)</td>
<td>Undergraduate microbiology students; Study 1 - Fall 2013 (N=387); Study 2 - Spring 2014 (N=356)</td>
<td>Students found use of a web-based help-seeking tool beneficial for their learning. This was mainly due to their ability to observe and examine the questions posted by peers, and to learn anytime and anywhere using the whole class as a learning source.</td>
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<td>Hao (2016), Taiwan</td>
<td>To test undergraduate students’ preferences and readiness regarding flipped learning</td>
<td>Mixed-methods (survey and open-ended questions, classroom observation)</td>
<td>Undergraduate IT and education students (N=84)</td>
<td>Highest level of readiness was in technology self-efficacy (M=3.79, SD=0.64). Second highest readiness level was in self-directed learning (M=3.44, SD=0.58). Lowest readiness levels were in communication self-efficacy (M=3.27, SD=0.70) and motivation for learning (M=3.28, SD=0.68). Self-management predicted the readiness dimension of self-directed learning (p &lt; .01).</td>
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<td>M. Kim et al. (2014), USA</td>
<td>To identify good practice design principles for flipped classroom courses</td>
<td>Mixed-methods (surveys, interviews, instructor's reflections, and document analysis)</td>
<td>Undergraduate engineering, social studies and humanities students (N=41)</td>
<td>Desire for learning predicted the overall readiness (p &lt; .05) and the individual readiness dimensions of technology self-efficacy (p &lt; .05) and motivation (p &lt; .05). Self-control did not predict any readiness dimension. More than half (59.5%) of the respondents agreed or strongly agreed with the idea of flipped classrooms. Students showed the highest preference levels for Bring your own Device (BYOD) and the Instant Response System (IRS) compared with other self-regulated learning tools.</td>
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<td>Koo et al. (2016), USA</td>
<td>To test the impact of the flipped classroom design on student performance and perceptions of the learning experience compared to that of the traditional lecture course design</td>
<td>Mixed-methods (quasi-experimental with pre-/post-test and pre-/post-course surveys)</td>
<td>Undergraduate pharmacotherapy students (N=89)</td>
<td>Overall class performance improved after the course redesign. The mean examination score increased from 83.4% to 88.2%. Students reported positive attitudes toward the flipped classroom design, including the greater flexibility and convenience of viewing recordings, the increased class time spent on applying content, effective content organisation. Negative points referred mainly to the large amount of time spent on viewing recordings due to the need to pause for taking notes.</td>
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<td>Lai (2015), Hong Kong</td>
<td>To model the influence of teacher behaviours on learners' self-directed technology use</td>
<td>Quantitative (survey)</td>
<td>Undergraduate students in second language courses; Interviewed (N=15); Surveyed (N=160)</td>
<td>Teacher's recommendation was the form of behaviour most highly valued by students for influencing their capacity to use technology for learning outside the classroom.</td>
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<td>Lai &amp; Hwang (2016), Taiwan</td>
<td>To test an experimental design intended to help students schedule their independent study time to effectively read and comprehend the learning content before class</td>
<td>Mixed-methods (quasi-experimental with pre-/post-test surveys and pre-/post-course self-efficacy and self-regulation questionnaires)</td>
<td>Fourth-grade elementary students taking a mathematics course; Experimental group (N=20); Control group (N=24)</td>
<td>Students held positive perceptions of the usefulness of technological resources for language learning and were confident about their abilities to use technology. Affective support influenced self-directed use through perceived usefulness. Capacity support and behaviour support influenced self-directed use through facilitating conditions and computer self-efficacy. Students in the experimental group performed significantly better than those who learned with the conventional flipped classroom approach. Students who engaged in higher self-regulation showed significantly higher achievement than those with lower self-regulation while learning with the self-regulated flipped classroom approach. Regardless of whether students engage in higher or lower self-regulation, they can improve their awareness of self-regulation when learning with the self-regulated flipped classroom approach. Allowing the students to experience active learning, and receiving personalised feedback based on their learning status, improved their self-efficacy. Students who learned with the self-regulated flipped classroom approach showed higher performance in goal setting, task strategies, time management, help seeking, and self-regulation.</td>
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<td>Moos &amp; Bonde (2016), USA</td>
<td>To examine the effectiveness of embedding self-regulated learning prompts in a video designed for the flipped class model</td>
<td>Mixed-methods (quasi-experimental with pre-/post-test essays, a think-aloud protocol, and a mental effort survey)</td>
<td>Undergraduate students (educational psychology course for pre-service teachers) (N= 32)</td>
<td>Embedded self-regulated learning prompts positively affected both learning processes and outcomes, and did not have a negative impact on perceived mental effort. There was a significant difference in instructional efficiency, with higher results for the experimental group. Participants’ monitoring of their understanding was significantly and positively related to pausing and replaying the video.</td>
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<td>Sletten (2015), USA</td>
<td>To determine if the use of self-regulated learning strategies contribute to student success in a flipped course</td>
<td>Quantitative (MSLQ and perception surveys)</td>
<td>Undergraduate students in flipped courses on statistics, physics, biology, history, and assessment in two universities (N=151)</td>
<td>On average, participants in the control group rarely monitored their learning, paused and replayed the video less frequently, and performed worse on the post-test than those in the experimental group. Students who perceive benefits from the flipped model tend to use self-regulated learning strategies more. The five self-regulated learning strategies and two flipped benefit scales significantly predicted course grade. However, grade was only weakly correlated with elaboration or metacognitive and effort regulative strategies.</td>
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<td>Sun, Wu, &amp; Lee (2016), Taiwan</td>
<td>To investigate the effect of the flipped classroom approach to OpenCourseWare instruction on students' self-regulation</td>
<td>Mixed-methods (quasi-experimental with pre-/post-test surveys, pre-/post-course questionnaires, and a semi-structured interview)</td>
<td>Undergraduate physics students; Experimental group (N=91); Control group (N=90)</td>
<td>Among the self-regulation factors—goal setting, choice of learning environment, learning strategy, time management, help seeking, and self-evaluation—only help seeking showed a significant difference as being a self-regulated strategy facilitated by this type of learning environment.</td>
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<td>Talbert (2015), USA</td>
<td>To examine the benefits of employing an inverted or flipped class design including social norms and self-regulated learning acquisition and ways to address those</td>
<td>Mixed-methods (quasi-experimental with pre-/post-test MSLQ surveys and four open-ended questions)</td>
<td>Undergraduate students in a “transition-to-pProof/Mathematics course” (MSLQ surveyed, N = 32; open questions surveyed, N = 16)</td>
<td>Overall, participants scored less than 5 out of 7 on just two MSLQ scale items (note-taking and self-questioning). There was a marginal decrease in non-passing grades and a marginal increase in top grades between the pre- and post-test results. Only two participants were explicitly negative regarding their experience with the inverted classroom.</td>
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<tr>
<td>Tawfik &amp; Lilly (2015), USA</td>
<td>To investigate the implementation of a flipped classroom using themes related to relevance, reciprocal learning,</td>
<td>Qualitative (a &quot;work-in-progress&quot; case study, presenting interview results)</td>
<td>Undergraduate Psychological statistics students (N=24)</td>
<td>Four themes emerged through analysis of participant language about flipped learning in a problem based learning (PBL) classroom: relevance, reciprocal learning, teacher as facilitator, and self-efficacy. Perceived relevance of problems generated interest in subject matter.</td>
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<td>van Vliet, Winnips, and Brouwer (2015), The Netherlands</td>
<td>To investigate the effects of flipped classes on motivation and learning strategies in higher education</td>
<td>Mixed-methods (quasi-experimental with pre-/post- and impact test MSLQ surveys, and post-course evaluation questionnaires)</td>
<td>Undergraduate psychobiology students (N=170)</td>
<td>Learners valued being able to revisit the videos as they progressed in their problem-solving processes. The instructor's role shifted more towards that of a learning facilitator. Students’ initial trepidation over the subject matter decreased as their self-efficacy improved throughout the semester. The videos supported student self-efficacy by providing reinforcement of their self-directed learning path. Exam grades of students in the experimental group were higher than the grades of those in the control group. Exam questions requiring a high cognitive input were answered correctly by 41% of the students in the experimental group but only by 23% of the control group. Self-regulation scores increased for the experimental group compared with the control group, but long-lasting effects of the flipped class were not evident five months later. The most significant differences were in critical thinking, task value, and peer learning. Some students found watching the videos in the flipped-class approach burdensome in terms of time.</td>
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<td>Yong, Levy, &amp; Lape (2015), USA</td>
<td>To examine the impact of a flipped learning course and compare experiences of an interactive lecture incorporating elements of active learning with experiences of a traditional lecture</td>
<td>Mixed-methods (intermediary report on a four-year longitudinal study, based on pre-/post-test and also homework scores and quiz scores, pre-/post-surveys)</td>
<td>Undergraduate students in an Introductory Differential Equations course (Experimental group, N=86; control group, N=90)</td>
<td>Student achievement was nearly indistinguishable between the control and treatment groups. There was a mix of opinions regarding the flipped classroom experience; positive and negative feedback seemed balanced. Almost all students valued the ability to pause, rewind, and fast-forward through the video lectures. Many students in the flipped learning group reported difficulties in relation to asking real-time questions during lectures and following up adequately during class time.</td>
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<td>Half of the control group mentioned struggles with procrastination, motivation, and time management, but also reported working more collaboratively on the homework in class.</td>
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2.6.2 Use of tools and strategies to support self-regulation in flipped learning classrooms

The majority of the flipped learning interventions used the “classical” format: students watched pre-recorded videos, listened to podcasts (Kopcha et al., 2015), or read e-books prior to attending class to work collaboratively on problems, case studies, and other activities (C. Lai & Hwang, 2016). Many other preparatory pre-class and in-class activities and learning resources were also used to support students’ self-regulated learning strategies. For example, one of the most common approaches documented in these studies was the use of guided self-reflection and self-assessment using tools and techniques such as exam wrappers (Butzler, 2016), learning journals (Hao, 2016), short quizzes with immediate feedback (Hao, 2016; M. Kim et al., 2014; Koo et al., 2016; Van Vliet et al., 2015; Yong et al., 2015); a think-aloud protocol (Moos & Bonde, 2016), a brief quiz upon arrival to class (Talbert, 2015), and online or offline question-and-answer sessions either in-class (six studies) or off-class (eight studies). Another common strategy was the use of collaborative problem-solving activities, reported in 11 of the 14 studies.

Other types of tools and activities reported in a small number of studies included the use of guided note-taking (Butzler, 2016), online learning management systems’ online tools (Kopcha et al., 2015; C. Lai & Hwang, 2016), guided practice for individual or group work (Hao, 2016; Talbert, 2015), development of course portfolios (Hao, 2016; Talbert, 2015), and online forums for the use of peer discussion (Van Vliet et al., 2015) or peer assessment (Hao, 2016; M. Kim et al., 2014). Other studies reported the use of learning incentives (M. Kim et al., 2014), student-led in-class activities (M. Kim et al., 2014), and the use of students’ progress-tracking tools to identify difficulties and provide feedback (Koo et al., 2016).
2.6.3 Impact of the flipped learning environment on students’ self-regulated learning

Ten of the 14 studies reviewed explicitly assessed specific self-regulated learning processes or strategies. Most of these studies evaluated students’ overall satisfaction with their learning experience (nine studies), or the overall self-regulated learning scores on scales such as the MSLQ (eight studies). Overall, most of the students participating in these studies reported high levels of satisfaction with their experiences of the flipped learning interventions that were designed to facilitate self-regulated learning. The perceived benefits of this approach included, for example, expanding learning through the use of help seeking (Kopcha et al., 2015), note-taking and exam wrappers (Butzler, 2016); receiving instant feedback on their performance (Hao, 2016); the enhanced teaching presence and support (Koo et al., 2016; C. Lai, 2015; Talbert, 2015); greater flexibility enjoyed by the students (Koo et al., 2016); and the use of reciprocal or peer learning (Tawfik & Lilly, 2015; Van Vliet et al., 2015).

However, the overall impact of scaffolding tools for self-regulated learning was not found to be statistically significant in some of the studies (Butzler, 2016; Yong et al., 2015), while in others the impact was only significant in the case of specific aspects of self-regulated learning which were not consistent across the studies. For example, Van Vliet et al. (2015) reported evidence of significant differences only in the areas of critical thinking, task value, and peer learning, while Lai & Hwang (2016) found a statistically significant impact of the self-regulated learning tools on goal setting, task strategies, time management, help seeking, and self-regulation. Other studies reported a significant impact of the evaluated self-regulated learning tools and strategies only in relation to help seeking (Sun et al., 2017) and self-reflection (Moos & Bonde, 2016). The study by Sletten (2015) revealed the important finding that those participants “who perceive benefits from the flipped model tend to utilize self-regulated learning strategies more” (p. 499).
Overall, grade correlations with the self-regulated flipped learning classrooms were either weak or not reported in the 14 studies analysed. The findings of Butzler (2016), who reported that the “students graduating high school in the top third, middle third, and bottom third of their graduating class increased their overall course grades in a flipped learning model using self-regulated tools by 7%, 3%, and 6%, respectively” (p. 11) is typical of the modest gains in grades reported as a result of the interventions that were evaluated.

However, many of the studies did explicitly report positive impacts of the flipped learning experience on aspects of self-regulated learning among their student participants. Specifically, a positive influence was documented on help-seeking strategies (Kopcha et al., 2015; C.-L. Lai & Hwang, 2016; Sun et al., 2017); self-efficacy (Hao, 2016; C. Lai & Hwang, 2016; C. Lai, 2015; Tawfik & Lilly, 2015); the use of metacognitive strategies, critical thinking, or self-reflection (Butzler, 2016; Hao, 2016; Sletten, 2015; Van Vliet et al., 2015; Yong et al., 2015); perceived task value; and the use of peer learning strategies (Van Vliet et al., 2015).

Various challenges relating to the use of self-regulated learning in flipped learning environments were also reported, from both students and teachers. The types of challenges reported by students related to the use of overly intrusive, technically complicated, or difficult tasks (Hao, 2016; M. Kim et al., 2014); excessive amounts of time spent on activities outside class (Koo et al., 2016); missing the opportunity to ask real-time questions during lectures and to follow-up adequately during class time (Yong et al., 2015); the quality of online group discussions (Hao, 2016); and struggles with procrastination, motivation, and time management or taking responsibility for one’s own learning (Hao, 2016; Yong et al., 2015).
Teachers and instructors, on the other hand, mainly reported a number of difficulties. These included facilitating group work and student collaboration (M. Kim et al., 2014); the significant up-front investment of time needed for preparing or creating course materials such as videos, tutorials, or self-assessment tests (Talbert, 2015); facing students’ reluctance in self-regulating their own learning processes (Talbert, 2015); and adapting to the vast diversity of student learning styles (Talbert, 2015).

2.7 Discussion of the Extant Literature

2.7.1 Implications for the current study

The findings of the systematic review highlight ways in which the current study can contribute to an improved understanding of how the flipped learning model can help facilitate the use of self-regulated learning. These contributions are presented below, categorised according to the main elements of Pintrich’s (1991, 2004) self-regulated learning model areas. It should be borne in mind that, although the extant literature is useful for thinking about what kinds of factors are likely to be important in affecting self-regulated learning in a flipped learning environment, they do not address the particularities of concrete Australian applications. As noted above, when it comes to the Australian context, there is a lacuna in the research on the impact of flipped learning on self-regulatory learning. The extant literature can provide theoretical and empirical resources to direct the current study, but are not substitutes for it.

2.7.1.1 Motivational strategies

The earlier systematic review by Devolder et al. (2012), which investigated the literature on scaffolding measures to support self-regulated learning in computer-based learning environments for science education, revealed that most studies in this area focus
on cognition and relatively few focus on the non-cognitive areas of self-regulated learning.

The systematic review conducted for the current study also found little evidence of research into the motivational or affective factors influencing students’ self-regulated learning in flipped learning environments. In the main, the studies reviewed had a focus on setting and monitoring learning goals (C. Lai & Hwang, 2016; C. Lai, 2015; Van Vliet et al., 2015). However, the review did reveal the use of motivational initiatives intended to create incentives for learning. These included, for example, the use of a points system integrated in the learning management system (C. Lai & Hwang, 2016); peer assessment (Hao, 2016); and developing an interactive and stimulating environment through instant feedback or by allowing students to use their own devices during in-class activities (Hao, 2016).

The concept of self-efficacy was the motivational element of self-regulated learning given the most attention in the research, with most of the studies having a focus on ways of developing self-efficacy in students (Hao, 2016; C. Lai & Hwang, 2016; C. Lai, 2015; Tawfik & Lilly, 2015). Satisfaction was another of the motivation-related variables most commonly evaluated in relation to the students’ overall experience of flipped learning classrooms.

The variable task value was measured in Van Vliet et al.’s (2015) study only. The variables, control of learning beliefs and task anxiety, were both addressed by just two studies: those of Lai & Hwang (2016) and Van Vliet et al. (2015).

2.7.1.2 Learning strategies

Critical thinking and metacognitive self-regulation were the learning strategies most commonly examined in the reviewed studies (Butzler, 2016; Hao, 2016; Sletten, 2015; Van Vliet et al., 2015; Yong et al., 2015). The studies revealed a range of scaffolding
measures being used to support these, such as guided note-taking, guided self-reflection, and self-assessment, the use of online learning management systems, course portfolio development, progress-tracking, and constant feedback.

Only studies using MSLQ surveys explicitly investigated the rehearsal, elaboration, and organisation elements of self-regulated learning (Sletten, 2015; Talbert, 2015; Van Vliet et al., 2015; Yong et al., 2015).

2.7.1.3 Resource management strategies

Besides the studies that applied MSLQ survey pre- and post-intervention (Sletten, 2015; Talbert, 2015; Van Vliet et al., 2015; Yong et al., 2015) and therefore measured the students’ resource management strategies, some studies specifically investigated resource management strategies using experimental or qualitative methods. These mainly focused on the self-regulated learning strategies of help seeking (Kopcha et al., 2015; C. Lai & Hwang, 2016; Sun et al., 2017) and peer learning (Van Vliet et al., 2015), but effort regulation (Kopcha et al., 2015) and time and study environment management (C. Lai & Hwang, 2016) were addressed in individual studies.

For example, based on their study of college students’ online help-seeking behaviour in a flipped learning model, Erkan et al. (2015) concluded that supporting students’ information-seeking performances leads to better effort regulation capacities. The learning management system developed by Lai C. & Hwang (2016) to help students from an early age to manage their learning time and resources in a self-regulated approach, represents an exemplary case for helping students to develop resource management strategies.

Besides these insightful evaluations and experimental initiatives, the 14 research designs inspired the methodology of the current research. The review revealed some impressive qualitative research initiatives in this area. These include, for example, Erkan
et al.'s (2015) study involving 743 students, which explored online help-seeking behaviour in a large-enrolment unit that applied a flipped learning model. Another good practice example is Tawfik & Lilly's (2015) work-in-progress, a four-year longitudinal qualitative study which aims to investigate the implementation of the flipped learning model in relation to relevance, reciprocal learning, teacher as facilitator, and self-efficacy. Finally, the mixed-methods studies identified used some interesting research techniques such as the think-aloud learning strategy experimental protocol and the mental effort survey (Moos & Bonde, 2016).

2.7.2 Limitations of systematic literature review

Notwithstanding the extensive and inclusive search, some relevant studies may yet have been missed, especially those articles not published in the English language.

Another limitation of the review is the small number of studies that met the inclusion and quality criteria. The relatively recent appearance of this topic in the literature and its lack of methodological and theoretical maturity could explain this.

The review revealed a diversity of methodological approaches. Although this provides an opportunity to examine flipped learning from many different perspectives, it also means that it is difficult to draw any firm conclusions regarding methodological trends in this area of the research literature. Broadbent and Poon (2015) noted that measures such as the MSLQ should be used with caution when investigating online (or mixed) learning environments, because the initial survey was built for use in the traditional face-to-face classroom. Four of the 14 studies included in this review used this or similar instruments, and their findings should therefore be interpreted with this in mind.

A final limitation concerns the lack of a common, standardised language pertaining to self-regulated learning and the flipped learning model in these studies. Even in the case of flipped learning alone, multiple terms have been used, such as inverted classroom,
flipped-class, flipped-classroom, and flipped-learning instruction. Again, this is likely to reflect the short history of this theoretical construct.

2.8 Chapter Summary

This chapter has reported on the findings of a literature review intended to provide a theoretical as well as an empirical foundation for the current study. Self-regulated learning has a long history and there is now a substantial body of literature expounding it theoretically and testing its efficacy empirically. Theoretically, its modern form relies on Bandura’s (1991) social cognitive theory. This has given rise to a number of different process-focused and hierarchy-focused models of self-regulated learning. Pintrich’s (1991, 2004) general framework of self-regulated learning was determined to be the most appropriate theoretical framework for the present study. This model is the most comprehensive one available, is based on well-established concepts and indicators that have been validated in many previous studies, and is grounded in the well-developed and empirically supported social cognitive theory (Bandura, 1991). However, the review also provides the current study with a broader foundation which draws on a range of other self-regulated learning models and concepts.

With respect to empirical studies, an important overall finding of the review is that self-regulation of learning in the tertiary education sector has proved to be very important to academic success. Strategies and skills for self-regulation of learning need to be further developed in students because, according to numerous studies, many students arrive at universities without the capacities required to engage in self-regulated learning. This supports the need for additional research into flipped learning as one of the approaches or tools that might be used to help promote self-regulated learning in higher education.

In contrast to self-regulated learning, flipped learning is a relatively new concept and thus its efficacy as a mode of teaching has not yet been thoroughly investigated.
empirically. Indeed, there is not, as yet, an agreed upon specification of a flipped learning model. A number of approach have been identified; the present study will rely on Abeysekera and Dawson’s (2014) definition of the flipped learning model as it incorporates the key common features of these models. These authors argue that flipped learning aims to “remove [the] traditional transmissive lecture and replace it with active in-class tasks and pre-/post-class work” (Abeysekera & Dawson, 2014, p. 1). A number of studies—albeit relatively few compared to other, older areas of pedagogical inquiry—suggest that considerable educational benefits can be gained by using a flipped learning model.

With respect to the application of flipped learning to tertiary education, there is some empirical evidence of improved academic performance, higher levels of student satisfaction, and increased student motivation and engagement. However, this field of study is still underdeveloped and inconclusive. In the case of Australian universities in particular, there have only been 13 empirical studies conducted to date, and their verdicts on efficacy of the flipped learning model were mixed and inconclusive.

Although there are growing bodies of research on self-regulated learning and on the flipped learning model, the major lacuna in the literature is on the impact of a flipped learning model on the self-regulated learning of students. Here, very little work has been done: only 14 studies in total, none of which cover Australia. Of these studies, only two were qualitative studies that sought to examine the impact of a flipped learning model on the self-regulated learning of students from students’ own phenomenological perspectives. The review of literature therefore confirms that there is a significant gap in existing knowledge about the impact of flipped learning on the self-regulated learning of students in higher education, in general, and more specifically using qualitative methods to examine this from the students’ own perspectives.
As the review has shown, the current trends in the development of new educational environments to support students’ self-regulated learning are transforming education systems at a rapid pace. There is a pressing need for multiple stakeholders to adapt to this, starting with students and teachers, and continuing to institutional managers, educational services providers, and policymakers. The present study is designed to address the substantial information gap relating to the ways in which flipped learning in higher education facilitates or promotes self-regulated learning, and any barriers to this. By using qualitative methods to examine the relationship between a flipped learning model and self-regulated learning in the Australian university context, based on the personal experiences and reflections of students, the study is expected to make a significant contribution to the literature, and perhaps ultimately help to inform practice.
3  METHODOLOGY

3.1 Introduction

This qualitative instrumental case study was conducted to understand how the flipped learning model may promote self-regulated learning among undergraduate and graduate students enrolled in a pre-service teaching program at an Australian university. After piloting recruitment procedures and testing focus group interview questions, multiple data collection methods were used to generate the findings of the study. The data sources consisted of focus group interviews, semi-structured interviews, students’ reflective learning journals, and trace data.

The goal of this study was to provide “thick” description of the potential relationship between the flipped learning model and self-regulated learning, in order to improve understanding of how students take active control of their own learning in the higher education context. Determining the effectiveness of the flipped learning model as an environment with potential for self-regulated learning requires the collection of students’ opinions, and the assessment of students’ self-regulated efforts as well as their assessment of the learning environment. Therefore, a case study research approach is deemed appropriate for understanding how self-regulated learning “shapes and is shaped by
context” (D. Butler, 2011, p. 347)—the context in this case being the flipped learning model.

Employing Pintrich's (2004) theory of self-regulated learning as a theoretical framework, this study was conducted in order to understand the perceptions and behaviours of 20 female pre-service teachers enrolled in a flipped learning unit. The central question of this instrumental case study was:

**What is the role of the flipped learning model in self-regulated learning in the context of higher education?**

The following secondary questions emerged from the central question:

Sub-research question 1: **What forms of self-regulated learning are demonstrated by students in the flipped learning model?**

Sub-research question 2: **What are the possible factors that influence students’ self-regulated learning in the flipped learning model?**

Sub-research question 3: **How is students’ self-regulated learning being developed or shaped by the flipped learning model?**

This chapter serves as a map of the research journey in this study. First, an outline of the epistemological stance and theoretical underpinning of this research is provided. Then, the choice of the methodological approach employed in this study is explained. This explanation discusses the development of the research design, describes the study context, and addresses the participant recruitment methods, ethical considerations, data sources and collection procedures, and methods of analysing the data. Concerns about validity and limitations of the study are also addressed.

### 3.2 Research Principles and Framework

As Crotty (1998, p. 3) points out, there are four foundational elements of any research endeavour. These often-unstated elements are: epistemology, theoretical perspective,
methodology, and methods. Much like Russian nesting dolls (*Matryoshka*), each element, although apparently self-contained, is also hierarchically related to the others, with the narrower element inheriting features of its broader immediate family member. This metaphor, illustrated in Figure 3-1, neatly expresses the epistemology, theoretical perspective, methodology, and methods that were used in this study.

![Figure 3-1 Theoretical framework of the current study](Illustration by Marriam Alomari)

*Epistemology*, the largest doll, is the theory of knowledge underlying the entire research process and governing the theoretical perspective of choice (such as objectivism, subjectivism, or constructivism). *Theoretical perspective* refers to the theoretical principles that inform the methodology used (such as positivism or interpretivism).
Methodology is the research design that determines the particular methods used in the study (such as quantitative, qualitative, or mixed-methods design). Methods, the smallest doll, refers to the specific techniques or tools of data collection and data analysis used to directly answer an investigation’s research questions (such as interviews, observation, or trace data) (Creswell, 2013; Crotty, 1998; Denzin & Lincoln, 2011).

This study is founded on a constructionist epistemology, using an interpretivist (that is, symbolic interactionist) theoretical perspective, which in turn influences the qualitative methodological nature of this study. In the following sections, these elements are discussed in turn.

3.2.1 Epistemology: Constructionism

Epistemology is concerned with the philosophical theory of knowledge underpinning an investigation of some aspect of reality (Creswell, 2013; Yin, 2011). Crotty (1998) identifies an array of epistemologies, such as objectivism, subjectivism, and constructionism. Objectivism is based on the notion that meanings reflect the mind-independent essences of real entities. By contrast, subjectivism takes the stance that meaning is generated entirely by the subjective mind. Meanwhile, constructionism suggests that meaningful reality is constructed through our interactive engagement with our world (Crotty, 1998). People build their own meanings of the world from their experiences of the events that they face during their lives (Merriam, 1998; Seale, 1999). As such, constructivism incorporates aspects of both objectivism and subjectivism. A mind-independent reality is presumed to exist, but does not dictate meaning, and active meaning-making minds also exist, but do not produce meaning ex nihilo. Meaningful reality is constructed by the interaction of the objective and the subjective.

Following Crotty (1998, p. 217), the epistemological stance that a researcher takes has to “serve our purposes best, one that helps us more than any other to answer our research
question”. For the purposes of this study, constructionism is the best-suited epistemology for two main reasons. First, in this study an attempt is made to understand the possible association of the flipped learning model and self-regulated learning in higher education from the perspective of students’ own realities and experiences. The learning experiences of participants enrolled in a flipped learning model are constructed by their personal meaning-making of self-regulated learning within this learning environment. Because students “construct” their own realities of how they self-regulate their learning according to the way they interact with the flipped learning model, constructionism is most suitable for exploring this.

Second, as discussed in Chapter 2, the self-regulated learning framework is derived from Bandura’s social cognitive theory (Bandura, 1986), and constructionism is highly compatible with this theory. Social cognitive theory views an individual learning about the world through the reciprocal interplay of personal factors, patterns of behaviour, and environmental influences (Bandura, 1999). As an agent, a person exerts intentional influence over one’s functioning and over environmental events by one’s actions (Bandura, 2012). Viewing students as agents means assuming that through social influences (e.g., social practices, modelling, or explicit instruction) they can shape their learning environment based on their interpretation and construct their own realities (D. Butler, 2011, p. 355).

From this stance, reality is somewhat relative as it depends on the individual perspective (Baxter, Susan Jack, & Jack, 2008). The concept of constructionism “recognizes the importance of the subjective human creation of meaning but doesn’t reject outright some notion of objectivity. Pluralism, not relativism, is stressed, with focus on the circular dynamic tension of subject and object” (Crabtree & Miller, 1999, p. 10). This epistemological standpoint celebrates the democratisation of meaning-making
between the researcher and the participant. It embraces the openness and reflexivity of the researcher to give the participants the space to tell their own stories, in order to establish thick volumes of realities (Baxter et al., 2008; Maxwell, 2009).

The selection of the constructionist epistemological position had important implications for the theoretical and methodological choices that were subsequently made for this study. In particular, the theoretical perspective of interpretivism naturally followed from a constructionist stance, as did the selection of the case study paradigm, as discussed below.

3.2.2 Theoretical perspective: Interpretivism

The theoretical perspective of interpretivism stands behind and provides a grounding for the methodological procedures and criteria used in this study (Crotty, 1998). The theoretical assumptions rely on the rich interpretation of the lived experiences of the participants within the flipped learning model and how this particular learning environment impacts on self-regulated learning. This places the researcher in the position of an “interpreter” who attempts to acquire an “internal” understanding of the participants involved in this study (Schwandt, 1994).

The concept of interpretivism is a rendition of the German notion, “Verstehen”, as associated with the work of the sociologist Max Weber. In broad terms, “Verstehen” refers to the understanding of meaningful human behaviour, as distinct from “Erklären”, which entails causal explanation of phenomena (and is usually associated with the physical sciences) (Crotty, 1998, p. 67). In the social sciences, we embrace the perspective of understanding what constitutes the worldview of individuals and the contexts constructed by social actors (Schwandt, 1994). Therefore, we attempt to interpret the thoughts and actions of those social actors who “in particular places, at particular times, fashion meaning out of events and phenomena through prolongs, complex
processes of social interaction involving history, language, and action” (Schwandt, 1994, p. 222).

Constructivism is often combined with interpretivism as a reaction against the positivist approach to the study of social actors (Mack, 2010). It is founded on the belief that social reality cannot be observed objectively and externally (Creswell, 2014). The interpretivist seeks to “understand, explain, and demystify social reality through the eyes of different participants” (Cohen, Manion, & Morrison, 2007, p. 19). In its extreme form, the interpretivist position is entirely subjectivist and individualist because it is deemed not possible to generalise beyond particular personal experiences of one person to another. This amounts to a negation of any pretence to scientific investigation of human thought and behaviour that seeks to make generalisations beyond the individual. This is widely viewed as a serious limitation of the interpretivist approach (Atieno, 2009; Mack, 2010; Nudzor, 2009). The extreme interpretivist position is rejected in this study because the social cognitive view of self-regulated learning encompasses multifaceted synergies that interconnect metacognition, affection, motivation, and behaviour of the learner. These occur in a social, cultural, and historical context which transcends an individual’s mind (D. Butler, 2011). Acknowledgement of this requires that qualitative research be engaged in to explore how these multifaceted synergies work together to form the whole (that is, self-regulation) within a flipped learning model. Indeed, Zimmerman (2008) insists on the need for the use of qualitative methods to further understand the affordances and constraints of learning environments (such as flipped learning) on students’ self-regulated learning. Therefore, conducting research within the qualitative paradigm is highly suitable for understanding the social context and learning environment of students’ self-regulated learning processes (Zimmerman, 2008).
Taking a constructionist-informed interpretivist approach in which experience “never simply speaks for itself” because the “language we bring to it determines its meaning” (Giroux, 1988, p. 99), it has been assumed that participants communicate their meaningful experiences using discourse relevant to the world they interact with. The study therefore endeavoured to capture the common sets of discourse that symbolise the common meanings the participants produce about their learning realities. In doing so, this study underlines the theoretical perspective of symbolic interactionism first developed by Herbert Blumer in 1937 (Blumer, 1986; Schwandt, 1994). Blumer argued that the three core assumptions of symbolic interactionism are: “that we know things by their meanings, that meanings are created through social interaction, and that meanings change through interaction” (Fine, 1993, p. 64).

In applying these three assumptions to this study, the participants acting within the flipped learning model were conceptualised as social agents who construct significant meanings about the learning environment, which then determine their actions to self-regulate their thoughts and behaviour. As per Crotty’s (1998) recommendation that researchers should seek to interpret a particular phenomenon through the eyes of the participants, this was attempted in the course of the research conducted in this study. In this respect, one must acknowledge and be mindful of one’s own potential biases and assumptions. By conducting a qualitative study, one had to be cognizant of the possibility that one’s own personal beliefs and perspectives about the self-regulated learning phenomenon within the flipped learning model could influence the way one interpreted the participants’ views (Denzin & Lincoln, 2011). By the same token, the explicit incorporation of one’s own “experiential data” was a valuable asset for generating insights and validity checks of this research (Maxwell, 2009, p. 225). However, one had
to remain, as far as possible, critically self-aware when referring to one’s own personal experiences (recorded in memo notes) as a part of interpreting the participants’ meanings.

In sum, by standing on constructionist philosophical terrain, and adopting interpretivism, a qualitative case study paradigm was deemed most appropriate for an empirical exploration of students’ perceptions as they sought to self-regulate their learning in a flipped learning model. In the following section the qualitative methodological paradigm and the methods selected for the study are discussed.

3.2.3 Qualitative case study

The case study approach was selected as a means of conducting an empirical investigation of students’ perceptions due to its compatibility with the theoretical underpinnings of this study—namely, symbolic interactionism. According to Miles, Huberman, and Saldaña (2014), a case is “a phenomenon of some sort occurring in a bounded context. The case is, in effect, [the] unit of analysis” (p. 28). As to a case study, there are multiple definitions in the literature (Creswell, 2009; Merriam, 2009; Stake, 1995; Yin, 2009). To Creswell (2009), a case study is

a qualitative strategy in which the researcher explores in depth a program, event, activity, process, or one or more individuals. The case [is] bounded by time and activity, and researchers collect detailed information using a variety of data collection procedures over a sustained period of time (p. 227).

Merriam (1988) defines a qualitative case study as “an intensive, holistic description and analysis of a single instance, phenomenon, or social unit” (p. 21). Yin (2009) proposes a technical definition of case study, viewing it as “an empirical inquiry that investigates a contemporary phenomenon in depth and with its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p. 18).
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The preferred approach for the research in this study is that proposed by Stake (1995). He argued that every disciplinary field is bounded within its unique system, and that researchers must view an individual case as a bounded system which they should inquire into “as an object rather than a process” (p. 2). Unlike Yin (2009), Stake (1995) defines case study research as an approach, not a methodology. For Stake (1995), “a case study is defined by interest in individual cases, not by the methods of inquiry used” (p. 86). That said, Stake (1995), Merriam (1988), and Yin (2009) are in agreement that case studies can portray a comprehensive framework of inquiry that enables in-depth investigation of a substantive case which possesses the capacity to address the complexities of a phenomenon. Butler (2011) argues that case studies exhibit considerable flexibility in design attributes that can accommodate a range of research purposes, but they have been commonly deemed as most appropriate to research that asks “how” and “why” questions of social agents (Stake, 2005; Yin, 2009). Stake (2005), in particular, argues that researchers should select a case study approach based on the particular kind of object to be studied, rather than a general methodological template. The object of the present study is higher education students’ perceived self-regulated learning processes in the flipped learning model, and so the case study approach has been adapted to that particular object.

There are different types of case studies that reflect the purpose of the study. Stake (2005) and Yin (2011) have named the types of case studies differently. To Yin (2011), case studies are either explanatory, exploratory, or descriptive; and single-case, holistic-case, or multiple-case studies. Stake (2005), on the other hand, classifies case studies as intrinsic, instrumental, or collective. This study applies Stake’s classifications of case studies.
3.2.4 Instrumental case study

As mentioned above, Stake (2005) defines a number of different types of case studies: intrinsic, instrumental, and collective (Denzin and Lincoln, 2005). An intrinsic case study is used when research is motivated by interest in a particular case in itself. On the other hand, when the purpose of the research is to generate insights about a particular phenomenon or context, the case study approach becomes instrumental. Stake (2005, p. 237) has suggested using an instrumental case study approach when “the case [in itself] is of secondary interest” because it only serves as a medium to help the researcher understand a specific topic. A collective case study is an instrumental approach that extends over multiple cases in order to show different perspectives in different contexts on a similar issue (Denzin & Lincoln, 2005). The ‘case’ in the present study is the insights that can be gleaned about the perceptions of self-regulated learning of a cohort of university students’ (enrolled in a pre-service teaching unit) operating in the flipped learning model. The choice of this type of case study was informed by the fact that although several studies reported a positive effect on students’ learning (e.g., Abeysekera & Dawson, 2014; Hamdan, McKnight, McKnight, & Arfstrom, 2013; Hoffman, 2014; McLaughlin et al., 2014; Slomanson, 2014), the success of this model apparently relies heavily on students’ self-regulation to learn on their own, which could be highly problematic (Strayer, 2012). Thus the primary focus of this study, i.e. the ‘case’ of interest, is on self-regulated learning within the context of a flipped learning model, and as such would be classified as an instrumental case study in Stake's (2005) methodological schema, rather than an intrinsic one (which would be primarily concerned with the unique participants themselves).
3.2.5 Scope of the case study

After determining the particular type of case to be investigated in this study, it was important to set the boundaries of the case to avoid an unmanageably complex, multi-factorial study (Creswell, 2003; Stake, 1995; Yin, 2011). Thus, a concrete context for a limited cohort of students over a specified period of time was required. The particular context purposefully selected for this study was a pre-service teaching unit administered by the School of Education at what shall be pseudonymously called “Sydney Sunshine University” (SSU) in Sydney, Australia. A summary of the unit description, the assessment tasks, and the learning and teaching schedule are available in Appendix A.

This particular unit was considered a critical site in which the self-regulated learning phenomenon could be effectively examined (Yin, 2011). The unit was one of the core units in a pre-service teaching program at SSU. It was run on three different campuses of the university simultaneously. The student population was highly diverse, as it comprised graduate and undergraduate, international and local students. Such an “information-rich case” was deemed appropriate for this study as it offered the possibility of insights into everyday life to answer the research questions from the perspectives of different cultures and learning styles (Patton, 1990, p. 169).

The instructional design of the unit was based on the flipped learning model, which can be described as a hybrid of face-to-face and online sessions. The flipped learning model had already been trialled for this unit by an experienced senior academic in the year prior to the present study. This academic (the Unit Coordinator) reviewed and reflected on its structure, content, and modes of delivery, and feedback from the instructors employed in the unit. In the light of feedback and reflection, the Unit Coordinator modified some aspects of the unit to better suit the flipped learning mode of delivery. These modifications included the provision of more scaffolding for the
students—for example, guided worksheets for online activities, Blackboard discussion boards, a welcome video, and mini lectures for each topic.

The flipped learning model for the current case study thus entailed a combination of face-to-face and online sessions. The face-to-face sessions were of two hours’ duration and occurred every fortnight for 14 weeks. The online sessions were conducted on a weekly basis for 14 weeks. The learning activities were designed to disseminate direct learning instruction outside the face-to-face learning space in order to maximise student-centred learning in class (Sams & Bergmann, 2013). Each portion of the flipped learning model (face-to-face and online) was designed to complement the other.

Students were fully informed at the beginning of the semester of the nature of the flipped learning model to be used in the unit, including its rationale, the online environment (Blackboard Learn) and its features, the various learning activities, the unit’s academic requirements, and the expected learning outcomes. This was done both in the introductory face-to-face sessions and via an introductory welcome video online. This information was also printed in the unit’s learning guide, which all students were encouraged to read.

The online materials were made available to the students to learn at their own pace and in their own time. Each week there was a pre-recorded mini-lecture by the Unit Coordinator delivered via YouTube. The videos were 5 to 10 minutes long and served as an overview of the content of each week. Captions and bullet points were incorporated into the videos to help non-native English speakers better understand the educator’s message (or highlight the main points to the students). Interactive presentations, comprising direct instructions developed by the educator, were also given using Adobe Captivate software. The presentations comprised multi-modal rich contents (e.g., textual content, illustrative images, and videos) to cater to different visual and auditory learning
styles, as well as pop-up quizzes. The presentations laid out weekly goals and the purpose of each week’s designated topic. The incorporated quizzes were used to direct the starting points for weekly learning activities. (For example, if students scored 80% or more on a quiz, they could proceed to more advanced learning activities. Otherwise, the presentation suggested basic content to scaffold students’ learning curve and boost weekly milestones. The presentations were also linked to some reading articles relevant to the weekly topics. Portable Document Format (PDF) worksheets were tailored to each week’s activities to help the students organise and summarise their notes and write their reflections. To add a social aspect to the online learning, students were also encouraged to use a discussion board to post questions, share ideas, ask for help, and support their peers. The online discussion board was moderated by the educator. To minimise distractions, all online learning materials were hosted exclusively on the unit’s Blackboard page. The online learning activities did not count towards students’ final grades.

The face-to-face portion of the unit was designed to promote a student-centred learning environment. In 2 hours, students were encouraged to engage in higher-order thinking tasks (e.g., discussion and collaborative activities) with their instructors and peers about the 2 weeks of learning materials they had covered at their own pace. This created the opportunity for students to analyse and apply concepts and get expert and peer feedback as needed. Individual conferencing was also available to struggling students. The three instructors assigned to the face-to-face classes were all seasoned tertiary-education teachers with previous experience of the flipped learning model.

There were two assignments, each of which was worth 50% of the total marks for the unit. The first assignment (argumentative essay) was due in the eighth week. The second assignment (case study report) was due at the end of the semester. Toward the end of the
semester, the students were required to participate in a 3-week practicum at a local school on which they based and then submit their case study report.

In sum, the flipped learning model used for the present study was carefully designed in accordance with findings in the current literature. The assurance of quality by the Unit Coordinator and the participating instructors was crucial to the interpretation of students’ responses in focus groups and interviews; that is, their experiences could not be attributed to idiosyncratic or defective design, implementation, or delivery of the flipped learning model, but rather was attributable to their experience of a well-functioning model.

3.3 Participants

3.3.1 Selection criteria

A key attribute of case study design is sampling selection, which involves the selection of participants, contexts, timeline, and events to form the case to be investigated (D. Butler, 2011). Since the primary aim of this study was to explore, understand, and gain insight into the role of the flipped learning model in enhancing self-regulated learning in higher education, purposive selection was used (Merriam, 2009).

Purposive sampling (also known as non-probability sampling) is a common technique in qualitative research, and according to Patton (2002) is a powerful tool for generating rich and in-depth data. It is defined operationally by Maxwell as a method by which “particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be gotten as well from other choices” (2009, p. 235). Patton (1990) identifies a number of techniques of purposive sampling (such as, deviant case, intensity, homogeneous, typical, and criterion sampling) that are considered useful for qualitative research. Among these purposive sampling techniques is criterion sampling: “The logic of criterion sampling is to review and study all cases that meet some
predetermined criterion of importance” (Patton, 1990, p. 176). Criterion sampling is considered to be a vital factor in qualitative research for studies that monitor participants over a period of time. The present study monitored each participant over a 14-week period. The criterion sampling technique was thus deemed to be most appropriate for this study.

The criteria used for recruiting participants to this study were: (a) participants should be enrolled in the same unit, to avoid variance of instructional content and teaching approaches; and (b) participants should form a diverse sample of age, gender, ethnicity, and number of years of tertiary education experience. With respect to (b) in particular, the ideal criteria were specified as follows: “there should be an even spread of ages of participants ranging from 18 to 50 years old”; “half the participants should be male and female respectively”; “each participant has a different cultural or ethnic background to other participants”; “an even spread of semesters of tertiary education enrolment”; “an equal division of participants’ experience of previous educational attainment (from high school to university degree)”; “an equal division of participants in terms of current employment (not working, working part-time, working full-time)”; and “there was an equal division of students who had prior experience of flipped or blended learning, and those who had not experienced such a pedagogical approach”. These ideal criteria determined the recruitment procedures for selecting participants who were likely to be information rich. In practice, these ideals could not be expected to be fully satisfied given the limited size of the pool of potential participants, and thus the selection of the participants was guided, rather than dictated, by the criteria. In this respect, an aspect of convenience sampling was inevitable.

As shown in Table 3-1, all the selection criteria were satisfied within tolerable ranges, except for gender sampling. Since the pre-service teaching unit catered for the
kindergarten and primary school job market, the population of possible participants was heavily skewed to the female gender. Such units attract significantly more female than male students. This is borne out by Weldon's (2015) labour market study which found that 80% of primary school teachers in Australia are female. Thus, the number of male students available for recruitment to this study was relatively small, and none of them showed any interest in participating.

3.3.2 Recruitment procedure

As a preliminary step in the recruitment process, an invitation to participate in this study was extended to the students enrolled in the pre-service teaching unit at SSU that applied the flipped learning model in the spring semester of 2015. The invited students were enrolled in the unit at three different campuses of SSU (hereafter Campus 1, Campus 2, and Campus 3). At Campuses 1 and 2 there were two classes within each unit, while Campus 3 had four classes.

Two invitation methods were used. First, I went to all eight of the unit classes on all three campuses and gave a brief presentation about the study and the nature of potential participants’ involvement in the research activities. After the presentation, I gave each student (N=204) a copy of the study invitation letter, a participation information sheet, a consent form, and an empty envelope. The purpose of the envelope was to protect the identity of the students. I asked the students, if they were interested, to enclose the consent form in the envelope and leave it sealed in a box that I put near the door to the classroom. After giving the instructions to the students, I left the class and came back to collect the boxes after all students had left. The instructors thus did not have any information about the identity of the students who expressed interest in participating in the study.
At the beginning of the semester, the Unit Coordinator and I went to the eight unit classes on the three campuses. On February 23, 2015, we went to Campus 1 where the Unit Coordinator introduced me to the tutor of the two classes and her students. The Coordinator showed her enthusiasm and support about the study as she talked for over a minute. I believe that students misinterpreted her message and felt that they were obligated to participate. As a result, I received a few envelopes with unsigned consents and some unsolicited comments from students. The notes reflected these students’ discomfort about participating, believing it would impact their final grades. This issue was addressed immediately in the case of the other two campuses. The Unit Coordinator was not directly involved in the recruitment invitation at these campuses; she only introduced me to the class and I then took the lead. Thirty-two students expressed interest in participating in the study via this recruitment method.

I allowed some flexibility for students who asked me for some time to consider their participation by using a second, alternative method of recruitment. After 3 weeks, I sent a web-based invitation to the same unit classes using SurveyMonkey. I asked the Program Coordinator to post the study invitation link on the unit’s online Blackboard page, which was accessible to all students enrolled in the unit across the three campuses. Four participants lodged their consent using this online method.

As a result of using both methods of recruitment, of the 32 participants to expressed interest in the study, a total of 26 recorded their consent to participate. However, in the third week of the semester six participants withdrew from the study. The students contacted me via email, text message, and in person to express their desire to discontinue their involvement in the study. All six students who withdrew were first-year students who expressed concern, on reflection, that they would be overburdened if they
participated in the study. I did not impose any pressure on the students to reconsider their decision, and removed their information immediately from my database.

Ultimately, a total of 20 female participants enrolled in the pre-service teaching unit that applied the flipped learning model were recruited for this study. One participant was located at Campus 1, ten were located at Campus 2, and eight were located at Campus 3.

3.3.3 Demographic profile of participants

It was intended that the sample of participants should reflect a diversity of perspectives on pedagogical experiences. This diversity was indeed reflected in the demographic profile of the final sample (with the exception of gender).

The demographic information about the recruited cohort was collected from participants using a SurveyMonkey survey. The key demographic characteristics identified were: age (in years), self-identified ethnicity, the level of degree enrolled in, the number of semesters already enrolled in their degree, prior experience with a flipped learning model (yes/no), prior experience with online or blended learning (yes/no), prior level of education, and employment status. Table 3-1 summarises the participants’ profiles.
Table 3:1 Demographic profile of participants

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Age</th>
<th>Ethnicity</th>
<th>Degree enrolled in</th>
<th>Semesters enrolled</th>
<th>Flipped learning experience</th>
<th>Online-blended experience</th>
<th>Prior education</th>
<th>Employment status</th>
</tr>
</thead>
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<tr>
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<td>Yes</td>
<td>High School</td>
<td>Part-time</td>
</tr>
<tr>
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<td>Diploma</td>
<td>Part-time</td>
</tr>
<tr>
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</tr>
<tr>
<td>Chun</td>
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<td>Chinese</td>
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<td>Yes</td>
<td>Adv.Diploma</td>
<td>Part-time</td>
</tr>
<tr>
<td>Daisy</td>
<td>22</td>
<td>N. Zealander</td>
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<td>No</td>
<td>Diploma</td>
<td>Not working</td>
</tr>
<tr>
<td>Divina</td>
<td>23</td>
<td>Australian</td>
<td>B Arts</td>
<td>4</td>
<td>No</td>
<td>Yes</td>
<td>Diploma</td>
<td>Part-time</td>
</tr>
<tr>
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<td>No</td>
<td>Yes</td>
<td>High School</td>
<td>Part-time</td>
</tr>
<tr>
<td>Fang</td>
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<td>Chinese</td>
<td>B Arts</td>
<td>4</td>
<td>No</td>
<td>No</td>
<td>High School</td>
<td>Part-time</td>
</tr>
<tr>
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<td>Part-time</td>
</tr>
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<td>No</td>
<td>Diploma</td>
<td>Part-time</td>
</tr>
<tr>
<td>Grana</td>
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<td>B Arts</td>
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<td>Diploma</td>
<td>Part-time</td>
</tr>
<tr>
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<td>Part-time</td>
</tr>
<tr>
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<td>Diploma</td>
<td>Part-time</td>
</tr>
<tr>
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<td>Pakistani</td>
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<td>Yes</td>
<td>High School</td>
<td>Not working</td>
</tr>
<tr>
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<td>Diploma</td>
<td>Part-time</td>
</tr>
<tr>
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<td>Australian</td>
<td>M Teaching</td>
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<td>No</td>
<td>Yes</td>
<td>Diploma</td>
<td>Full-time</td>
</tr>
<tr>
<td>Ruby</td>
<td>21</td>
<td>Australian</td>
<td>B Arts</td>
<td>1</td>
<td>No</td>
<td>No</td>
<td>Diploma</td>
<td>Part-time</td>
</tr>
<tr>
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<td>B Arts</td>
<td>1</td>
<td>Yes</td>
<td>Yes</td>
<td>Diploma</td>
<td>Part-time</td>
</tr>
<tr>
<td>Ting</td>
<td>20</td>
<td>Australian</td>
<td>B Arts</td>
<td>3</td>
<td>No</td>
<td>Yes</td>
<td>High School</td>
<td>Part-time</td>
</tr>
<tr>
<td>Xia</td>
<td>25</td>
<td>Chinese</td>
<td>M Teaching</td>
<td>3</td>
<td>No</td>
<td>Yes</td>
<td>Bachelor</td>
<td>Part-time</td>
</tr>
</tbody>
</table>
The sample consisted of 20 female students whose ages ranged from 18 to 49 years. The majority of students fell within the 21 to 29 age range, representing 47% of the recruited sample. Thirty-six per cent of participants were between 18 and 20 years of age. The remaining 10% and 5% of participants ranged in age from 30 to 39 and 40 to 49 years of age, respectively. Although this did not meet the ideal criterion for a perfectly even spread of ages from 18 to 50, it was decided that for practical purposes, a sufficiently diverse age range was represented by the sample.

The ethnicity of the participants was based on self-identification—that is, participants nominated their own ethnic identity. An examination of the pool of possible participants in the unit revealed that there was a fair degree of ethnic diversity among them. This provided grounds for believing that a sample of them, even if self-selecting, could potentially satisfy the criterion of ethnic diversity to a tolerable degree. As it turned out, 11 of the participants (55%) identified themselves as Australian. The remaining 45% of participants identified themselves as being of some other (non-Australian) ethnicity or nationality. They identified their ethnicity along national lines. Of these, the majority were from the Asian continent: three Chinese, one Indonesian, one Japanese, and one Pakistani. The remaining three participants identified as Brazilian, Congolese, and New Zealander.

With respect to employment status, one student (5%) reported that she worked in a full-time job, while 16 students (80%) indicated that they worked in part-time jobs, and three students (15%) were not working (that is, not employed and not actively seeking work). Again, this did not meet the ideal of an even division of employment status, but it was decided that for practical purposes, there was satisfactory diversity in employment status because at least each type of status was present in the sample.
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I also collected information related to participants’ educational profiles—namely, the degree programs they are currently enrolled in; their previous experiences with flipped, online, and blended-learning units; and their prior level of educational attainment.

Sixteen participants (80%) were enrolled in a Bachelor of Arts degree (pathway to teaching, birth–5, or birth–12). Four of the participants (20%) were enrolled in the Master of Teaching program. This was to be expected given the usual make-up of the cohort of students enrolled in such a course.

Eight of the participants (40%) were enrolled in their first semester at the university. Seven of the participants (35%) indicated that they were in their second or third semester in their degree. Five of the participants (25%) were enrolled for the fourth semester or later of their degree. This came close to matching the ideal criterion for diversity in tertiary education experience in the course.

The participants also reported on their prior experiences with online units and/or the flipped learning model. The majority of the participants (15 students; 75%) reported having some experience of online or blended learning, but of these, only four (20%) reported having prior experience with the flipped learning model. The remaining five students (25%) did not have any prior experience with online or blended learning.

With respect to the level of educational attainment of the participants prior to enrolling in the courses at the university, the majority of participants had completed a vocational education and training program: ten (50%) had completed a diploma and two (10%) had completed an advanced diploma. The next largest group (six students; 30%) had only completed high school. Of the remaining two participants, one had completed a Master of Linguistics and the other had completed a Bachelor of Music.
3.4 Data Sources and Collection Procedures

3.4.1 Pilot study

Although discussion of pilot studies is limited in qualitative research literature (Y. Kim, 2011), such studies can be useful for interpreting a theory or a concept in a given context (Maxwell, 2008). Pilot studies are generally used to identify potential conceptual, methodological, and practical problems before a “main” study is conducted (Miller et al., 2007; Teijlingen & Hundley, 2002). Pilot studies can be valuable in assessing a study’s feasibility, checking the effectiveness of the recruitment procedures, and testing the data-generating methods of a study. Thus, prior to the commencement of the main study, a pilot study was conducted with three participants in a graduate unit during the summer term of 2015. The unit was selected because it exhibited similar characteristics to the flipped learning model concept. This pilot study sought to achieve the following goals. The first goal was to check the feasibility of interviewing participants to understand how they perceived that the unit instructional design might impact on their self-regulated learning (Schober et al., 2015). The second goal was to identify useful methods of recruitment for the subsequent “main” study. The third goal was to test the comprehensibility of the interview questions, and to make any necessary methodological adjustments for the actual study. This pilot study proved valuable because it unearthed a range of problems. This section reflects on those problems and the lessons learned from them that informed the conduct of the subsequent actual study.

First, recruiting students who were willing to participate in the study proved difficult. The primary reason for non-participation cited by students was the fact that their time was already full occupied with studying other units and/or working in part-time or full-time jobs. In an attempt to overcome this problem when
implementing the main study, in addition to a hard copy of the participant survey to be completed on-campus, I created an electronic version which students could complete at their leisure if they wished. The electronic format would enable students to complete the survey at a time which was convenient to them, and would give them time to reflect on their responses before submitting their response.

Second, ensuring the full participation of the pilot recruits proved somewhat difficult. One of the three participants did not show up for their interview. The potential dropout rate was thus considered a problem that might put the main study at risk. To counter this problem in the main study, it was therefore deemed important to gather more respondents than required, in order to allow for potential no-shows.

Third, one technical problem was encountered when conducting the interviews with the pilot participants: I failed to switch the audio recorder from “pause” to “record” during the interviews, and therefore had to conduct the interviews a second time. The participants agreed to be interviewed again without objection or complaint; however, I was concerned that their responses in the second interview may have differed from those in their first interview, simply because the participants now knew what the questions would be and the answers of other participants, and may have altered their answers in response. In any case, the lesson here was to double-check that equipment would always be working properly in the main study.

Successful completion of the pilot study was not a guarantee that the actual study would be without problems (Teijlingen & Hundley, 2002). For example, the pilot study might not have been sufficient to highlight any logistical problems of dealing with larger numbers for the full-scale study. Nonetheless, the pilot study highlighted the importance of the contextual elements such as workload and accessing classroom time that could hinder the smooth conduct of the study. The
pilot study was also effective in demonstrating that the questions initially designed
to gather the information were framed appropriately. Further, experience with the
pilot study provided guidance as to how to restructure the research approach such
that it would be more effective in the main study. For example, I was planning to
conduct two focus groups and one semi-structured interview during the semester.
However, I realised that I was not able to explore participants’ individual self-
regulated learning differences in depth during the focus group interview. According
Therefore, the focus group questions covering the global instructional design and
social aspects of self-regulated learning were reconsidered for the main study. For
example, questions like “What kind of learning process do you go through in order
to complete a task?” were eliminated from focus groups. This alteration was made
to avoid focusing on a narrative of personal experiences and to reorient attention to
negotiating opinions and beliefs about the flipped learning model (Lambert &
Loiselle, 2008). A question like “How have you found the learning experience in the
flipped learning model of this unit?” was deemed more suitable to extract
participants’ opinions and views about the learning environment (Lambert &
Loiselle, 2008) (see Appendix E). Additionally, in the pilot study it became apparent
that it would be necessary to conduct two individual interviews with each participant
in order to capture each student’s self-regulated learning processes during the
semester. Recording participants’ experiences at only one time, and then
extrapolating those experiences across a whole semester is problematic (Webster &
Hadwin, 2015). Identifying whether students’ self-regulation skills and behaviour
changed over the course of the semester could not be adequately achieved if there
were only one interview. Thus, the first interview was conducted late in the first half
of the semester (after students had completed their first written assignment), and the
second interview was conducted at the end of the semester. The first interview focused on the self-regulated learning strategies that participants used to complete a task (i.e. Assignment 1). This interview included questions such as: “*How did you plan for your essay writing?*” (see Appendix F). The second interview aimed to capture the participants’ self-reflection about their own learning in the flipped learning model. An example of the kind of questions asked here is: “*What have been the benefits/challenges of learning on your own in this unit?*” (see Appendix G).

In conclusion, the pilot study provided valuable experience, which enabled further development of the tools, formats and procedures that were used to effectively conduct the main study by ensuring they were well suited to the participants. The pilot study thus proved to be invaluable in terms of preparing for the actual study. Many potential risks were identified and strategies were developed for reducing their impact on the study. For the record, it should be noted that the students who participated in the pilot study were not participants in the actual study of 20 recruited students.

3.4.2 Data collection methods and timeline

The three types of qualitative data collection methods used in the post-pilot main study were: (a) online *semi-structured* learning reflections, of which there were three, staggered evenly throughout the semester; (b) focus group interviews, held in the first half of the semester; and (c) in-depth individual interviews, of which there were two per student in the second half of the semester. To complement the qualitative data collection tools, trace data were used as a supportive quantitative source of data to examine the participants’ online engagement during the semester. Figure 3-2 illustrates the precise positioning of online semi-structured learning reflections, focus groups, and in-depth individual interviews during the semester,
and each is explained in the following sections. The grey bar in the centre of Figure 3-2 shows the timeline (in months). Each of the tools of data collection (i.e., the pilot study, learning reflection 1, focus groups, learning reflection 2, in-depth interviews 1, learning reflection 3, and in-depth interviews 2), and the periods (start and end) over which it was utilised, are indicated by the orange bars running parallel to the timeline.

![Data Collection Timeline](image)

**Figure 3-2 Data collection timeline**

3.4.3 Learning reflections

The first data collection method consisted of online semi-structured learning reflection. This method was employed to understand how the participants apply self-regulated learning strategies to support their learning in the flipped learning model.
Students were asked to record (write down) their learning experiences over specified periods of time (see Figure 3-2) and then to send their reflections to me by email. Students were not given any maximum or minimum word limit. These submissions occurred three times during the semester. The three learning reflections were strategically distributed throughout the semester to address specific learning activity. See Appendices H, I, and J for the specific questions and instructions.

To facilitate in-depth interpretation of the learning reflections, the reflections were required to be completed prior to focus groups and individual interviews. Participants were asked to record their learning plans, strategies for task completion, and reflections on their learning in the flipped learning model. Students were asked, for example: “What are your goals for Week 3?” (learning reflection 1; see Appendix H); “What sorts of strategies did you use this week to support your understanding of Assignment 1 requirements?” (learning reflection 2; see Appendix I); “To what degree did you become an independent learner in this unit? What aspects helped or could have helped you to gain learning independence?” (learning reflection 3; see Appendix J). This allowed me to take the findings into account when developing in-depth interview questions.

The first learning reflection was sent to the participants in the second week of the semester. It was hoped that this would provide some insight into the participants’ learning plans for the week 3 learning topic, how they managed their learning, and how they anticipated their learning performance. The second learning reflection focused on the participants’ self-regulated learning strategies used to complete Assignment 1 (an argumentative essay). The participants reflected on their successful and unsuccessful strategies, their motivational and emotional reactions when encountering difficulties, and keeping records of their learning experience. The last learning reflection focused on how the participants perceived taking
responsibility for their learning, what they learned about themselves as learners, and what aspects of the flipped learning model contributed to their learning independence.

3.4.4 Focus group interview

Based on the constructionist paradigm, this case study sought to interpret the participants’ own realities relating to the ways in which the flipped learning model promoted their self-regulated learning (Wilkinson, 1998). Focus group interviews are a common method used in case studies to extract the essence of these multiple realities (Stake, 2005). A focus group is a very useful tool because it empowers participants to express their own views while being stimulated by the views of others within the group, which adds richness to the data being generated (Robson, 2002). It creates an interactive and dynamic environment that enables exploration of the consistency of shared views related to self-regulation and the flipped learning model. There are, nonetheless, a number of potential limitations of focus group interviews that had to be taken into consideration. These include the possibilities of: some participants’ voices dominating and thereby skewing discussion; the interviewer being viewed as an “outsider”, leading to “self-censorship” on the part of participants when discussing issues of concern to them; and conflicts and arguments between participants, moving discussion away from the issues of interest to the study and/or undermining a collegial atmosphere of open discussion (Parker & Tritter, 2006; Smithson, 2000).

Because of the above potential limitations, the focus group interviews required thoughtful planning in advance in order for useful and rich data to be generated (Stake, 2005). Interview questions were refined after the pilot study. For example, students were asked questions like: “What do you expect from your instructor/tutor
when you come to the face-to-face portion of flipped learning unit?” Furthermore, it was decided that there should be questions about the role of the learner, as this dimension was absent from the pilot focus group interview. Thus, two questions were asked on this topic: “What do you think is the role of the instructor in your opinion?” and “What do you think is your role as a learner in the flipped learning model?” (see Appendix E). This enabled me to give the participants the opportunity to better express their views related to their learning experiences in the flipped learning model (Creswell, 2003). To avoid the problem of particular voices dominating, as a moderator I endeavoured to ensure that all participants had the opportunity to express their views on each topic discussed. To avoid being classified as an “outsider” or “the Other”, I dressed in the same informal manner as the participants, used ice breakers, and spoke with a casual and conversational—rather than an inquisitorial—tone. As for the potential issue of conflict, although some participants had differing opinions, these did not progress to the level of conflict. In any case, disagreement in a focus group can be a positive feature of the method as it enables a diversity of views to emerge (Smithson, 2000).

In total, I conducted six focus group interviews across the three campuses at SSU. For the participants’ convenience, the focus groups took place in the campus library study rooms. In order to extract in-depth information from the participants, each group comprised only three to four participants (Barbour, 2008, p. 60). This number allowed me to attend to all members of the group and provide opportunities for all participants to share their learning experiences in the flipped learning model. On average the focus group interviews went for one hour (with a variation of ±15 minutes). All focus groups were recorded, with the consent of the participants.

Scheduling a time that is convenient to all participants is one of the challenges of focus group interviews (Spruce & Bol, 2015). Initially, I emailed the participants
to propose three different time slots for attending the interview meeting and experienced some response delays, as students did not check their emails on a regular basis. Another issue related to time conflicts, as students were taking other units in addition to the flipped learning unit. My original plan was to divide participants into four to five groups, but due to time constraints this was not possible and I organised six focus groups instead. (There is no reason to believe that this change had any impact on the content of the discussions, and thus the quality or content of the data collected.)

The focus group interviews aimed to draw out the participants’ perceptions relating to the flipped learning model as a learning environment and how it would support their self-regulated learning. The interviews were focused on the following points: (a) learning expectations of the unit, (b) self-regulated learning experiences, (c) negotiating the shared responsibilities of learning between the learner and the instructor, (d) self-regulated learning attitudes toward the online materials, (e) factors that impacted self-regulated learning, and (f) the synergy between the online and face-to-face portions of the unit.

During the focus groups, I moderated the participants’ discussion to give equal opportunity for all group members to contribute. For audio quality assurance, I encouraged them to speak clearly and one at a time. When participants expressed an interesting point of view that I felt required further discussion with the individual participant, I made a note of the participant’s commentary and saved it for the one-to-one interview.

3.4.5 Semi-structured interviews

Lambert and Loiselle (2008) suggest that combining individual interviews with focus groups improves data richness. They assert that each method complements the
other by expanding the breadth and depth of the findings. Given the difficulties of observing the cognitive aspects of people’s emotions, thinking, and goals, interviews can provide a window into another person’s viewpoint (Patton, 1990). Hence, the semi-structured interview is an integral source of data that elicits realities from the perspectives of the individuals concerned (Yin, 2011). When conducting the interviews, I attempted to interpret the phenomenon of self-regulated learning from the perspective of the participants’ experience of the flipped learning model (Crotty, 1998).

Compared to the structured interviews that are commonly used in studies of self-regulated learning (Zimmerman, 2008), semi-structured interviews are conducted in a more conversational fashion between interviewee and interviewer (Yin, 2011). This approach was deemed appropriate due to the importance of capturing the personal realities of the participants in order to obtain insights about how students interpret self-regulated learning processes in the flipped learning model. Thus, in this study, semi-structured interviews were conducted after the focus groups. The interviews were used to explore what self-regulatory strategies participants used for task completion (i.e. interview 1) and how the participants perceived their learning in the flipped learning environment (i.e. interview 2). Two series of semi-structured interviews were used to extensively examine individual self-regulated learning experiences and strategies. As such, I needed to be a patient and careful listener who made considerable efforts to hear, record, and respond to the participants’ responses (Yin, 2011). This task was deemed to be taxing on myself, so, to conduct interviews with a fresh mind, I did not conduct more than four per day.

Based on my prior experience of scheduling focus groups times, an online booking service was used (https://youcanbook.me/). This enabled the sending of possible interview times in a link to the participants using mobile phone text
message, and participants were able to book a time slot that was convenient for them. After making a booking, an automatic message was sent to both the participant and myself confirming the appointment. Like the focus groups, all interviews were conducted at the library study rooms located on the three campuses of SSU. Each interview took between 60 and 90 minutes to complete and was audio recorded, with the consent of the participants.

All 20 participants attended two individual interviews, which were conducted during the semester in order to reveal whether there had been a change in students’ self-regulated learning and in their perceptions of the flipped learning model as the semester progressed. (If only one interview were conducted, it would be problematic to assume that responses in those interviews applied throughout the entire semester, without any change (Webster & Hadwin, 2015). The first series of interviews occurred between April and May 2015. These interviews aimed to explore the participants’ engagement in the Pintrich areas and phases of self-regulated learning (i.e., forethought, monitoring, control, and self-reflection) (Pintrich, 2004). These phases were used to structure the interview conversations between individual participants and myself, with specific questions covering strategic planning (e.g., “What steps did you set for yourself to complete the assignment?”), management of resources (e.g., “What resources did you use?”), and management of environment (e.g., “Where did you plan to write? Was it suitable? Why?”) (see Appendix F).

Towards the end of the semester (June and July, 2015), a second series of interviews was conducted (again with all 20 participants) to explore the participants’ overall reflections on the flipped learning model. These interviews covered the following topics: (a) learning responsibility transfer, (b) self-regulated learning
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persistence, (c) challenges and rewards of the self-regulated learning process, and (d) performance self-evaluation (see Appendix G).

3.4.6 Trace data

Karabenick and Zusho (2015) have suggested incorporating trace data as a complementary tool to interviews in order to obtain a comprehensive view of self-regulated learning. Trace data provide a record of students’ behaviours while interacting with the unit’s content online (via Blackboard Learn) in the flipped learning model (Hadwin et al., 2007). These logs can be used to see if there were any associations between students’ self-regulated learning strategies and academic outcomes (Zimmerman, 2008). For the purpose of this study, Blackboard Learning Analytics was used as a trace data tool.

Using this tool enabled the construction of participants’ profiles of learning activities that occurred in the online portion of the flipped learning model unit. The Blackboard system enabled the generation of reports of the participants’ self-regulated learning behaviour with respect to the following dimensions: (a) patterns of learning, (b) regularity of learning events, and (c) time of online engagement. Data generated from Blackboard Learning Analytics were then used to provide insights into students’ self-regulated learning processes (such as frequencies and times of engagement) and to make inferences about students’ self-regulatory strategies (Wolters, Benzon, & Arroyo-Giner, 2011) that were used during the learning process in the flipped learning model unit. A further advantage of using trace data is that they generate information about students’ actual behaviour in temporally distant situations (Zimmerman, 2008).
3.5 Data Analysis

The data analysis was an iterative process to promote comprehensiveness of the study findings (Creswell, 2013). The preliminary analysis and data collection were conducted concurrently. This provided more flexibility to attend to emerging issues of self-regulated learning and the flipped learning model as the data collection process progressed. For example, some themes were identified during data collection using one of the tools (students’ learning reflections), which enabled the development of more in-depth interview questions.

The purpose of data analysis is to interpret the participants’ views in a meaningful way. To achieve this goal, Miles et al. (2014, p. 12) suggests four “nodes” of data analysis: data collection, data condensation, displaying of data, and conclusion drawing/verification. The four nodes interact concurrently with each other throughout a research study. Figure 3-3 illustrates the interactive model of data analysis components suggested by Miles et al. (2014).

![Figure 3-3 Components of data analysis: Interactive model](image)

Note. Adapted from Miles, Huberman, and Saldaña (2014, p. 14).
I learned to move back and forth between these four nodes while collecting the data. At the same time, I attempted to conceptualise the emerging codes (condensation), then organise and compress rich information (data display), to be able to interpret the affordances of the flipped learning model in promoting self-regulated learning behaviour (drawing and verifying conclusions).

3.5.1 Data preparation

The data from this study were generated from an array of sources, and were then organised for analysis. All forms of data were transformed into text documents to facilitate the analysis process. Audio recordings of the participants’ focus-group and in-depth interviews were transcribed. Participants’ learning reflections were collected via the SurveyMonkey online survey software and by email (depending on what was most convenient for individual participants). At the end of the semester, the learning analytics reports of the participants’ online activities that had been recorded during the semester were collected and saved in PDF format. All data documentation was stored on my personal computer with password protection.

3.5.2 Coding and data condensation

The process of coding was carried out using the NVivo 11 for Windows qualitative software (QSR, 2016). The analysis of large amounts of unstructured or qualitative data can be laborious and time-consuming and software packages such as NVivo can reduce the time spent on this task and help researchers to “organize, analyse and find insights in unstructured, or qualitative data” (www.qsrinternational.com). The use of computer assisted qualitative data analysis software (CAQDAS) of this type has become widespread in recent years and is valued by many qualitative researchers for the ways in which it facilitates the
organisation of sources based on relevant characteristics, the categorisation of data by themes, the ease of searching for and retrieving relevant material, and the development of visual representations of the data (Talanquer, 2014). Other documented benefits of using this type of software include improved accuracy of results due to the software’s more systematic coding and analysis process (Lee & Esterhuizen, 2000) and its provision of an audit trail of the data analysis process, which can be used by others in judging the methodological standards of the study (Welsh, 2002).

The overall approach to coding in this study was based on a combination of thematic analysis and selective coding. These also correspond in broad terms with inductive and deductive approaches to coding. Deductive (or a priori) coding involves allocating research material to predefined categories related to a theoretical framework or specific research questions, and is generally used for testing existing theories or examining their applicability to a particular context (Zhang & Wildemuth, 2009). The use of established themes or codes also means that the findings can be compared with similar studies conducted in different settings. Selective coding using a deductive or “top-down” approach was deemed to be most appropriate for use in addressing sub-research question 1 of this study, which is intended to provide evidence of the kind of self-regulated learning that occurs in the flipped learning model, based on the self-regulated learning framework developed by Pintrich and Groot (1990).

In contrast, inductive coding is most often used in research conducted within the interpretivist/constructivist theoretical paradigm, which focuses on understanding phenomena from the perspective of individual realities. This approach was therefore used to address sub-research question 2 of this study, which is concerned with understanding learners’ experiences of the flipped learning model in order to gain
insights into the factors influencing these experiences and the ways in which flipped learning promotes or hinders self-regulated learning. This part of the study was intended to generate new understanding of the nature of self-regulated learning and how flipped learning programs can influence this; as such, it was not appropriate to identify the research themes in advance. Instead, inductive coding involves identifying themes and sub-themes relevant to the research questions from the research data itself, and allocating these to corresponding codes and sub-codes.

The analysis and interpretation process is highly iterative in the inductive approach: several stages of coding are commonly involved and themes are added or modified over time to reflect the researcher’s growing understanding of the data. For example, Saldaña (2015) recommends coding data in two main cycles. The first cycle is the preliminary stage for dealing with raw data and assigns initial codes to data chunks. In the second and any further coding cycles, coding patterns are examined in order to develop a thematic conceptualisation and organisation of the data (Saldaña, 2015). Using this approach and adhering to the constructionist epistemology, the data was examined using an inductive approach to avoid imposing personal assumptions onto the themes and to ensure that the overall allocation of data against codes (coding tree) most accurately reflected the participants’ own experiences as these relate to the research questions.

3.5.3 Data display and theme allocation

Following the deductive and inductive coding methods described in the previous section, a coding tree was developed, in which the research data were allocated to key themes and sub-themes that were either defined in advance (sub-research question 1—RQ1) or emerged as important and relevant to the study (sub-research questions 2 and 3—RQs 2 and 3). Tables 3-2 and 3-3 show the final coding
schemes, along with extracts of relevant material relating to each sub-theme. The arrows above each table indicate the main direction of the coding process used in each case. The double-headed arrow above Table 3-3 reflects the partly-deductive process used for addressing sub-research question 2, since this was not a completely open coding process: the research questions determined the scope of the analysis and coding.
### Table 3:2 Coding tree for RQ1

|-----------------------------------------------------|------------------------------------------|---------------------------------------------|----------------------------|
| **Motivational strategies**                         | Goal orientation                         | Extrinsic goals                             | “I just want to pass and complete everything”  
“| “I always want eighty or above” | |
| Intrinsic goals                                     |                                          | “It’s about furthering your knowledge”      | “I always want to learn” |
| Task value                                          |                                          | “[T]his course will get you into centres”  | “I’m paying all this money”  
“Not any of those [subjects] relate to that field at all. They’re irrelevant”  
“[I]t’s a waste of time” |
| Expectancy                                          | Control beliefs                          | “Students have to be self-directed”        | “[I]f you want to pass the unit you need to do the work”  
“Everything is based on your teacher it’s not about your ability” |
| Self-efficacy                                       |                                          | “I expect to do well”                       | “I think for me it is a bit easy”  
“I’m not highly academic” |
| Affective                                           | Assessment anxiety                       | “I have been very stressed out”            | “I was worried about the mark”  
“I just hate that feeling … I don’t want to have that anxiety” |
| Satisfaction                                        |                                          | “I think satisfied [with the job I did]”    | “I was actually pretty proud of myself that I got it done” |
| **Learning strategies**                             | Rehearsal                                | “I went through the online materials and the worksheet before I come to class and wrote down questions for clarification” |
| Elaboration                                         |                                          | “I had more knowledge on that from doing my prior learning at TAFE”  
“I tried to reuse articles that the unit have already encouraged us to read” |
| Organisation                                        |                                          | “For me it’s all like a timetable, so breaking down what I have to do”  
“There were examples online. I used that as a basis for my structure” |
<table>
<thead>
<tr>
<th>Critical thinking</th>
<th>“I … add in my own thing to make it more interesting” “[T]hose questions make you think”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metacognitive self-regulation</td>
<td>Planning</td>
</tr>
<tr>
<td>Monitoring</td>
<td>“[D]uring writing my assignment I would constantly check my marking criteria” “I kept referring back to what the guidelines were saying”</td>
</tr>
<tr>
<td>Regulation</td>
<td>“[A]fter reading and … studying the paragraphs, I changed it around to make more sense” “I re-read it and see where I can add things”</td>
</tr>
<tr>
<td>Resource management strategies</td>
<td>Time and study environment</td>
</tr>
<tr>
<td>Environment</td>
<td>“I try to come to the library once in the weekend … there is no distraction around me” “I need to have something going on in the background whether it’s music or …”</td>
</tr>
<tr>
<td>Effort regulation</td>
<td>“I didn’t actually touch my phone—I just focused on my assignment” “I would stop … just go out, and have a drink of water or something and then come back in and try to get my head around it again”</td>
</tr>
<tr>
<td>Peer learning</td>
<td>“I think this approach … is personally… more beneficial for the students to learn” “I got more in 10 minutes conversation than I did about three weeks of the online work”</td>
</tr>
<tr>
<td>Help seeking</td>
<td>From teachers</td>
</tr>
<tr>
<td>From peers</td>
<td>“I … ask my friends instead because they give me quicker feedback” “[W]e go to each other for clarification”</td>
</tr>
</tbody>
</table>
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From others
“I … give it to my parents or my brother to read it for me”
“Because they have no professional background, they don’t understand sometimes”

<table>
<thead>
<tr>
<th>Examples of relevant text</th>
<th>Sub-themes</th>
<th>Main themes</th>
<th>Research question</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I am an independent learner, as I find it easier to study and learn by myself”</td>
<td>Learning style and preferences</td>
<td>Student-related influences</td>
<td>What are the factors that influence self-regulated learning in the flipped learning model?</td>
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<tr>
<td>“I like to understand before I go to class … read over it and understand”</td>
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<tr>
<td>“I just don’t learn that way. I’d rather go out and do something practical and interesting and engaging”</td>
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<td>“Readings do take a lot of time. I think I take three times as much as local students do”</td>
<td>Skills and abilities</td>
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<td>“My writing lets me down a lot”</td>
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<tr>
<td>“I’ve always been a procrastinator”</td>
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<tr>
<td>“When I get into something then I really go for it”</td>
<td>Level of interest and motivation</td>
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<tr>
<td>“Sometimes the interest wasn’t there”</td>
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<tr>
<td>“Your kids take up most of your time and you basically won’t be able to do anything until they are asleep”</td>
<td>Time constraints and other commitments</td>
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<tr>
<td>“We’re not just uni students we have you know … we might have jobs … we have families and everything”</td>
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<tr>
<td>“So the first week online and then the second week face-to-face and I think both they blend together pretty well”</td>
<td>Program structure</td>
<td>Program-related influences</td>
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<tr>
<td>“The span of two weeks, that’s a bit too long to retain the memory”</td>
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<td></td>
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<tr>
<td>“A lot of it does come down to how it’s being taught”</td>
<td>Quality of instruction, support, and advice</td>
<td></td>
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<tr>
<td>“To me that class doesn’t really flow”</td>
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<tr>
<td>“There is new no new learning … I switch off lot during the tutorial”</td>
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<tr>
<td>“I think all of the materials that are online are very interesting”</td>
<td>Quality of program content and</td>
<td></td>
<td></td>
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<tr>
<td>“[T]hey’re short and straight to the”</td>
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<tr>
<td>Examples of relevant text</td>
<td>Sub-themes</td>
<td>Main themes</td>
<td>Research question</td>
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<tr>
<td>“For me the reading they gave us, it was too confusing”</td>
<td>materials</td>
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<tr>
<td>“It wasn’t really clear what they wanted in the assignments”</td>
<td>Assessment methods</td>
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<tr>
<td>“We should be assessed on being able to talk about it and discuss it”</td>
<td>Technological aspects of delivery</td>
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<tr>
<td>“There should be another way to access it without … technology playing big part in it”</td>
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<tr>
<td>“The first time that I used it, I lost all of my work after an hour of putting all the information in”</td>
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<td>“If they give you big workload sometimes you choose which part can do”</td>
<td>Workload</td>
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<tr>
<td>“I have this unit plus three other units, plus everything else that happens in life”</td>
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<tr>
<td>“[I]t’s just too much reading for one week”</td>
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<tr>
<td>“I had to actually look and read and stuff. So throughout, that helped me, because I knew they weren’t going to give it to me”</td>
<td>Promoting independent learning</td>
<td></td>
<td>Ways the flipped learning model fosters self-regulated learning</td>
</tr>
<tr>
<td>“It’s … made me more resourceful … in how I can approach different information … how I can finish assignments and all that”</td>
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<tr>
<td>“I think this is more deep learning … if you don’t have a clear understanding you you’re not going to go far within the unit”</td>
<td>Engagement in learning</td>
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<tr>
<td>“If I didn’t understand I search it up … so yeah it’s help my understanding a lot”</td>
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<tr>
<td>“It works around my gigs and everything else that I have in my life and that’s a really good, great advantage.”</td>
<td>Flexibility in place and time of learning</td>
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<tr>
<td>“You can go back to lesson one and then go back to lesson five as many time as you need”</td>
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<td>“At the beginning I was really confused … especially when what I was learning wasn’t followed up in the class”</td>
<td>Follow-up on progress</td>
<td></td>
<td>Ways the flipped learning model hinders self-regulated learning</td>
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<tr>
<td>“As a learner I found this unit slipping to the back of my mind more than the other units I have that are weekly”</td>
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<tr>
<td>Sometimes I need the teachers to explain a lot of other things I don’t understand”</td>
<td>Support and guidance</td>
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<tr>
<td>“I had no validation, no feedback on whether I’m getting things right or not”</td>
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<tr>
<td>“The online learning with tutorials”</td>
<td>Engagement</td>
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</table>
In the results chapter, the findings are presented by these themes and sub-themes, organised by each research question. Verbatim quotes are used to illustrate each theme from a variety of perspectives, to ensure that the participants’ own experiences are conveyed as accurately as possible and to capture differences as well as similarities in their self-regulated learning within the flipped learning model. Quantitative data are also incorporated to provide a more comprehensive picture of the extent to which different types of attitudes and behaviours relating to flipped learning and self-regulated learning exist among this sample of learners.

3.6 Measures of Research Quality

Throughout the design and implementation of the study, steps were taken to ensure that the research met high methodological standards and that its results were robust. It is essential that qualitative research should achieve the same high standards expected of quantitative studies, though different measures are often used to assess the two types of research. The concepts of reliability and validity are most commonly used to assess whether a research study is sound: in broad terms, reliability refers to the extent to which a survey instrument or other data collection tool will consistently achieve the same results over time, with any variation reflecting a real change in the variable being measured (Yin, 2011). Internal validity refers to the extent to which the instrument is actually measuring what it is intended to measure, while external validity refers to the extent to which the findings of a
In quantitative research, both reliability and validity can be measured using statistical techniques. Another concept commonly used to assess the standard of quantitative research is *objectivity* (Yin, 2011).

In the case of qualitative research, these concepts cannot be applied and measured in the same way. Instead, Guba and Lincoln (1994) identified four corresponding concepts that are more appropriate for use when judging the way in which qualitative research has been conducted. Instead of internal validity, they proposed *credibility*, or whether the findings are believable from the perspective of the research participants; instead of external validity, they suggested *transferability*, or the extent to which the findings are relevant to other contexts; instead of reliability, they argued for the use of *dependability*, or the extent to which the research processes are sufficiently documented to enable other researchers to replicate the study in a different setting, or to judge the standard of methods used. Finally, Guba and Lincoln (1994) recommended that the concept of *confirmability* should be used instead of objectivity, for the purpose of assessing whether the findings indeed reflect the actual views and experiences of the participants and not the views of the researcher.

Some of the measures used in the present study to ensure high methodological standards that can be assessed against these concepts include: producing “thick description” of the topic of study, which can help ensure credibility and confirmability of the findings; writing a reflective commentary; using triangulation through the use of different methods, to ensure dependability; and fully documenting the data collection and analysis methods, to enable the transferability of the findings to be assessed (Yin, 2011).
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Credibility and confirmability of the findings were also ensured with respect to focus group and interview data by the use of audio recording, and by member-checking of transcribed participants’ responses. Further, the subsequent coding of the participants’ transcripts was validated by independent coding and cross-checking by two research assistants who compared, discussed, and reached consensus about their results. Note that formal statistical ‘inter-rater’ (or more accurately ‘inter-coder’) reliability tests between the coders were not conducted because it was unnecessary to do so. The salient methodological question was whether different coders had independently selected different categories for the verbal data. Whenever cross-checking revealed a discrepancy between the coders, rather than leave the matter there and then attempt to determine a statistical measure of the degree of homo/heterogeneity in judgements, there was instead systematic discussion as to why a discrepancy in judgement had occurred. A collective determination was then made by the three coders as to which coding judgement was deemed to be the most appropriate one. Less than 10% of the coded items where in disagreement, and there were no irreconcilable disagreements between the coders; consensus was achieved in every instance. By this method, there was, in the final analysis, complete consilience about the coding of the verbal data.

Dependability has been assured by the description of the method of recruitment and interviewing, as well as by the transcription of both the pre-set questions and the questions which emerged organically out of conversations with participants. This information enables other researchers to replicate the mode of data collection used in the present study.

As for transferability, the flipped learning model that was examined in the present study had itself been previously trialled and validated by experienced senior academics to ensure that it used a recognised approach to flipped learning, fully
informed students of its structure and its nature (the delivery mode, the activities, the academic requirements and the expected learning outcomes), and utilised teaching staff who had previous experience with the flipped learning model. Further, the present study drew upon a sample of participants from diverse demographic backgrounds so as not to skew the interview findings according to a particular narrow, demographic profile.

3.7 Ethical Considerations

This section provides a general overview of the ethical considerations taken into account when conducting this study. Maxwell (2009) has suggested that ethical concerns should not be a separate element of the research design; rather, consideration of ethics is an ongoing process that is involved in every aspect of qualitative (and quantitative) research design. Before data collection commenced, the Human Research Ethics Committee of Western Sydney University reviewed the study plan according the university’s ethical code of conduct, and on October 28, 2014, approval from the committee was obtained (see Appendix B).

According to Stake (2005), “Qualitative researchers are guests in the private spaces of the world. Their manners should be good and their code of ethics strict” (p. 244). Therefore, one was mindful of protecting the participants’ wellbeing and confidentiality. During the recruitment process, all students who were enrolled in the flipped learning unit were given a fair opportunity to participate. They received a straightforward invitation letter and consent forms explaining the nature of the project (see Appendices C and D). At the same time, I met each class of students in person to explain to them the process, activities, and the time allotted for the study. I then asked students who volunteered to participate to complete a consent form, recording their willingness to be part of the study. I also informed participants that
they had the right to withdraw from the study at any time. Students were assured that their academic assessments and personal wellbeing would not be affected by non-participation or by withdrawing from the study.

Confidentiality and participant privacy were major concerns in this study. Therefore, I assiduously sought to safeguard the participants’ identities, the unit they were enrolled in, and the research location (Denzin & Lincoln, 2011). After recruitment, I contacted the participants directly by email or phone to ensure that their identities remained confidential. Although participants were asked to select a pseudonym, most of the participants picked names that might reveal their identities (such as “Cath” for Catherine). Therefore, to further safeguard the interest of the participants, I assigned alternative pseudonyms throughout the study. Furthermore, I used proxy names for the university (“Sydney Sunshine University”), campus number, and unit code. Data generated from this study were securely stored and I was the only person who had access to the raw data.

In terms of accuracy and precision of the data, I avoided any act of deception, manipulation, or omission of the data generated from the participants (Denzin & Lincoln, 2011). For example, interviews and focus group interviews were digitally recorded and transcribed, and then reviewed for accuracy by reading the transcripts while listening to the recordings. I also conducted member-checking to ensure respondent validation of the transcript (Yin, 2011). On specific occasions when it seemed the identity of the participant might be revealed, I removed or modified the relevant text while ensuring that the original meaning of their response was retained. For instance, I used an abstract name (e.g., a tutor, a student, or a brother) to keep the information anonymous when a participant referred to another person.

The multiplicity of data collection methods used in this study required a considerable amount of time and effort on the part of the participants (see...
section 3.5). Participants had to devote the necessary time to attend three interviews and write three reflective journals during the semester. To acknowledge their efforts, time, and contribution, a $20 gift card was given to each participant. I believe that the gift cards given to participants were innocuous and adhered to the ethical code of conduct (R. W. Grant & Sugarman, 2004).

There were a few ethical concerns that I took into consideration when planning for focus groups. One ethical issue was the risk of over-disclosure of personal information (Smith, 1995). I acknowledged to the participants that I did not have total control over confidentiality, because it remained a conceivable possibility that a participant in the focus groups could talk about focus group discussions with non-participants (such as family members or friends). As such, during the introductory statement, I strongly urged all members to respect the confidentiality of the participants in the focus groups (Smith, 1995).

With respect to the in-depth individual interviews, there were power-relationship considerations to be taken into consideration (Hewitt, 2007). The participants were students enrolled in a flipped learning unit and, to them, I was a researcher who had access to them through the Unit Coordinator. I attempted to minimise the participants’ feelings of vulnerability by building rapport and trust with them over the course of the data collection period. I did this by developing a sense of commonality and shared experiences with the participants. I emphasised that, like them, I had been a student, by sharing some of my own learning struggles and missteps as an undergraduate. In this way, participants were able to feel more comfortable about expressing their authentic thoughts and feelings, rather than presenting a façade of being “perfect” students. I also sought to build rapport by showing genuine interest in hearing their stories during the interviews, and by exploring with them interesting points they wrote in the learning log (journals). I
also gave interviewees as much time as they needed to fully elaborate on or explain points of interest to them, in order to avoid the impression that I was merely collecting data.

3.8 Chapter Summary

This chapter has discussed the overall methodological approach of the study, which is a qualitative instrumental case study using multiple methods of data collection. It is based on a constructionist epistemology, using an interpretivist (i.e. symbolic interactionist) theoretical perspective. Pintrich’s (2004) theory of self-regulated learning was used as a theoretical framework for data collection and analysis, and the case study setting for the study was a pre-service teaching unit administered by the School of Education at SSU in Sydney, Australia, which had implemented the flipped learning approach. Criterion sampling, a form of purposive sampling, was used to identify research participants with lived experiences of the flipped learning approach as a mode of instruction. Following a pilot study, three types of qualitative data collection methods were used in the main study: online semi-structured learning reflections, focus groups, and in-depth individual interviews. To complement the qualitative data collection tools, trace data were used as a quantitative method to examine the participants’ online engagement during the semester. Thematic analysis and selective coding methods, facilitated by use of the NVivo qualitative analysis software, were used to analyse the data. The chapter has set out the final coding trees used to answer each of the research questions, with examples of material coded to each theme. The following chapter expands on this to provide a full presentation of the research findings by the key themes and sub-themes relating to each research question. It also incorporates findings from the quantitative trace data to provide a more comprehensive picture of the extent to
which different types of attitudes and behaviours relating to flipped learning and self-regulated learning exist among this sample of learners.
Chapter 4: Findings I: Forms of Self-Regulated Learning

4 FINDINGS I: FORMS OF SELF-REGULATED LEARNING

4.1 Introduction

This chapter and the next present the findings of qualitative research conducted for the case study that is the subject of this thesis. The central research question of the study was: **What is the role of the flipped learning model in self-regulated learning?** This was broken down into three sub-research questions for the purpose of data collection and analysis. The findings relating to the first sub-research question are reported in this chapter. Sub-research question 1 was: **What forms of self-regulated learning are demonstrated by students in the flipped learning model?** The chapter following this one will deal with sub-research questions 2 and 3.

The numbers of participants giving different types of responses, as well as the overall distribution of responses, are provided throughout this chapter to demonstrate the similarities and differences between participants’ views and experiences relating to each aspect of self-regulated learning. It should be noted, however, that these counts are approximate and do not necessarily add up to a total
of 20 (respondents) within each theme. This is because the study used semi-structured qualitative data collection methods based on a conversational interview and focus group discussion style. The reported distributions (for example, numbers of positive or negative responses) cannot be assumed to reflect the responses of all participants since some may not have provided information on that particular issue. It is also important to note that the participants were not all asked exactly the same questions in the same way, since the researcher had the flexibility to adapt the specific content of the interviews and focus groups in order to capture most effectively the participants’ views and experiences as they emerged. Similarly, although the initial interview with participants was intended to focus primarily on their work planning, and the second interview on their reflections on the flipped learning unit, in practice the discussions were wide-ranging and quotes from both interviews are included throughout the two results chapters (Chapters 4 and 5). Similar and contrasting views are reported within themes in the analysis chapters (Chapters 6 and 7) to highlight the types of views held and how widespread these are, but the data on which this is based will often be drawn from different stages of data collection in which the issue was explored in different ways.

It must be stressed that analysis of behavioural data in the form of participants’ use of the online learning system can only provide a very tentative indication of self-regulated learning as set out in Pintrich’s model (2004). This is because self-regulated learning is essentially a cognitive process which can only be fully investigated based on the research participants’ own accounts of their views, perspectives, and behaviours relating to the flipped learning unit. Nonetheless, it might be expected that differences in levels of self-regulated learning among the participants might be also be manifested in different patterns of use of the online learning system. In this way, tentative inferences about certain aspects of self-
regulated learning can be made from analysis of this data, which can be triangulated
with the qualitative research material to provide a more comprehensive picture of
the participants’ self-regulated learning behaviours in this unit. See Appendix K for
a tabular summary of key findings from each subsection of this chapter. (Note that
this summary is necessarily selective: it does not incorporate all aspects of the
findings detailed below.)

4.2 Evidence of Self-Regulated Learning in the Flipped Learning Environment

In this section, the results are presented under headings corresponding with the
components of Pintrich’s (1991; 2004) self-regulated learning model, which formed
the main coding and analysis framework for the study, and is discussed more fully
in Chapter 2. In brief, the model consists of two main elements — a motivational
strategies scale and a learning strategies scale — each of which is broken down into a
number of separate components, as discussed in Chapters 2 and 3. These
components and their descriptions were used to identify forms of self-regulated
learning among the sample of students in the flipped learning unit from all the data
collected using interviews, focus groups, and learning logs, as well as the trace data
where appropriate. The results are presented below under headings corresponding to
each component of the model. Some of the related components (for example,
intrinsic and extrinsic goal orientation) are discussed under a single heading,
reflecting the ways in which the research results relating to each component could
not be easily disentangled. By way of summary of the data, Table 4:1 below shows
the results of the coding, with respect to the SRL Model’s components, sub-
components, the type of responses by participants, and frequency of responses by
the participants.
Table 4:1 Participant Responses to Pintrich SRL Model Areas

<table>
<thead>
<tr>
<th>Pintrich SRL Model Areas</th>
<th>Pintrich SRL Model Components</th>
<th>Pintrich SRL Model Sub-components</th>
<th>Type of Participant Response</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivational strategies</td>
<td>Goal orientation</td>
<td>Extrinsic goals</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intrinsic goals</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Task value</td>
<td>Practical</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Utility</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skills or knowledge</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Questioning value</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Modifying effort based on perceived value</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comparative cost</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Expectancy</td>
<td>Control beliefs</td>
<td>High perceived control</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low perceived control</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mixed beliefs on control</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Self-efficacy</td>
<td>High self-efficacy</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low self-efficacy</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Affective</td>
<td>Assessment anxiety</td>
<td>Negative impacts</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Positive impacts</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Learning strategies</td>
<td>Rehearsal</td>
<td>Reinforcing learning</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Elaboration</td>
<td>Prior TAFE knowledge activation</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Building on previous work or multiple sources</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Organization</td>
<td>Basic methods</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advanced methods</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Critical thinking</td>
<td></td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>
### Chapter 4: Findings I: Forms of Self-Regulated Learning

<table>
<thead>
<tr>
<th>Metacognitive self-regulation</th>
<th>Planning</th>
<th>All planning</th>
<th>12</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Systematic, advanced methods</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Planning for consistent progress</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Use of monitoring tools</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Regulation</td>
<td>Self-review of work or use of quiz</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Resource management strategies</td>
<td>Time and study environment</td>
<td>Time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting aside blocks of time for study</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Environment</td>
<td>All</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Need quiet</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Need activity</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Use library</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Effort regulation</td>
<td>All</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Avoiding distractions</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Increased focus</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Taking breaks</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Peer learning</td>
<td>Prefer collaborative learning</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Help seeking</td>
<td>From teachers</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>From peers</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>From others</td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>
4.2.1 Motivational strategies

4.2.1.1 Goal orientation: Intrinsic and extrinsic

The first two value components of self-regulated learning under the motivational strategies elements of Pintrich's (1991; 2004) framework relate to the goal orientation of learners. Pintrich (2004) pointed out that self-regulated learning requires the setting of goals, which can be used by the learner to assess his or her own performance and make changes, if necessary, to ensure that the goals can be met. According to these two dimensions, goals can be either extrinsic to the learning process itself, such as passing a subject or achieving particular grades, or intrinsic in nature, such as enjoying the learning process or increasing one's knowledge as an end in itself. Pintrich’s (2000) framework also includes another component relating to goal orientation: task value. This refers to the student’s evaluation of how interesting, important, or useful the task is. High perceived task value could be expected to lead to more involvement in one’s learning.

In terms of the intrinsic/extrinsic goal orientation distinction of Pintrich’s model, most of the learners in this study made statements in their interviews and focus groups that indicated that they held a combination of extrinsic and intrinsic goals. Overall, 16 students mentioned extrinsic goals, but of these, only three (Anh, Elena, and Fang) also mentioned some kind of intrinsic goal. The extrinsic goals cited by the participants took a variety of forms such as passing the unit or achieving a specific grade, or completing the unit because of its importance in relation to their intended future career. Although it was not possible to accurately compare the responses of participants by demographic characteristics, given the qualitative methods of the study, it is worthy of note that the participants who only held a high school education before entering the program mainly cited extrinsic goals (N=4).
rather than intrinsic goals (N=1). In contrast, the responses of those with higher levels of education were split more evenly between intrinsic and extrinsic goals.

“I always just try to do my best. As long as I pass I don’t really mind. That’s my main thing. I just don’t want to fail the unit.” (Elena, Interview 1)

“I just want to pass and complete everything and get my Bachelor of Arts and just start teaching.” (Anh, Interview 1)

There was evidence that some students sought to achieve a high level of performance in their work and did not just aim to pass the subject:

“I want to get good marks. I want to do good. I don’t want to get just a pass. I want to do better.” (Anh, Interview 2)

“I always want eighty or above ... Because I think that if you’re going to continue you should do the best that you can ... I think that if I get a bad mark I’m going to feel terrible and I’m going to be like well, I didn’t try hard enough on that.” (Ruby, Interview 1)

Thirteen of the participants cited intrinsic goals that were important reasons for their participation in the unit, but all of these also mentioned extrinsic goals, indicating that they were motivated in their studies by a combination of factors including a personal interest in learning and in the course material, as well as the expected rewards of completing the unit and their degree. For example, when asked in her first interview how she kept herself motivated, Grace responded, “with a deadline. That was pretty motivating”, but in the focus group discussion she said, “It is not just about the assessment ... It’s about furthering your knowledge” (Grace, Focus Group 6).

Similarly, Olivia, who explained that she had registered for the degree in order to learn the new skills necessary for a change of career, said:
“Learning. I want to learn. I always want to learn, so I’m always learning. All the time, whether I’ve been in university or not, but now in my stage of learning, it’s required me to go to university, again, to do this bit of learning ... I learn to understand further, not just to pass exams or units.”

(Olivia, Interview 2; Learning Log 3)

Although four of the participants did not clearly express their goals in the interviews or focus groups, on the whole these findings show that while the students’ personal goals differ from one another, they were generally able to communicate them, indicating evidence of self-regulated learning under this component of the first dimension of motivational strategy. That is, participants were able to discern what was important to them in relation to taking the flipped learning unit, which is identified in some studies as an important element of self-regulated learning (Elliot et al., 2015; Pintrich, 2004).

4.2.1.2 Task value

The third value component of the motivational strategies elements of the model is focused on the learner’s perception of why they are undertaking a particular task or activity, and how interesting or important it is to them. As discussed by Pintrich (2004), evidence of self-regulated learning may be drawn from how learners are able to evaluate the worth of a given task to them, either in relation to the program that they are enrolled in or, on a more general level, their broader personal and professional goals. Higher task value is assumed to result in more involvement in learning.

Specifically, 12 of the participants identified various forms of practical value in the purpose of the program.
“When you actually go out like... I mean ... this course will get you into centres and stuff.” (Daisy, Focus Group 1) (referring to the perceived positive impact on job opportunities)

“I'm doing this... because this unit will ... get me some overall theory about the play ... because play is very important factor in early childhood teaching area.” (Chun, Focus Group 5)

Expressing a different form of extrinsic goal, two of the 12 participants also mentioned the utility value of the unit in terms of the expected return on investment from their fees, a factor which they indicated was important in motivating them to achieve their goals.

“I am international student. I pay a lot of money. So that’s kind of my motivation. So, if I fail I would have to pay more. It kind of push me.” (Bulana, Interview 1)

“I'm paying all this money I rather like do well instead of just passing like when you can do better than a pass sort of thing.” (Stephanie, Interview 1)

Six participants discussed the value of the unit or individual assignments in terms of the types of skills or knowledge they were gaining from them, or the ways in which they built on one another to contribute to their overall learning from the unit. As Chun explained, for example:

“The purpose of this assignment is give you some basic framework ... Without these you cannot do the proper learning planning related to the syllabus or related to the pedagogical curriculum. It’s very important.” (Chun, Interview 1)

However, 12 of the respondents also questioned the value of at least some of the assessment tasks assigned to them in the unit, indicating that they had little practical relevance to their future careers. Many of the participants with lower levels of prior
education (diploma or below) fell into this category. In many cases, these were the same students that were also able to identify some practical value in the unit and its assignments.

“I thought it’s going to be something like … what are the benefits of play … or create some play experience for children … or something like hands-on … Play is useful for this … but write an essay on technology … like, why?” (Grace, Focus Group 6)

“Writing an essay isn’t important for me … I don’t see how that’s going to help me in life.” (Daisy, Interview 2)

Whether or not the students were identifying value or being critical of the unit and the tasks assigned to them, from a self-regulated learning perspective either type of response does indicate that they were able to actively evaluate the value of tasks in relation to their own goals. There was also evidence that, having assessed the value of learning tasks, some students then modified their effort or approach to learning based on this. For example, if tasks were not being assessed, they put in less effort, particularly when facing heavy workloads and needing to prioritise their available time. Although only a small number of students (N=4) specifically gave this type of response, it provides some evidence among these learners of self-regulated learning based on assessing the value of a task and allocating their time and effort to it accordingly. Grace, for example—who was one of the students who identified both extrinsic and intrinsic goals for her learning in the unit—indicated that she perceived that the unit videos were the same as those she had already seen while undertaking her TAFE course and that she therefore gained no value from watching these again.

A deliberate weighing up of the value of engaging in different tasks within the unit, and in these and other personal or professional activities was also evident in
some of the participants’ responses, and provided further evidence of the ways in which they evaluate task value and prioritise their time accordingly. For example, Ruby articulated the perceived importance of an assignment in terms of its relative contribution to her overall grade for the unit, and the amount of work involved:

“I kept thinking I don’t want to fail this because then my other one (assignment) that’s worth fifty per cent is going to take a lot more work and it’s going to be a lot harder.” (Ruby, Interview 1)

Comparing the value of time put into her studies with paid employment, Anh explained why she sometimes chooses to work instead of study, having weighed up the immediate need to earn money against the longer-term rewards of education.

“I value work more because education, I can always go back and learn it, I’d say. Yeah, and I still have, like, a long life, so if I were to stop, then I could do it again later, but work, it’s an ongoing thing. I need to pay bills and stuff at home as well, so yeah.” (Anh, Interview 2)

When assessing the value of attending classes in the flipped learning unit, Ruby also emphasised the opportunity costs of lost earnings from taking time off work.

“There was nothing that she didn’t teach me in those two that I didn’t do in my assessment … to begin with I took one day off a week off work. So I lost money doing it and it was for what? Nothing. It was for nothing.” (Ruby, Interview 2)

Overall, these qualitative findings provide strong evidence that many of the research participants were actively evaluating task value in the ways set out in Pintrich’s model. In the case of these flipped learning unit participants, the outcome of this evaluation was often a decision that the unit or its tasks represented low value in relation to their intrinsic or extrinsic goals. The evidence for the task value and goal orientation aspects of self-regulated learning among the participants is explored
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further in the following section based on the quantitative trace data from the online learning system.

4.2.1.3 Goal orientation and task value: Quantitative findings

As noted in above, only very tentative inferences can be drawn about self-regulated learning from analysis of student behaviours in the form of patterns of usage of an online learning system. However, the use of trace data is becoming an established and useful methodology for the analysis of self-regulated learning in conjunction with other forms of data (e.g., Hadwin, Nesbit, Jamieson-Noel, Code, & Winne, 2007; Kinnebrew & Biswas, 2011; Roll & Winne, 2015), as discussed in Chapter 3.

In the current study, the trace data were initially used to examine the research participants’ patterns of activity in using the online learning systems. Although an initial measure, it might be reasonable to expect that a dominance of extrinsic goal orientation among the participants would be reflected in peaks of activity in the trace data just before assignment deadlines or before tutorials, when there is a need for learning activity to achieve goals based on the assessment requirements. In contrast, if intrinsic goals were dominant among participants, it might be expected that there would be more consistent levels of activity throughout the semester. The qualitative data indicated that most participants hold a combination of intrinsic and extrinsic goals. Examination of the trace data offered an initial test of whether their behaviours in practice supported this finding from the interviews. Two types of trace data were available to examine students’ online behaviour: (a) dates of first-time access of the Assignment 1 content folder; and (b) total number of times the Assignment content folders and the worksheet folders were accessed over the semester. Figure 4-1 shows the numbers of students who first accessed the Assignment 1 content folder during three periods: less than 1 week before the
assignment was due, 1 to 3 weeks before this deadline, and more than 3 weeks before the deadline. Figure 4-2 shows the aggregated data on the number of times participants accessed the assignment content folders and the weekly worksheet folders during the semester.

With respect to the trace data of the dates of first-time access of the Assignment 1 content folder (Figure 4-1), for students who accessed learning materials at an early stage before the assignment deadline, this kind of behaviour is most consistent with time management mastery. It cannot be established, however, whether such students are intrinsically or extrinsically motivated. One might reasonably expect that an intrinsically motivated student would access the Assignment 1 material at an early stage because of an interest in the content in itself. It is also consistent, however, with behaviour of an extrinsically motivated student who has a command over time management strategies (which would thus entail early accessing of the Assignment 1 material in order to be well prepared to research and write assessed responses before the submission deadline). By contrast, for students who accessed the Assignment 1 folder relatively late (less than 1 week before the assignment was due), it is plausible to infer that these students are neither intrinsically motivated nor good time-managers (who are extrinsically motivated). In other words, it is plausible to suggest that such students are extrinsically motivated but poor time-managers. The data show that half of all the students (N=10) accessed the Assignment 1 content folder at least 3 weeks before the assignment deadline. Thirty per cent of the students (N=6) accessed the folder less than 1 week before the assignment deadline. These results are therefore consistent with the qualitative finding that students held both intrinsic and extrinsic goals. The data relating to the first date of accessing the learning materials did not prove to be useful in providing any further insights in this area, since all the students first
accessed the learning materials within a short period at the beginning of the semester.

![Figure 4-1 First access of Assignment 1 content folder](image)

**Figure 4-1 First access of Assignment 1 content folder**

Another way of exploring the goal orientation of students using the trace data is to examine the frequency with which different types of folders were accessed in the online system (Figure 4-3). Although only providing a rough indication of goal orientation, it is possible that a focus on extrinsic goals such as grades might be reflected in higher levels of access to assignment folders compared with weekly worksheets that are not graded. This is also a potential way of investigating the self-regulated learning component of task value, in that students might not access types of online content that they perceive to be of low value in terms of achieving (extrinsic) goals. Figure 4-2 shows the aggregated data on the number of times participants accessed the assignment content folders and the weekly worksheet folders during the semester; it was evident that assignment folders (535 times) were accessed much more frequently than weekly worksheets (162 times). This suggests a possible dominant focus on extrinsic goals among the sample of participants as a whole, and also supports the qualitative finding that participants were actively evaluating task value and prioritising the time spent on different tasks according to their perceived value in relation to their goals.
4.2.1.4 Expectancy: Control of learning beliefs

The expectancy component of Pintrich’s (1991; 2004) model consists of three separate dimensions: control of learning beliefs, expectancy for success, and self-efficacy. The second and third of these dimensions are closely interrelated and the findings relating to these are discussed in the following subsection. This subsection presents the findings relating to control of learning beliefs. According to Pintrich’s (1991; 2004) model, evidence of the expectancy component of self-regulated learning, as a category of motivational strategies, is provided by a learner’s belief that they have control over their own learning and its outcomes. Self-regulated learners are able to recognise that the outcomes of their work are contingent on their own efforts and abilities, rather than factors that are beyond their control.

Six of the participants expressed views that were aligned with this approach, indicating that they felt it was down to individual learners to put in the effort if they wanted to obtain positive outcomes from the flipped learning course, and not rely on input from the instructors. For example, Elena stressed, “Well, it’s up to you, if you want to pass the unit you need to do the work”, and Chun argued, “students have to be self-directed … rather than waiting for the tutors”. Similarly, Grana emphasised
that within a flipped learning unit it is down to the students to study independently, in order to achieve their goals:

“You have a responsibility to do the online stuff. You, you have to do your independent learning, like, for you to better yourself and to better your education.” (Grana, Interview 2)

However, there were also examples of contrasting beliefs that outcomes such as grades are dependent on factors outside the students’ own control. It was found that at least five students considered that the outcomes they received were almost entirely dependent on the teacher. Their responses reflected a sense of disillusionment with the flipped learning unit, although this seems to have had more to do with the nature of the assessment than with the structure of the unit itself. The following quotes are typical, and convey the respective students’ views that teachers were marking their work subjectively, and that it was therefore difficult to predict their requirements:

“Everything is based on your teacher; it’s not about your ability. So every teacher wants something different off you. So you just have to find out what your teacher wants and then write based on what they want.” (Ruby, Interview 1)

“I like to explain or elaborate more. Apparently, that’s not really valued here … it’s like, I’m playing the game. You know I have to read in between the lines, ‘OK she expects me to do that’. So I do it. And I work around it my way.” (Gabriela, Interview 1)

While these findings show that at least some of the participants felt that they did not have control over their learning outcomes, they also indicate that participants were aware of the types of factors in the learning environment that must be managed in order for them to secure as much control as possible over these outcomes.
Overall, the findings indicate that these participants had a high level of awareness of the level of control they have over their learning, and are again aligned with the self-regulated learning model.

4.2.1.5 Expectancy: Expectancy for success and self-efficacy

The expectancy component of the self-regulated learning model includes the performance expectations of learners, as well as their self-efficacy or self-appraisal of their ability to accomplish a task. The responses of the learners in this study indicated that they were generally able to develop expectations about the outcomes of their work, and demonstrated consciousness of their levels of self-efficacy.

For around half of all the students (N=11), these levels of self-efficacy were high, and the learners felt that they were able to do well in the performance tasks assigned to them. Fang observed in general terms, for example, “I’m pretty good at managing my schoolwork”, and Nanami stated, “I think for me it is a bit easy to do all the questions”. Some of the comments reflecting high levels of self-efficacy were made when asked about expected grades from assignments, such as the following response from Anh:

“I think I’ll get a credit hopefully. A distinction—that would be better. I’ll try, I’m trying and I’m halfway through my assignment. I think it’ll be good.” (Interview 2)

The remaining nine participants, however, expressed lower levels of self-efficacy, which was often explained in terms of factors such as language difficulties or lower academic abilities, as reflected in the following example from Daisy:

“I’m not one of these people that needs to get a high mark ... I’m not highly academic ... I always struggled with reading, and writing and stuff like that, so for me, a pass mark is a good mark for me.” (Daisy, Interview 1)
Some of the responses suggested that the participants set lower expectations for themselves as a coping strategy, reflecting a lack of confidence in their abilities to achieve high grades. Setting low standards such as a pass or credit, for example, reduced the pressure on them, as explained by Chun:

“Credit is fine. Of course, everybody want to get the good mark but for me I think I make the low expectation so I won’t pressure myself too much. Then I try my best to do. Then after I get a mark maybe I can surprise myself.”

(Interview 1)

Bulana similarly explained that she would be happy with a pass mark since her lack of proficiency in English meant that a higher grade was, in her view, “unrealistic”.

Although the performance expectations of many of the participants appeared to closely reflect their perceived self-efficacy, it was found that performance expectations related not just to self-efficacy but also to the perceived effort that the students had put into the task. This also relates to the first dimension of expectancy—control of learning beliefs—as discussed in the previous subsection. As Gabriela reported in her first learning log, this reflects the view that if the students work hard, they expect to achieve a high level of performance:

“I expect to do well considering I will be spending a great deal of time researching what will help me excel in this unit.” (Gabriela, Learning Log 1)

The data revealed evidence that the performance expectations or the self-efficacy levels of some of the learners changed over time as their task progressed and they either encountered difficulties or found it easier than expected, or when they received grades or feedback that affected their expectations of future performance. The following quote from Fang’s first interview, for example,
suggests an increase in self-efficacy over time as she became more familiar with the online learning methods used in this unit.

“First year ... I just didn’t like online learning ... this year I think I am alright with the online learning ... leading by myself ... Last year ... I think the content was way too hard ... but this year it seems a bit easier... like the things that are online that you have to read ... everything seems more simple” (Fang, Focus Group 2)

In contrast, other students seemed to have experienced a decline in their self-efficacy or in their performance expectations over time, as they struggled with a heavy workload or received lower grades than expected for their assignments, as the following two quotes demonstrate:

“Well, in the beginning I thought I could handle it but as time went on it got a bit harder with everything else coming in. I didn’t do as much of the online work as I’d like do.” (Anh, Interview 1)

“I just got a pass again, so I’m just ... I know I’ll be a pass student. Whatever.” (Gabriela, Interview 2)

Again, despite the variation in responses, the data indicates that many of the participants were conscious of their own levels of self-efficacy and linked this with their expectations of performance in the course or on individual assignments. This provides further evidence of self-regulated learning among this sample of students, the implications of which will be discussed in Chapter 6 along with those of the other findings reported in the current chapter.

4.2.1.6 Assessment anxiety

The final component of the motivational strategies elements of self-regulated learning, according to Pintrich (1991; 2004), is an affective component. This is concerned with what the students feel about their studies and assignments, and how
these feelings contribute to their ability to manage their learning processes. Pintrich (2004) argued that anxiety about assessment could disrupt self-regulated learning. He distinguished between a worry component, referring to negative thoughts that have an impact on performance, and an emotionality component, which refers to the affective and physiological aspects of anxiety.

Evidence of anxiety was found in the responses of around half (N=9) of all the participants, although the distinction between worry and affective aspects of anxiety were not always clear-cut. Almost all of the participants reporting assessment anxiety were educated to diploma level or below before entering the program, suggesting that perhaps these students were less experienced than those with higher qualifications at managing assessment anxiety. It emerged that there are three main situations when anxiety tends to arise: in response to workload pressures, when up against an assessment submission deadline, and after submitting their work and waiting anxiously for the outcomes.

At many points in the discussion groups and interviews the participants highlighted the pressure they feel from heavy workloads, not just within the flipped learning unit but combined with the work of other units, as reflected in the following quotes, which convey a sense of stress and panic among some participants:

“I have been very stressed out because all the units this time are coming in
... they are all due the same week ... with placement added in just now,
yeah, I think it’s overwhelming.” (Anh, Interview 1)

“I was freaking out ‘cause I think had three assessments due all at the one
time and I was like oh my god I’m not going to have enough time to do all
this.” (Daisy, Interview 2)

The concept of stress was often referred to in the context of being up against assignment deadlines:
“I was a bit stressed wondering if I’m going to complete it on time and if it’s going to give me the marks I want.” (Kya, Interview 1)

In contrast, the cognitive concept of worry, as well as the more affective concepts of fear and anxiety, was invoked by participants who were concerned about their results after submitting work.

“I was worried about the mark especially because it was people in the class that were … that got their marks beforehand and they failed, so it was kind of worrying.” (Grana, Interview 1)

The negative effects of anxiety, consistent with Pintrich (2004), were acknowledged by some of the participants, and some drew on familiarity with these uncomfortable feelings from the past in order to help them avoid such situations again.

“I just hate that feeling because sometimes I am up the night before … just editing … but not writing it … But, I don’t ever want to have that feeling. Because I had that feeling all in TAFE from doing it the night before … I don’t want to have that anxiety” (Ruby, Interview 1)

However, in contrast with Pintrich’s model, there was some evidence that, at least for a minority of the participants, the discomfort of stress and anxiety has a positive rather than a negative impact on learning, a point that is examined further in Chapter 6. Four explained, for example, that uncomfortable feelings of pressure and even panic are necessary for them to be sufficiently motivated to complete their work, as demonstrated in the following quotes:

“[I] get really anxious, be like, oh, my God, can I do this and then in the end I would produce something really well and I think that’s just ‘cause I work well under pressure but … yeah … it’s very weird, yes … a very weird way of learning” (Daisy, Interview 2)
“I start to panic when I know the due date is coming so I have to motivate myself by saying, ‘oh, you can do it’, ‘you can finish it’ and then I eventually finish it. Yeah. Well, I usually tell people that my panic is what drives me to finish an assignment.” (Xia, Interview 1)

Overall, the participants in this study were found to engage in various forms of self-regulated learning, in accordance with Pintrich’s model, through various motivational strategies. Specifically, the participants were found to be capable of defining their goals, assessing the value of different tasks in relation to those goals, identifying their expectations from the task and their own performance in the task, reflecting upon different emotions that they felt in relation to accomplishing tasks assigned to them, and using these to regulate their learning and task achievement. The following section presents the findings in relation to the learning strategies element of Pintrich’s (1991; 2004) model.

4.2.2 Learning strategies

The second element of self-regulated learning under the framework of Pintrich (2004) deals with the learning strategies of the learners. Pintrich (1991; 2004) identified a number of different learning strategies that self-regulated learners employ, which fall within this category, specifically rehearsal, elaboration, organisation, and critical thinking. Evidence relating to each of these components is described and discussed in this section.

4.2.2.1 Rehearsal

As discussed by Pintrich (2004), rehearsal is the learning strategy that deals mainly with recall of important aspects of a lesson or a task. This component of the self-regulated learning model involves memorising basic information. It is assumed to influence attention and encoding aspects of learning, and is a lower level learning
strategy. While there was scant evidence of the use of memorisation as a strategy by the learners in this study, this was not unexpected given the nature of the flipped learning unit. The unit was not designed for students to focus on memorisation as their primary learning strategy, but rather on higher-order thinking strategies that can help them navigate independently in the learning environment.

The most relevant findings relating to rehearsal related to the online quizzes designed to test the learners’ retention and understanding of material. Three of the participants referred to these quizzes as a useful way to help reinforce their learning. For example, Fang explained:

“There is a short quiz that test your knowledge... very simple questions... and the quizzes are testing... like what they have learned last week.” (Fang, Focus Group 2)

4.2.2.2 Elaboration

The elaboration component of Pintrich’s self-regulated learning framework covers the strategies that learners use to help build internal connections between aspects of learning, including linking new information with existing knowledge. Pintrich (1991; 2004) notes that examples of elaboration activities include paraphrasing, summarising, creating analogies, and note-taking. Other researchers have identified related concepts, such as prior knowledge activation (Greene & Azevedo, 2009).

There was considerable evidence of prior knowledge activation among the sample of learners in this study. Five participants reported that they tapped into the knowledge gained from their former TAFE diploma course and even used the textbooks from that course to complete their flipped learning unit assignments. Some used this existing knowledge as the main criteria for the selection of an assignment.
“When I read the question I thought maybe I can use that text at home.”
(Nanami, Interview 1) (referring to knowledge of a book she already possesses)

The use of existing resources did appear to be a conscious self-regulated learning strategy for the participants who reported doing so, explained in terms of saving research time and giving them a basic level of understanding of the topic on which to build.

“I thought it would save me time on researching ... and in the end it did because I could use many of the same papers.” (Gabriela, Interview 1)

“My knowledge from TAFE it was very useful because I already have a bit of idea what I want to talk about and how I want to discuss.” (Nanami, Interview 1)

However, the use of resources and learning from a less academically advanced (TAFE) course may indicate that these strategies are hindering rather than promoting the students’ learning in the flipped learning unit. It seems that, when required to study independently, at least some of the students may rely too heavily on the knowledge and resources already available to them, instead of seeking out new information to build their knowledge and understanding of topics. Support for this point may be provided by Nanami’s response when asked why she used her TAFE textbook for an assignment: “It explains really clearly, easy to understand”, and Xia’s comment:

“Doing the assignment I already knew how to do, because I’ve already done the same assignment in TAFE, so I didn’t have to prepare much for it.” (Xia, Interview 1)

The finding that nearly all of the participants reporting the use of vocational education and training material were aged between 19 and 21 also supports this.
These relatively young participants would have completed a TAFE course quite recently, and the material would be fresh in their minds and convenient to draw on, even if not the most suitable material for the current program.

Just under half of all the participants (N=8) did explain how they utilise different types of resources, extract relevant material from these, and integrate it into their assignments, indicating a more effective approach to self-regulated learning. For example, Anh described the ways in which she uses elaboration strategies by extracting material from articles, paraphrasing, and structuring her essay:

“I look for a lot (of articles). Then I read through a couple. Then I’ll put it into the paragraph and see how I can link it back to the question and stuff ...
I do a topic sentence and then I would put in my source, so I would mostly paraphrase ... I will link it back to the question and then I end with an ending sentence.” (Anh, Interview 1)

Others reported using other types of resources such as YouTube or Google, seeking the input of professional colleagues, and even observational methods when working on their assignments. An important point in relation to self-regulated learning is that the types of resources used appear in some cases to be tailored to the individual learning styles of the participants. For example, in her second interview, Ayu explained that she prefers face-to-face instruction when learning, and in one of the focus group discussions she explained that she uses YouTube videos as a learning resource, a strategy which appears to be effective as a substitute for attending lectures in person within this flipped learning unit:

“Sometimes if I don’t understand something I go to YouTube ... someone actually explaining it to me not just by words ... but actually speaking it in their own words, that would help me.” (Ayu, Focus Group 1)
For other participants, elaboration strategies involve building on prior knowledge gained during earlier stages of the flipped learning unit, or drawing on learning from other units in their degree.

“[I] added the knowledge that I’ve learned throughout the course in my essay, because there were certain content that we were learning in classes that were useful for the essay at the end.” (Kya, Interview 1)

“I tried to reuse articles that the unit have already encouraged us to read about technology.” (Xia, Learning Log 2)

In a learning log entry, Fang explained the use of prior knowledge and multiple resources when working on an assignment as follows:

“I start writing the essay to answer the question of the topic as best as I can and put in the relevant information that I’ve found in the articles, essential texts from my other xx unit and also from the essential text of this unit.”

(Fang, Learning log 1)

Elaboration generally involves pulling together different resources and knowledge in the learning process and making links between these: at a basic level, it might be reasonable to assume that some evidence of this might be available from the trace data. For example, elaboration strategies might be reflected in the use of multiple online resources, or the use of particular types of resources such as the online library. Within the flipped learning environment, in which students necessarily access most of their learning resources via the online system, it can be expected that those making little use of elaboration would be expected to access fewer types of online content, while those adopting elaboration strategies would typically access a wide range of content and links.

Figure 4-3 shows the trace data of overall distribution of online activity (total numbers of “hits” or access clicks, N=8737) by area of the online learning course.
This shows that the vast majority of activity (83%) on the part of all students was for the purpose of accessing “content items” such as assignment-related material, worksheets, and learning materials. There was thus very little online collaboration or engagement with the discussion board tools.

Figure 4-3 Overall distribution of instances of access to online unit in whole semester, by type of content accessed (N=8737)

What then were the content items accessed by the students? Table 4:2 shows the content activity by content items accessed. This trace data reveals that the majority of content-related activity (56% of all instances of access) involved accessing assignment folders and learning materials. Other commonly accessed content included the home page (18%) and content relating to field visits (14%). Only 7% of activity involved accessing unit information and only 2% of activity involved accessing library readings and resources. Further, accessing the library via the online learning unit, Turnitin help materials (online plagiarism checker and
academic writing guidance), and the welcome/introduction material, each accounted for less than 1% of overall activity. Overall, the trace data suggest that students exhibit low levels of elaboration as a learning strategy in terms of the use of diverse resources and information within the online learning unit. It should be noted, however, that this only provides a partial picture of the use of elaboration strategies by the sample, as the qualitative findings have shown that at least some of the participants also used sources accessed via links external to the online learning system, such as YouTube and Google.

Table 4-2 Instances of access to different online content items (N=7219)

<table>
<thead>
<tr>
<th>Type of content</th>
<th>Hits</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning materials</td>
<td>2072</td>
<td>28.70</td>
</tr>
<tr>
<td>Assignments</td>
<td>2009</td>
<td>27.83</td>
</tr>
<tr>
<td>Home page</td>
<td>1326</td>
<td>18.37</td>
</tr>
<tr>
<td>Field visit info (practicum)</td>
<td>1043</td>
<td>14.45</td>
</tr>
<tr>
<td>Unit information</td>
<td>504</td>
<td>6.98</td>
</tr>
<tr>
<td>Library readings and resources</td>
<td>156</td>
<td>2.16</td>
</tr>
<tr>
<td>Welcome and how to get started</td>
<td>50</td>
<td>0.69</td>
</tr>
<tr>
<td>Details of teaching staff</td>
<td>32</td>
<td>0.44</td>
</tr>
<tr>
<td>Turnitin help materials</td>
<td>21</td>
<td>0.29</td>
</tr>
<tr>
<td>Library</td>
<td>6</td>
<td>0.08</td>
</tr>
<tr>
<td>TOTAL</td>
<td>7219</td>
<td>100.00</td>
</tr>
</tbody>
</table>

4.2.2.3 Organisation

This component of Pintrich’s model refers to learning strategies that help individuals to select appropriate information and construct connections among the information to be learned. The participants in the present study reported a variety of strategies for organising information when learning independently in the flipped learning unit, displaying considerable evidence of this aspect of self-regulated learning.
For the majority of participants, their organisational strategies were fairly basic, such as note-taking while reading or watching the online videos, and various simple methods of structuring essays or organising their ideas. Overall, 14 participants described organisational strategies of these types.

“I have a little notepad. I write down, do this reading and this one or when the assignment’s due, also I have to research some more of this part or that part.” (Anh, Interview 1)

“I kind of marked the pages that I think connect to the, to the, like, assignments.” (Bulana, Interview 1)

“I selected by the abstract and the conclusion, trying to get an idea of what they were talking about, and then I read all of them, highlighted, and always thinking about the question. Oh, that relates to [inaudible] that relates to this, that relates to teaching.” (Gabriela, Interview 1)

Seven of the students also reported using relatively more complex methods of organisation, such as detailed diaries or the use of mind-maps for organising their ideas, mainly alongside the more basic strategies of note-taking and structuring their work. Chun explained her systematic daily organisational strategy as follows:

“Every day I just try to write a diary and the simple notes, try to document my main idea, very fast in a short dot point, not in a sentence. When I was in the centre, I take the notebook, then dot point everything, then I go home and do a bit of review to try to remember what I did and what I observed today, then make the date, and then until the weekends, I see the notebook, what I document, and I do the reading, try to flashback, then link to the practical.” (Chun, Interview 1)

Similarly, Divina reported using a detailed notebook system for organising her time as well as her study material:
“For me it’s all like a timetable, so breaking down what I have to do. So it’ll be: Introduction, Body 1, Body 2, Body 3, and then Conclusion. So everyday I’d have an aim for what to finish at that day ... if I do that everything flows and connects to each other. So I know what I’m talking about … and I write everything down. Like every idea that I could potentially have, I’ll write it down and then see if it like links or it’ll fit. I don’t know, my book is like a huge mind map of thoughts.” (Divina, Interview 1)

The flipped learning unit provides students with a number of online resources, such as a learning guide and example assignments, which can be used for their organisational strategies. However, the findings indicated that these are used only to a limited extent. Just two students, Daisy and Fang, specifically reported using the learning guide to organise their work and time, although it was mentioned more frequently in the focus groups and interviews as a planning tool, as discussed in a later section. Only four of the students indicated that they had used the online examples of assignments as a template for their own assignments; in general, these were found to be helpful by those who used them.

“There were examples online. I used that as a basis for my structure. I read through it and see what they wrote in each paragraph and I put it as a topic for each one.” (Anh, Interview 1)

“I look at the exemplars and look at the commentary and how I can improve it and what they basically covered in all the paragraphs. I’ll try to deconstruct it before trying to do my own one.” (Divina, Interview 1)

Overall, these findings indicate that these students are adopting a variety of organisational strategies which demonstrate self-regulated learning on the flipped learning model, but that the resources provided to them by the university may not be proving very effective in facilitating or promoting organisational strategies. This is
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not to imply that the resources themselves are necessarily ineffective as organisational tools, the issue is that many students do not currently perceive these to be effective or have not utilised them sufficiently to become convinced of their value. This point will be discussed further in Chapter 6.

4.2.2.4 Critical thinking

This aspect of the learning strategies element of self-regulated learning refers to ways in which participants apply previous knowledge to new situations in order to solve problems, reach decisions, or make critical evaluations, and ways in which they articulate the purpose of these strategies.

Based on the interviews and focus group data, a number of participants emphasised that they always attempt to incorporate critical and original thinking into their work, however these accounted for less than half of the sample (N=8). In the following quote, Stephanie explains how the nature of the flipped learning unit helps her to think more critically in order to understand the material:

“It’s sort of more active so not just sitting there listening ... You are ... reading a lot of things and then having [to] work out how to answer all the questions yourself.” (Stephanie, Focus Group 1)

Among those who provided evidence of critical thinking, this was generally conveyed in the sense of thinking independently and questioning what they are learning, rather than just accepting information at face value. For example, Olivia explained that she uses “questioning” approaches, a strategy that has been found by other researchers to be associated with “deep learning” (e.g., Ballard & Clanchy, 1988) and the implications of which are considered in Chapter 6. This student explained:

“I’ve always been questioning. I’ve always wondered. You know, why? How does this happen? Why does this happen? And I don’t know whether that’s
partially intrinsic in me or you know, part of my upbringing was trying to understand what was going on.” (Olivia, Interview 2)

Critical thinking was also conveyed in terms of wanting to contribute something original to their work, as reflected in the following quotes, and demonstrating a high level of self-regulated learning for the students using these approaches. For these students, it appears that flipped learning promotes the use of critical thinking since they are encouraged to spend time reading alone and thinking independently about the material rather than just learning this from the instructor’s perspective in a classroom situation.

“If I have a look at the previous essay, my essay would probably tend to be more like that essay. Whereas I want to do my own way and then read through it and see what needs, do it my own.” (Ayu, Interview 1)

“I do what they want me to do but I also add in my own thing to make it more interesting.” (Stephanie, Interview 2)

Two of the participants who demonstrated evidence of critical thinking explained this further by explaining the processes they use when undertaking independent learning and how critical thinking is encouraged or facilitated by the resources and tools provided to them, such as the worksheets on which they are required to answer questions about the reading:

“You are sort of reading a lot of things and then having … work out sort of how to answer all the questions yourself.” (Stephanie, Focus Group 1)

“There are questions that you need to answer … based on the materials that you have learned online … those questions make you think … and make you understand … what you supposed to know.” (Fang, Focus Group 2)

That said, comments made at other points in the interviews and focus groups indicated that some participants lacked the willingness and/or confidence to think
critically about what they are learning. Potential limitations in critical thinking abilities were reflected in the responses of participants who had expected a high level of guidance and comprehensive instruction from teachers on the flipped learning model, and whose experiences or performance in the unit had been adversely affected by the expectation that they would have to complete most of the learning independently. For example, reflecting on her overall experience of the unit in Interview 2, Ruby explained:

“I thought that Uni was supposed to help you with the assessments and then give you, like, not answers, but give you guidance with how to do them and information with how to do them.” (Ruby, Interview 2)

4.2.2.5 Metacognitive self-regulation

The next aspect of the learning strategies element of self-regulated learning in Pintrich's (2004) framework is defined as metacognitive regulation, which is broken down into the three separate components of planning, monitoring, and regulating. Pintrich (2004) argued that self-regulated learners are capable of planning their learning activities, are self-aware of their actions in relation to those plans and work towards monitoring their progress, and engage in self-regulating activities where they are able to resist distractions and stay on track. The subsequent subsections present the qualitative findings relating to the evidence of these three components. This is followed by a subsection on quantitative trace data on metacognitive self-regulation.

4.2.2.5.1 Planning

The data from the interviews, focus groups, and learning logs indicated that the students were engaging in a variety of strategic planning activities for the semester’s work as a whole and for individual assignments. Their accounts indicated that most of these students broke down the assigned tasks into simpler components, and
planned when and where they could accomplish those components, in order to complete activities before scheduled deadlines. Although a variety of personalised planning strategies were used, which may reflect the relatively non-prescriptive flipped learning environment, over half (N=12) of all participants did report a specific method for planning their time and work. At one extreme, these included the detailed, systematic approaches used by Elena and Divina:

“I went through the assignment question, and I sort of deconstructed it ... and I would try and split it up, and say, by this day I want to have this completed, so I’d research it, and have it all done, beforehand. And then before I’d start for the next day, I’d make a list of what still needs to be done, and try and tick it off, as I went ... I always have an organised plan because otherwise I forget straight away that I need to do things so it’s worked for me.” (Elena, Interview 1)

“For me for any assignment like an essay type I need to basically understand the question to be able to thoroughly know what I want to talk about after I understand the question and what it is asking of me and then I will deconstruct it to different sections so that I can talk about it—the body, different sections that would make a strong case of my perspective and my thesis ... That’s basically it. I do a lot of planning.” (Divina, Interview 1)

Others reported more basic planning methods, but a common technique used by several (N=4) participants involved planning to work a little each day on an assignment in order to make consistent progress, or specifying the work to be completed on or by specific dates throughout the semester. For some, the learning guide provided for the flipped learning unit appeared to be an important planning tool, as reflected in the following quote from Fang:
“I go to the learning guide ... to see what are the assignments that I need to do and also I go to views to see ... what are learning materials for the week and then I complete those learning materials ... I look at the learning guide for the whole semester ... and then when those assignments come up ... you know ... it’s time to study assignment ... I go back to the learning guide to have a look in the assignment for more detail.” (Fang, Focus Group 2)

Overall, although a variety of different approaches to planning were used by the research participants, many did demonstrate this important aspect of self-regulated learning. Their responses suggested that the flipped learning nature of the unit necessitated a systematic approach to planning, and also that the resources provided to them, such as the learning guide, were important tools in supporting this process.

4.2.2.5.2 Monitoring

The monitoring aspect of metacognitive self-regulation, based on Pintrich’s (1991; 2004) model, involves tracking one’s self-attention, self-testing, and questioning. In this area of self-regulated learning, many of the research participants also cited the learning guide and other online materials such as the assessment criteria and example assignments as important tools in their monitoring practices. Overall, 13 of the participants said they had used at least one of these online tools that were provided as part of the flipped learning unit materials, to ensure they were on track in terms of meeting both the completion dates and the required standards.

“I kept referring back to what the guidelines were saying and every time that I’d look at what was expected I’d go back and make sure that I had completed that and went through it as well ... [The examples] also helped me like scaffolding it properly and making sure it was alright.” (Elena, Interview 1)
“I mean, during, during I writing my assignment I would constantly check my marking criteria. Yeah. So whether, to see whether I state this clearly, so this part, does my part meet this standard?” (Ting, Interview 1)

The learning guide was most commonly used, with 10 of the students indicating that they had used this to monitor their progress and stay on track. Stephanie, for example, indicated that she uses the weekly goals set out in the guide to plan and monitor her work. Similarly, Elena explained:

“I kept referring back to what the guidelines were saying and every time that I’d look at what was expected I’d go back and make sure that I had completed that and went through it as well.” (Elena, Interview 1)

However, these findings also suggest that the remaining seven participants (around a third of the sample) may not be systematically using the online unit materials to monitor their progress. The following quotes illustrate the ways in which two of the participants explained how they monitor progress against their own plans for individual assessments and the unit as a whole:

“Making sure that every dot point I wrote was in my essay ... I won’t get to the next point until I finished the first point. For example, after writing the first point in my essay then I move to my next point and make sure that I just, kind of, check it off, tick it off. So then that allows me to make sure that everything that I had planned is within my essay kind of thing.” (Kya, Interview 1)

“I had my list of when I wanted it done. I’d keep on going until I felt that I had done enough for a day and then I’d make sure that I wasn’t falling behind in my little list. It kept me on top of it and that helped me to make sure I could have it ready.” (Elena, Interview 1)
4.2.2.5.3 Regulating

The metacognitive strategy of regulating is defined in Pintrich’s (1991; 2004) framework as the fine-tuning and continuous adjustment of one’s cognitive abilities, including checking and correcting of a learner’s behaviour as they proceed with a task. In this context, some participants reported self-reviewing their work and making changes based on identified ways in which it could be improved. Four of the participants reported that they leave their completed work aside for some time and go back to review it with a clear mind before submitting, to help determine whether it meets the required standards or needs any revisions.

“I just read them all again. I make sure that all my arguments make sense.”

(Bulana, Interview 1)

This appears to be an effective self-regulated learning strategy that enables learners to evaluate their work more objectively than would be possible when reading it immediately after completion.

“I try to finish one often before starting on the other, I think it phases my mindset of doing assignments, so once it’s done it’s done and then if I have time before the due date then I’ll leave it for a bit and then read it again before it’s due.” (Divina, Interview 1)

“Sometimes with some of it I leave it, because I may have to add a little bit more, and then I re-read it and see where I can add things, because sometimes, yeah, I kind of always write that many words so I have to like, leave it and go back and think, ‘Oh yeah, I haven’t explained this very well so, I’ll explain that more’.” (Daisy, Interview 1)

The online quiz was also mentioned by two participants as being an important tool for checking their learning and identifying areas where additional work is needed. One indicated that as part of her monitoring and regulation strategy, she
sought feedback on draft assignments from the course tutor before they are submitted.

Before completing the discussion of the qualitative findings in this area, it is worth noting that, in broad terms, the younger participants in the sample appeared to be more likely than older students to be actively using learning strategies such as organisation, critical thinking, and metacognitive regulation. It is unclear why this should be the case, and the finding is a very tentative one given the qualitative nature of the study. It is possible to speculate, however, that younger students may be less likely to have ingrained notions about traditional forms of education in which teachers play a dominant role and independent learning is less important, and may therefore be more likely to adopt these behavioural patterns and strategies.

4.2.2.5.4 Quantitative findings

Information on the use of metacognitive self-regulation (planning, monitoring, and regulating) can be also inferred from the types of items accessed by students in the online portion of the flipped learning unit. It can be expected that evidence of these metacognitive activities might be demonstrated, for example, by the use of certain types of online resources that can be used to plan work, identify the required standards, and help students to continually check and adjust their work to ensure that it meets these standards. These can be expected to include, for example: the course introductory material and description (planning); and the assignment information, Turnitin tutorials, and weekly worksheets (monitoring and regulating).

The data in Tables 4:1 and 4:2 and Figures 4-2 and 4-3 suggest that, despite their self-reported usage of the online unit resources, many of the students may not in practice be exhibiting metacognitive regulation by making extensive use of the available online resources for planning, monitoring, and regulation purposes. However, the qualitative findings reported in the previous subsection do provide
Chapter 4: Findings I: Forms of Self-Regulated Learning

Evidence of planning, monitoring, and regulating activities among at least some of the participants. Overall, the combined results suggest that there may be some limitations within the overall sample in metacognitive self-regulation behaviours, relating to the nature of the flipped learning model and the difficulties that some students encounter in independently planning, monitoring, and regulating their own work.

4.2.3 Resource management strategies

Resource management strategies comprise the third main element of Pintrich’s (1991; 2004) self-regulated learning model. This dimension of the model is based on the argument that a learner must not only engage in cognition to demonstrate self-regulated learning, but must also manage his or her time and study environment to ensure this supports their learning. In the model, resource management strategies are also defined to include regulation of one’s own learning effort, peer learning, and help-seeking strategies. The research data from the interviews, focus groups, and learning logs were therefore analysed to identify examples of these resource management strategies among the research participants.

4.2.3.1 Time management

In Pintrich’s model, the time management aspect of resource management involves scheduling, planning, and managing one’s study time, including setting realistic goals and making effective use of study time. In this research, most of the participants were found to be clearly aware of time constraints that they faced in working on their assigned tasks, which arose due to family or employment responsibilities as well as the demands of other academic units. In response to these time constraints, there was evidence that many were actively engaging in different time management activities and strategies, such as allocating specific time to
particular activities and prioritising: in total, 15 of the participants mentioned some kind of strategy or method they use for managing their time and ensuring that assignments are completed by the submission deadline.

Half of all the participants (N=10) indicated that they set aside specific blocks of time to work on assignments, or allocate particular days of the week to work on their studies. For example:

“I think I had a set day where I worked on it, like I think Mondays when I wasn’t in class for Theorising Play, I would work on the assignment. Yeah, that was pretty much it. Just setting time to get things done.” (Stephanie, Interview 1)

“I’m just going to work on the Monday and Friday and not on the weekends. So I will work one Sunday every month and that’s it. Like on the weekends now so I’ve got all weekends to do assessments and studies.” (Grace, Interview 1)

Three of the participants reported the use of specific systems for prioritising their assignments, as illustrated in the following accounts:

“[S]o what I try to do ... is get my diary ... puts everything I have to do ... like this week I have to do this and that ... and then I highlight what is the deadline is coming ... I like to work like that ... like killing a lion every day ...[laughing] ... get everything done ... otherwise you get crazy ... you start thinking ... and I tend to procrastinate ... if I don’t have ... clear idea about what I have to do ... so I have this mindset this is this this is that let’s do it ... it’s working I think.” (Gabriela, Interview 1)

“[E]very minute counts for me ... trying to see what is ... the most important things in your life for now ... and try to prioritise from the most important to the least ... and see if you can eliminate the least important things ... for
example ... I might have a shift on Saturday .... So you might cancel that and work on your assignment for example” (Kya, Interview 1).

Another three reported the use of strategies in which they made good use of limited time by working on a task in piecemeal fashion.

“I try to at least aim for a paragraph [each day] and then I know I’ll be on track, because if I leave it till the last minute it’s going to be hard to write the whole thing.” (Anh, Interview 1)

Half of the participants (N=10) admitted that they often did work at the last minute; however, the accounts indicated that this was not so much due to a lack of time management skills, but a combination of workload pressures and a deliberate strategy developed in recognition of the fact that they made more effective use of time when under the pressure of a deadline, an interesting finding that is examined in Chapter 6.

“Some people really like the process of doing it like and being well prepared. I’m not as, like that. I like to look at it pretty much last minute.” (Grace, Interview 1)

“In some subjects I tend to do my work better when it comes to leaving it until the last minute but I think making me get all the information and then putting it all together towards the end makes me do my work better.” (Elena, Interview 2)

Further examination of the distribution of responses by the demographic characteristics of participants revealed that those who reported finishing their work well in advance of deadlines (N=3) were all aged over 25 with higher levels of education, and that those who reported working well under the pressure of a deadline were mostly younger (19 to 21) (N=17). Although this can only be a very speculative finding, given the nature of the data, it may suggest that the time
management aspect of self-regulated learning may develop over time and with greater experience of education.

4.2.3.2 Environment management

Environment management, in Pintrich’s (2000, 2004) model refers to management of the setting where work is carried out, which should ideally be well organised, quiet, and free from distractions.

Seven of the participants indicated that they were conscious of the type of environment that they need to promote effective studying, and that they take steps to ensure this is in place. For five of these participants, this was a quiet environment free from distractions or with all the necessary resources easily accessible.

“If there’s all the other distractions, then you’re not fully making sure that you’re doing the work and you can be writing other things that you’re thinking. With no distractions, it helps you write a clear essay.” (Elena, Interview 1)

“I try to come to the library once in the weekend. ... there is no distraction around me so I can focusing on my reading ... but at home ... there’s a TV ... my siblings ... it is just too much noise ... and the reading doesn’t go through.” (Manhoor, Focus Group 2)

However, two participants reported that they need activity around them or background music to put them in the right frame of mind, demonstrating that the ideal type of study environment is very personal, and that a self-regulated learner is one who recognises what this consists of for them.

“I can’t just sit down. I’m usually a fidgeter. I can’t sit down and work on my stuff and not move and not hear music and stuff. So, while I’m listening to music, my legs are moving and stuff like that. That’s the way for me to engage in stuff.” (Ayu, Interview 1)
“I need to have something going on in the background whether it’s music or taping or something. Actually, most of the time that I am studying, I do actually have music on .... It is just something about the music that calms me.” (Daisy, Interview 2)

Two of the students mentioned that they face difficulties in securing a suitable study environment at home and either did their work at the university whenever possible, or worked at night when there were fewer distractions. This indicates that flipped learning may have an impact on the effectiveness of self-regulated learning for those students whose home environments are not well aligned with their ideal study settings.

“I usually normally do my work at Uni because ... It’s more a learning environment than if I was to do it at home with all of the distractions. So I find Uni, in the computer labs in room 24, it’s very quiet, and everyone is just doing their work and that motivates me to do my work too.” (Kya, Interview 1)

“It’s really hard at my house. Because my house is so noisy. Because there are so many of us in it. So, it’s got to be around 8:00 p.m. at night. Everyone is quiet. No one is talking. I stay up until 9:00 p.m. on the weekends.” (Ruby, Interview 1)

Overall, these findings demonstrate that participants were generally able to engage in a wide range of resource management strategies. Despite constraints in time and the presence of distractions, participants were able to employ strategies to keep their focus on the task at hand. As discussed by Pintrich (2004), these actions are indicative of self-regulated learning.
4.2.3.3 Effort regulation

Effort regulation is the aspect of resource management that relates to the learner’s ability to control their own effort and attention when faced with distractions or tasks that hold little interest for them. Ten of the participants in this study described ways in which they regulate their effort, particularly when facing the pressure of an assignment deadline.

For six of the students this involved avoiding distractions, for example by physically moving themselves to a less distracting environment or by turning off their phone to avoid being distracted by its functions, as illustrated by the following quotes:

“I started writing in my room. But I had a lot of distractions in it, so I went in a dining room, shut the door, and just sat and wrote. And studied and read, then wrote.” (Grace, Interview 1)

“I didn’t actually touch my phone—I just focused on my assignment. I did go on my iPad to do the reading, but I didn’t play music or anything like that. For about half an hour at the time. It didn’t last long, but it was more the fact that I didn’t always, you know ... It wasn’t always in my hand, and I wasn’t always looking.” (Daisy, Interview 1)

Five of the participants, including four of those who reported strategies that involved minimising distractions, explained that when faced with work pressure they make a proactive effort to really focus on the work, indicating a strong ability to self-regulate their learning in this respect.

“Normally, on the last day if I haven’t finished it: I’m like: Don’t talk to me. I am not moving from this chair until it is finished. And also it helps if I don’t procrastinate. I’m like: If I have to do this ... I am really focused on this.” (Daisy, Interview 2)
“I basically turned everything off and then I made sure I looked at the computer and said: I have to do this ... if I don’t ... it would not be in by the due date.” (Xia, Interview 1)

Three of the participants also reported ways in which they manage their effort when feeling overwhelmed or needing a break from work. For example:

“I would stop, leave everything where it is, just go out, and have a drink of water or something and then come back in and try to get my head around it again.” (Anh, Interview 1)

“When I’m really frustrated, ‘cause the head is too full, and there is kind of headache, I need to drop off and take a good dinner, maybe hang around with my friend, then have a good sleep then start again.” (Chun, Interview 1)

4.2.3.4 Peer learning

Peer learning refers to collaboration or dialogue with one’s academic peers, something that Pintrich (2000; 2004) argues can have positive impacts on learning by enabling a learner to clarify points and achieve new insights. The challenge in flipped learning is to facilitate and promote the use of peer learning when students are working remotely and independently for the majority of the time.

At various points in the interviews and focus group discussions, more than half (N=12) of the participants stressed their preference for collaborative or classroom-based learning, referred to by Ayu (Interview 2) as “social learning”. The following two students represent examples of those who indicated that this is aligned with their learning styles, and that they value the ability to gain different perspectives on an issue.

“I have my way of thinking and everyone has their own way of thinking and their own way of seeing things and I don’t know everything and it’s nice to
have the other students say their point of view so I can hear it from someone that’s learning as well, they can tell me what their perspective of that is because I’m not one of those people that raises their hands and asks all sorts of questions in class.” (Daisy, Interview 2)

“I think this approach ... is personally ... more beneficial for the students to learn ... because they share each other’s ideas ... because they everyone has an input of what they think about what that topic is ... not just sitting down and listen to what one person has got to say.” (Kya, Focus Group 4)

Overall, the findings indicated that the flipped learning unit provides very few opportunities for collaborative and peer learning due to the limited amount of classroom time, and suggests that this aspect of self-regulated learning is very limited among this sample of students. Grace explained this in one of the focus group discussions as follows:

“It’s not only ... the lack of face-to-face with the teacher ... you’re not getting more ideas. ... and the feedings of the people around you ... because you’re at home ... I got more in 10 minutes’ conversation than I did about three weeks of the online work.” (Grace, Focus Group 6)

The trace data also indicated that the students made very little use of the available online facilities for peer learning, indicating that these tools might not provide an adequate substitute for face-to-face peer collaboration in the flipped learning environment. As discussed in the following subsection, only 51 instances of discussion board activity were recorded during the semester.

4.2.3.5 Help seeking

The final aspect of the resource management strategies of the self-regulated learning model refers to the ability of learners to recognise when they need the help
of others to support their learning, and to identify an appropriate person from their peers, teachers, or other individuals.

Overall, the participants in this study did not express a wide range of help-seeking strategies, which is perhaps a reflection of the flipped learning environment in which they have limited access to instructors, peers, and other forms of support.

Three students did report asking questions of the teacher, either during tutorials or by email. For example, Ting reported,

“If there’s no chance to talk with my tutor I would post my question online. But, normally, I would prepare my questions ask her in the class.” (Ting, Interview 2).

Attempting to seek help while working from home was sometimes unsuccessful due to reported delays in response, as illustrated in the following quote from Xia’s first interview:

“I’ve emailed a couple of times and it takes them like a whole month to respond one email back. I know it gets really busy but sometimes I need to ask a question and it doesn’t get responded back.” (Xia, Interview 1)

However, the following quote from Ting indicates that students may sometimes seek help when they could have found the answers themselves.

“Sometimes I post my question and after two hours later I find the answers myself. Then I keep going and I just ignore the question that I post.” (Ting, Interview 2)

Relatively few examples were cited of help seeking from peers (N=5). However, when this strategy was adopted it appeared to be more successful than when seeking help from the instructor:
“I usually email the teachers but I don’t get feedback straightaway so I go ahead and ask my friends instead because they give me quicker feedback because they already know how to do it.” (Xia, Interview 1)

“We communicate to each other and we put our views and with their good support and network we all have the same education through TAFE. And we know other things so we go to each other for clarification.” (Grana, Interview 2)

In the online learning course, a discussion board / forum area was provided for this purpose, where students were able to post comments and questions and seek advice from their peers and from instructors. By examining the trace data, it is possible to tell whether the students were using the discussion boards in practice to seek help or to discuss their assignments and learning with their peers.

The trace data revealed that the participants made little use of the discussion boards, with a total of just 51 postings by all students during the semester. Figure 4-4 shows the distribution of these postings by individual discussion board. This shows that around half of all activity (45%) was on the Weekly Topics discussion board, while just under a third in total (31%) was on Assignment discussion boards, nearly all of which (29%) was on the Assignment 2 discussion board. The remainder (24%) of postings were on the Professional Experience discussion board.
Figure 4-4 Discussion board activity by topic (N=51)

Overall, this data indicates that the online opportunities for peer learning and help-seeking provided in the flipped learning unit are not effectively promoting these self-regulated learning activities among the students, as evidenced by their interview and focus group contributions as well as their patterns of use of the online discussion boards. One of the potential reasons that emerged from the qualitative findings is that the infrequency of personal contact between students hinders the development of the familiarity and personal bonds necessary to promote collaborative working. Some support for this is potentially provided by the quantitative finding that there were very few comments posted on the Assignment 1 discussion board, but considerably more on the Assignment 2 discussion board. When completing Assignment 2 later in the semester, students would have become more familiar with one another and perhaps more likely to feel comfortable in discussing the work and seeking help from their course peers.

The qualitative finding that students were sometimes unable to receive timely responses from their tutor when posting questions online may also have discouraged
them from using the discussion boards for this purpose. Further investigation of the trace data revealed that the average response time for replies to questions posted on the discussion boards was two days, supporting the participants’ accounts of long delays that were hindering their work progress.

Some participants reported using family members or friends (“others” within Pintrich’s framework) to check their work, especially if they have relevant experience; five students indicated that they had used this form of help-seeking strategy. For example:

“I have one friend she did the translation degree before so she’s a professional! ... Didn’t help me to write, but still keep my meaning. Keep my opinion but try to make the essay in a logical way.” (Chun, Interview 1)  

“My brother got two degrees and stuff and he is good at essay writing and stuff and he would go through it ... my mum worked with kids for like ten years, so she had a clear idea about this stuff.” (Elena, Interview 2)  

Another source of help from others mentioned by some participants, especially those whose first language is not English, was the editors/proofreaders available at the university; six of the students had used the services of these individuals. However, the experiences of using these were not always positive, because of their lack of specific knowledge or understanding of the subject matter.

“I took it to the man in the library downstairs. He usually proofreads the essays and gives you feedback on how it is. And I got him to read it for me and there was places where I missed, like, commas and certain, like, little errors that he corrected before I submitted it. Yeah.” (Kya Interview 1)  

“I tried once. They just fixed it really fast. Because when you want to fix an essay for a person you need to know the meaning, what she wants to express, what she wants to say in this essay ... They have no time to
communicate with you. They just change it in right way, what they think is right. Because they have no professional background, they don’t understand sometimes.” (Chun, Interview 1)

Overall, these findings suggest that the participants were generally able to engage in a wide range of resource management strategies, even though these were not always successful due to factors outside of their control. Despite constraints in time and the presence of distractions, participants were able to employ strategies to keep their focus on the relevant task. They also were also able to utilise a range of help-seeking strategies and recognised the value of the opinions of others in shaping their own thinking in doing their assignments. As discussed by Pintrich (2004), these actions are very descriptive of self-regulated learning.

4.3 Chapter Summary

This chapter has presented the findings of the study relating to sub-research question 1: **What forms of self-regulated learning are demonstrated by students in the flipped learning model?** Based on the experiences of a sample of 20 students enrolled in a university-level flipped learning unit, and using Pintrich’s model of self-regulated learning as an analysis framework, the study has generated considerable evidence of the various aspects of self-regulated learning set out in the model among this group of students. In regard to the element of motivational strategies, for example, many of the students demonstrated an ability to identify specific types of intrinsic or extrinsic goals, evaluate the value of tasks, and allocate their time accordingly.

However, the findings also revealed differences between the participants, with some exhibiting many of the characteristics of self-regulated learning as identified in Pintrich’s model, while others exhibited few of these characteristics. This was
shown in the area of expectancy, in that a small number of participants indicated that they perceive a high level of control over their learning beliefs, and have high self-efficacy, while others expressed the view that within the flipped learning model they have little control over their learning outcomes. In regard to the elements of learning strategies and resource management strategies, there were again differences within the sample, with around half or less exhibiting the various types of self-regulated learning behaviours set out within this part of Pintrich’s model. The results have also shown that, in some respects, the flipped learning model seems to hinder rather than promote self-regulated learning. For example, the unit appears to encourage the use of self-regulated learning strategies such as planning, monitoring, and time and environment management, at least for some learners. But it was found that the peer learning and help-seeking aspects of self-regulated learning were very limited in the majority of this sample because the structure of the unit and the available support and resources did not support collaborative learning and seeking help from teachers and peers. These findings and their implications will be considered further in Chapter 6, along with the findings relating to sub-research questions 2 and 3, which are presented in the following chapter.
5 FINDINGS II: FACTORS THAT INFLUENCE SELF-REGULATED LEARNING

5.1 Introduction

This chapter presents the findings relating to the second and third sub-research questions of this qualitative study which examined the role of the flipped learning model in self-regulated learning, based on the views and experiences of a group of students enrolled in a university-level flipped learning program. The main research question of the study was: **What is the role of the flipped learning model in self-regulated learning in the context of higher education?** Sub-research question 2 was: **What are the possible factors that influence students’ self-regulated learning in the flipped learning model?** Sub-research question 3 was: **How is students’ self-regulated learning being shaped by the flipped learning model?**

As in the case of the previous chapter, which presented the findings relating to sub-research question 1, this chapter incorporates qualitative research findings from interviews, focus groups, and learning logs, as well as some quantitative results from the trace data that provide a record of students’ behaviours while interacting
with the online content (via Blackboard) in the flipped learning unit. The research findings relevant to each sub-research question are reported in the present chapter, and are discussed more fully in the context of previous literature, and with consideration of their practical and theoretical implications, in Chapter 6. See Appendix L for a tabular summary of key findings from each subsection of this chapter. (Note that this summary is necessarily selective: it does not incorporate all aspects of the findings detailed below.)

5.2 Factors that Influence Self-Regulated Learning in the Flipped Learning Model

In order to determine what role the flipped learning model can play in self-regulated learning in the context of higher education, it is necessary to understand the range of factors that influence the ability of learners to undertake self-regulated learning in a flipped learning environment. By identifying these factors, flipped learning programs can be designed in ways that support and promote self-regulated learning. Inductive analysis of the focus-group and one-on-one interview transcripts, as well as the student learning logs, were therefore used to identify the main influences on self-regulated learning among the sample of learners in this flipped learning unit. Nine factors were identified in total: four relate to the characteristics and circumstances of individual students, and the remainder relate to the design and content of the flipped learning unit. Each factor is discussed in turn in the following subsections, with excerpts from the interviews, focus groups, and learning logs used to illustrate the ways in which each factor appears to influence self-regulated learning in the case study flipped learning unit. Relevant quantitative findings from the trace data analysis are also included in some sections of the results, where this data proved to be useful in adding to or clarifying the qualitative findings. By way of summary of the data, Table 5:1 below shows the results of the coding, with
Chapter 5: Findings II: Factors that Influence Self-Regulated Learning

respect to the research questions’ themes, sub-themes, the type of responses by participants, and frequency of responses by the participants.
### Table 5:1 Participant Responses to Research Question Themes

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Main themes</th>
<th>Sub-themes</th>
<th>Type of Participant Response</th>
<th>Numbers of Participants</th>
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<td>Student-related influences</td>
<td>Learning style and preferences</td>
<td>Independent learners</td>
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<td></td>
<td>Need more support</td>
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<td></td>
<td>Need peer interaction</td>
<td>3</td>
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<td></td>
<td></td>
<td>Skills and abilities</td>
<td>English language difficulties</td>
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<td>Workload management difficulties</td>
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<td>Level of interest and motivation</td>
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<td></td>
<td>Time constraints and other commitments</td>
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<td>Program structure</td>
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<td>Positive comments</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Negative comments on materials</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not relevant to career</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assessment methods</td>
<td>Positive comments</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unclear assessment methods</td>
<td>6</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>Unfair assessment methods</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Technological aspects of delivery</td>
<td>Importance of technology</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experience of technical problems</td>
<td>10</td>
</tr>
<tr>
<td>Ways the FLM environment fosters SRL</td>
<td>Promoting independent learning</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------------------------</td>
<td>----</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improved engagement</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flexibility</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ways the FLM environment hinders SRL</td>
<td>Confusing or unhelpful delivery of learning</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inadequate support and guidance</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lack of practical relevance</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insufficient engagement and collaboration with peers</td>
<td>14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.2.1 Influence of personal differences between students

5.2.1.1 Learning styles and behaviours

The personal learning styles and associated behaviours of individual students appear to be key factors influencing their experience of the flipped learning model. Those who claim to be naturally independent learners or who welcome the opportunity to study at their own pace generally reported more positive views about the flipped learning unit and appeared to be more self-regulated learners who exhibited a range of the behaviours set out in Pintrich’s model and discussed in Chapter 4. This section draws on qualitative data from the interviews, focus groups, and learning logs, as well as the quantitative trace data, to explore the apparent impact of learning styles on the experiences of flipped learning, and the ways in which this appears to be manifested in the students’ use of the online learning system.

Among this sample, around a third (N=7) indicated in their interviews and focus group discussions, or noted in some form in their learning logs, that they are independent learners. These participants pointed out that the structure of the flipped learning unit helps them to engage with and understand the material better than if they were being taught in a traditional classroom. In particular, this group stressed the benefits of being able to study at their own pace and learn material in advance of tutorials.

“I think that I am an independent learner, as I find it easier to study and learn by myself so this sort of learning was good for me as I could learn at my own pace.” (Elena, Learning Log 3)

“That’s much better for me ... because when I go to class ... if they ask the question directly ... my mind gets blank. So I like to understand before I go
Chapter 5: Findings II: Factors that Influence Self-Regulated Learning

to class ... read over it and understand what was supposed to be learning ...

I feel more comfortable working on my own.” (Anh, Focus Group 3)

However, more than half of the participants (N=12) indicated that flipped learning was not well suited to their personal learning style. This was the case for those who struggled to motivate themselves to work independently and who preferred more interactive, teacher-led methods of learning or visual teaching methods rather than independent learning.

“I think I definitely need that person in front like, in the room talking. I think I respond well to the answer the questions there in the moment. I can answer them or I can give another question. And to hear other people’s thoughts too is really nice. And can sort of make you think about your own thoughts and compare the two and stuff like that.” (Grana Interview 2)

“You can’t put a textbook in front of me and tell me to read it and learn it. I just don’t learn that way. I’d rather go out and do something practical and interesting and engaging. That’s how I learn.” (Ruby, Interview 2)

Three of the participants emphasised the importance to them of interacting with other students in a classroom situation, and highlighted the ways in which this interaction was more satisfying as well as more instructive for them than learning independently.

“My style of learning is through discussion and analysing so I can hear other people’s opinions and thoughts.” (Daisy, Learning Log 3)

“I would rather have a class, meet people, make friends, talk about people’s days and lives. Because you learn more this way ... I think it’s more enjoyable.” (Gabriela, Interview 2)

“As I learn through peer discussions, I am not able to deepen my understanding regarding topics in worksheets.” (Ayu, Learning Log 3)
One way in which learning styles might influence experiences of flipped learning is in the way they affect students’ interactions with the online learning system. Analysis of trace data from this system was therefore carried out to identify any differences in patterns of activity between the research participants. Although it cannot be conclusively inferred that any observed differences in online activity correspond with differences in learning styles, these will at least convey a sense of the different types of experiences of self-regulated learning that occurred in this flipped learning unit. For example, although only a crude measure of learning behaviour, it might be expected that those students who have a more independent learning style will spend more time in the online learning system, while those with different learning styles may feel less comfortable with the independent use of this system and therefore spend less time interacting with it.

Analysis of the trace data did indeed reveal considerable differences between participants in terms of the total time spent in the online unit, as shown in Table 5:2. Total amounts of time in the online unit ranged from just 36 minutes to 2829 minutes (47 hours), with a median of 300 minutes (5 hours). The median value is a more accurate reflection of the overall online activity of the sample than the mean, M=802 minutes (13 hours), since the mean value is skewed by the atypical activity of one student (Daisy) who accounted for 17.6% of all student time in the unit during the semester, and is discussed further below. At the other extreme, five students jointly accounted for less than 10% of all time spent on the program, with Fang and Ruby in particular spending less than 1 hour each on the unit’s website during the semester. It must be noted that some forms of activity were excluded from the trace data, so the actual levels of activity for each student may in practice have been higher than these figures suggest. Nonetheless, this data does reveal considerable differences between students in terms of time spent in the system.
Table 5:2 Total minutes spent in online unit by research participants

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Total minutes in online unit by individual</th>
<th>Percentage of all time in online unit by research participants (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daisy</td>
<td>2829</td>
<td>17.62</td>
</tr>
<tr>
<td>Gabriela</td>
<td>1386</td>
<td>8.63</td>
</tr>
<tr>
<td>Anh</td>
<td>1356</td>
<td>8.45</td>
</tr>
<tr>
<td>Heidi</td>
<td>1330</td>
<td>8.28</td>
</tr>
<tr>
<td>Stephanie</td>
<td>1313</td>
<td>8.18</td>
</tr>
<tr>
<td>Ting</td>
<td>1236</td>
<td>7.70</td>
</tr>
<tr>
<td>Olivia</td>
<td>974</td>
<td>6.07</td>
</tr>
<tr>
<td>Manhoor</td>
<td>893</td>
<td>5.56</td>
</tr>
<tr>
<td>Nanami</td>
<td>797</td>
<td>4.96</td>
</tr>
<tr>
<td>Xia</td>
<td>670</td>
<td>4.17</td>
</tr>
<tr>
<td>Divina</td>
<td>627</td>
<td>3.91</td>
</tr>
<tr>
<td>Ayu</td>
<td>578</td>
<td>3.60</td>
</tr>
<tr>
<td>Elena</td>
<td>485</td>
<td>3.02</td>
</tr>
<tr>
<td>Chun</td>
<td>436</td>
<td>2.72</td>
</tr>
<tr>
<td>Grana</td>
<td>365</td>
<td>2.27</td>
</tr>
<tr>
<td>Bulana</td>
<td>288</td>
<td>1.79</td>
</tr>
<tr>
<td>Grace</td>
<td>236</td>
<td>1.47</td>
</tr>
<tr>
<td>Kya</td>
<td>174</td>
<td>1.08</td>
</tr>
<tr>
<td>Fang</td>
<td>47</td>
<td>0.29</td>
</tr>
<tr>
<td>Ruby</td>
<td>36</td>
<td>0.22</td>
</tr>
<tr>
<td>TOTAL</td>
<td>16,056</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Indeed, it is those students who indicated in their interviews, focus groups, or learning logs that they prefer independent learning who are also recorded as spending the highest amounts of time in the online unit, as might be expected. Of the five students who spent the most time online (accounting for 51% of all time spent by the research participants in the unit), four of these—Daisy, Gabriela, Anh, and Stephanie—all provided qualitative information indicating an independent learning style. In contrast, another group exhibiting very low levels of online activity consisted of Ruby, Fang, Bulana, Grace, and Kya. With the exception of Kya, these were all students who indicated in their interviews, focus groups, or learning logs that they prefer a more supported and collaborative style of learning,
involving more face-to-face interaction with instructors and peers. The remaining students exhibited moderate levels of online activity.

![Figure 5-1 Online activity by time, units accessed, and total interactions (N=20)](image)

In very broad terms, there also appeared to be an association between total time spent in the online unit, numbers of interactions, and numbers of folders accessed, as shown in Figure 5-1, which appears to be supportive of the notion that more independent learners are more highly motivated by the flipped learning model and are thus more active learners. However, there were a couple of notable exceptions. First, although Daisy spent much more time in the online unit than the other students, her total number of interactions (captured in terms of individual instances of access to online folders) were not notably higher than the average (see Figure 5-
1). Second, the highest number of interactions (1969) was recorded by Olivia, whose total time spent online was somewhat lower than a number of other students at around 16 hours (Table 5:2, Figure 5-1). Some information is also available from the trace data on forms of interactions with the online system, based on instances of access to different types of online folders, as shown in Figure 5-2. Unfortunately, the trace data system did not record all types of interactions, so this is not directly comparable with the total activity data shown in Table 5:2 and Figure 5-1. Although the data in Figure 5-2 is based on lower overall numbers of interactions, it does provide insights into the broad distribution of forms of online activity, in terms of types of folders accessed, by the individual research participants.
In particular, Figure 5.2 data reveals that although Olivia had considerably more online interactions (instances of access to online unit folders) than other students, her interactions largely consisted of discussion board activity rather than activity in the learning content areas of the program. Olivia is a mature student who had not been in an educational environment for many years before enrolling in this program. In her interviews and focus group discussions she indicated that she was very active in seeking advice and assistance. This may explain the high number of interactions recorded for this student. It also demonstrates that, at least in terms of help seeking,
and resource management aspects, this student is a self-regulated learner despite the fact that she did not identify herself as an independent learner in her interviews and focus group contributions. However, although there were also slightly higher levels of discussion board activity recorded by other students with high overall levels of online activity (Gabriela and Heidi), accessing content items represented the vast majority, or all, of the interactions for the other participants.

The detailed trace data was therefore examined within the content area of the system in order to identify any notable differences between the group of participants identified earlier as more motivated self-regulated learners and those identified as less proactive in self-regulated learning (Table 5:3 and Figure 5-3). The bars in Figure 5-2 represent 100% of the online activity for each learner regardless of differences in the amount of overall activity, which enables easier comparison of the distribution of activity for each student regardless of her total amount of online activity. However, when interpreting this data, it should be noted that the total number of content-related interactions ranges from just 135 (Daisy) to 859 (Olivia) (Table 5:3).

Daisy, one of the students identified earlier as a self-regulated learner, spent a relatively small proportion of her content item interactions in assignment folders, and a very large proportion on learning materials, but this does not seem to be a common pattern for other self-regulated learners in the sample. Daisy appears to represent an anomaly in the research findings, since, despite exhibiting some characteristics of a self-regulated learner, she expressed views that were strongly opposed to flipped learning in her interviews and learning log, and also indicated that she gets easily distracted. This may explain why she spent a large amount of time online but had relatively few interactions, and highlights the importance of
taking a wide range of indicators into account when determining whether students are self-regulated learners.

Table 5:3 Distribution of online system activity by type of folder accessed

<table>
<thead>
<tr>
<th>Student</th>
<th>Assignments</th>
<th>Learning materials</th>
<th>Home page</th>
<th>Field visits</th>
<th>Unit info</th>
<th>Other</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olivia</td>
<td>356</td>
<td>192</td>
<td>161</td>
<td>58</td>
<td>55</td>
<td>37</td>
<td>859</td>
</tr>
<tr>
<td>Kya</td>
<td>124</td>
<td>178</td>
<td>91</td>
<td>123</td>
<td>28</td>
<td>17</td>
<td>561</td>
</tr>
<tr>
<td>Nanami</td>
<td>53</td>
<td>209</td>
<td>71</td>
<td>92</td>
<td>24</td>
<td>29</td>
<td>478</td>
</tr>
<tr>
<td>Xia</td>
<td>120</td>
<td>101</td>
<td>45</td>
<td>142</td>
<td>45</td>
<td>5</td>
<td>458</td>
</tr>
<tr>
<td>Gabriela</td>
<td>107</td>
<td>126</td>
<td>107</td>
<td>89</td>
<td>17</td>
<td>12</td>
<td>458</td>
</tr>
<tr>
<td>Heidi</td>
<td>107</td>
<td>73</td>
<td>129</td>
<td>65</td>
<td>66</td>
<td>10</td>
<td>450</td>
</tr>
<tr>
<td>Bulana</td>
<td>111</td>
<td>67</td>
<td>74</td>
<td>100</td>
<td>42</td>
<td>14</td>
<td>408</td>
</tr>
<tr>
<td>Divina</td>
<td>154</td>
<td>87</td>
<td>59</td>
<td>47</td>
<td>57</td>
<td>2</td>
<td>406</td>
</tr>
<tr>
<td>Ruby</td>
<td>177</td>
<td>58</td>
<td>109</td>
<td>28</td>
<td>11</td>
<td>8</td>
<td>391</td>
</tr>
<tr>
<td>Elena</td>
<td>98</td>
<td>90</td>
<td>61</td>
<td>83</td>
<td>40</td>
<td>4</td>
<td>376</td>
</tr>
<tr>
<td>Anh</td>
<td>74</td>
<td>134</td>
<td>83</td>
<td>58</td>
<td>8</td>
<td>14</td>
<td>371</td>
</tr>
<tr>
<td>Fang</td>
<td>33</td>
<td>145</td>
<td>32</td>
<td>42</td>
<td>31</td>
<td>18</td>
<td>301</td>
</tr>
<tr>
<td>Stephanie</td>
<td>86</td>
<td>95</td>
<td>57</td>
<td>12</td>
<td>16</td>
<td>7</td>
<td>273</td>
</tr>
<tr>
<td>Ting</td>
<td>83</td>
<td>99</td>
<td>52</td>
<td>22</td>
<td>3</td>
<td>12</td>
<td>271</td>
</tr>
<tr>
<td>Ayu</td>
<td>34</td>
<td>177</td>
<td>35</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>259</td>
</tr>
<tr>
<td>Grace</td>
<td>76</td>
<td>44</td>
<td>36</td>
<td>27</td>
<td>51</td>
<td>6</td>
<td>240</td>
</tr>
<tr>
<td>Chun</td>
<td>94</td>
<td>31</td>
<td>47</td>
<td>22</td>
<td>7</td>
<td>6</td>
<td>207</td>
</tr>
<tr>
<td>Manhoor</td>
<td>46</td>
<td>59</td>
<td>18</td>
<td>13</td>
<td>18</td>
<td>8</td>
<td>162</td>
</tr>
<tr>
<td>Grana</td>
<td>59</td>
<td>21</td>
<td>36</td>
<td>10</td>
<td>26</td>
<td>3</td>
<td>155</td>
</tr>
<tr>
<td>Daisy</td>
<td>17</td>
<td>86</td>
<td>23</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>135</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2009</td>
<td>2072</td>
<td>1326</td>
<td>1043</td>
<td>554</td>
<td>215</td>
<td>7219</td>
</tr>
</tbody>
</table>
Among the other participants, the main differences related to the amount of time spent on assignments compared with time spent on learning materials. Olivia, Divina, Ruby, Chun, and Grana spent a much higher proportion of their total online interactions on assignments than on learning materials, while Kya, Nanami, Fang, Ayu, and Daisy spent a higher proportion of their interactions on learning materials. In very broad terms, it might be feasible to suggest that the students spending more
time on assignment-related activity might be more motivated by extrinsic goals, while those spending more time on learning materials might be more motivated by intrinsic goals. Further, there were variations in the amount of activity relating to other online content such as the unit home page and unit information, although these types of interactions accounted for a small proportion of overall activity. It may be the case that students spending more time accessing these folders were exhibiting higher levels of metacognitive self-regulation in the areas of planning, monitoring, and regulation as set out in Pintrich’s (1991, 2004) model, though again this is just a tentative observation.

These results support the earlier findings that some but not all of the participants in the study demonstrated the ability to undertake self-regulated learning within the flipped learning unit. Some of the students exhibited very low levels of usage of the online learning materials that were intended to support self-regulated learning in this unit. This appears to correspond in broad terms with the self-reporting of less independent learning styles. The implications of these findings will be discussed in Chapter 6.

5.2.1.2 Skills and abilities

A second key factor influencing experiences of flipped learning is the range of skills and abilities of the learner. In particular, the findings revealed two main types of skills that appear to have an impact on the students’ experiences of self-regulated learning in this flipped learning environment.

First, the responses of several participants indicated that language skills are important, since these influence the learner’s ability to understand texts, the speed with which they can work, and the amount of support often needed. Seven of the participants for whom English is not their first language remarked on the difficulties
they face in learning independently, relating to difficulties in understanding material or the extra time it takes to read texts:

“The students with the mother language, which is English, maybe they can finish within one week. But for me after reading something I can’t understand I need to do research again and again.” (Chun, Interview 1)

“For me, readings do take a lot of time. I think I take three times as much as local students do.” (Nanami, Interview 1)

However, it was not just the students from a non-English speaking background who reported language-related difficulties; five of the local students who are primary English language speakers also reported that they struggle with reading and writing skills. In the following example quotes, the difficulties these students faced in completing assignments as a result of these challenges were clear.

“My writing lets me down a lot ... in how I write it. I can write English. Yes. But it lets me down a lot.” (Daisy, Interview 2)

“I am a slow reader, I think. So ... when I try to understand things, it actually takes a lot of time. So, if I have a huge amount of reading, it is going to take me a long time to read all that stuff and to really synthesise it, I guess.” (Olivia, Interview 2)

Second, the ability to manage and organise oneself effectively also came across in the qualitative findings as a general skill that is very important in contributing to a successful flipped learning experience, as well as being identified as one of the key components in Pintrich’s (1991; 2004) model of self-regulated learning. In Chapter 4, material regarding time management skills was presented as evidence of self-regulated learning abilities within the resource management dimension. In this chapter, the qualitative findings regarding time and self-management skills are discussed in terms of the ways in which differences in these influence individual
students overall experiences of self-regulated learning within the flipped learning environment.

Most of the students indicated that the overall workload they face is too heavy, especially taking into account their work on other units, demonstrating relatively little evidence of time management skills in self-regulating their workload. Overall, 16 of the participants commented on the difficulties of managing the workload from this and the other programs they were enrolled in.

“It’s just too much reading for one week. Every week has different readings and questions.” (Kya, Interview 1)

“I have been very stressed out because all the units this time are coming in ... they are all due the same week. Like, a couple days apart. I haven’t been able to catch up on the online work that well.” (Anh, Interview 1)

When asked in their interviews and learning logs to reflect on their performance in a recently completed assignment, as well as the flipped learning unit overall, seven of the participants specifically noted that they have poor time management abilities or a tendency to be distracted, and their accounts suggest that these traits may have affected their performance in the program. For example:

“I’ve always been a procrastinator. I always put things off to the last minute. I always ... It’s just something. I always, I’ll do everything else but that, and then all of sudden, I’ll be like, Oh, I’ve got to do that.” (Daisy, Interview 1)

“Because I am so unorganised normally. So, I usually don’t want to do the things I don’t want to. I just leave it for the last minute and save it up for one day or two days.” (Nanami, Interview 1)

These responses contrast with those reported in Chapter 4, which demonstrated the ways in which good time management is used by some of the participants to
support their self-regulated learning, for example by using systematic planning methods, allocating particular days for study, or doing a little work each day on an assignment instead of leaving it all to the last minute. For those experiencing difficulties with time management or organisational skills, it is clear from their accounts that these factors have a negative impact on their overall experience of the flipped learning unit. However, these also provide evidence of self-regulated learning in terms of the ability to recognise their areas of weakness and the need to work on these.

“I have learned that one of my many weaknesses is time management and organisation skills of online and class work.” (Anh, Learning Log 3)

“What I learned was that my organisational skills are terrible and I really need to fix that not just in Uni but in my life.” (Grace, Interview 1)

5.2.1.3 Levels of interest and motivation

The findings also indicated that their personal levels of motivation and interest in the program and its materials influenced the students’ overall experience of the flipped learning unit. In particular, participants who expressed a general dislike of the flipped learning model came across as poorly motivated and disinterested in learning. Overall, nine of the students reported struggling to stay motivated by the program.

At least in part, this seemed to be related to the structure of the flipped learning unit in that students who were not naturally independent learners reported needing the support of a tutor and classmates to feel motivated.

“For lectures, for example, you see the person, you’re able to ask the question and people are able to discuss. But then the online, it kind of did not allow me to do that, it didn’t motivate me, and I felt like I didn’t have the time to do it.” (Kya, Interview 1)
However, motivation was also influenced by the content of this particular unit, which several learners reported overlapped with work they had already completed in diploma courses.

“I don’t know why it’s not working for me. I think it’s just motivation in general, because I already feel like I know the unit and that doing it online and watching all the long videos, I've already seen them before.” (Xia, Interview 1)

“Sometimes the interest wasn’t there. I feel like—I came in here with my diploma, so I learned a lot of this about the theories, the play, and everything like that in the past extensively.” (Daisy, Interview 2)

This suggests that the levels of motivation necessary to promote self-regulated learning can be influenced by the selection of course content that is interesting and stimulating for the learners, a point that is discussed further in Chapter 6.

Some participants reported that the low levels of motivation and engagement of their peers, which resulted in low levels of participation and interaction in class, influenced their own motivation and enjoyment of the course.

“The few tutorials there were, seemed like only maybe one or two others had done their prior learning. Therefore, when it came to issues, discussions, questions for the tutorial, there was mostly a deathly silence. I felt like I was the only person in the class engaged in the tutorial and the learning. It was frustrating.” (Olivia, Learning Log 3)

“There are a few students who are actually participating in activities and did the reading etc..... Then the rest ... there’s just sitting because it’s not compulsory and it doesn’t go towards any marks at the end.” (Kya, Focus Group 4)
This finding demonstrates the importance of classroom-based learning time that includes constructive interaction with peers, when students are working independently and alone for a large proportion of the time—another issue that will be considered more fully in Chapter 6.

5.2.1.4 Time constraints and other commitments

Although the flipped learning model offers students the potential to combine study with other commitments, as discussed later in the chapter, the existence of these commitments and time constraints also has an impact on the ability of students to perform effectively in the unit. Eight of the participants reported ways in which family commitments, travel time, and jobs constrained the time available for study and placed uncomfortable pressure on them. For example:

“I live very far… traveling time is taking so much … considering traveling time and everything … and also the other days you have to work … so for me I don’t have enough … to finish all the readings” (Bulana, Focus Group 2)

“I think for me it’s particularly hard. Just because when I get home, you can’t really sit down and just do your assignment. You have to do other things and like your kids take up most of your time and you basically won’t be able to do anything until they are asleep. So basically all my assignments are done at night and in the mid hours of the mornings … There have been a lot of times that I’ve thought, I don’t know, that maybe I should just give up and go to work.” (Divina, Interview 1)

One student expressed the view that the flipped learning model does not take into account the types of personal commitments that students have, many of who are mature learners. The implication of the following quote is that the effectiveness of flipped learning relies on the students having suitable home environments for
independent study, and perhaps also that greater levels of support for students are necessary to help them study while coping with a wide range of competing responsibilities, a point which will be addressed further in Chapter 6.

“We’re not just uni students we have you know... we might have jobs ... we have families and everything to ... look after and take care ... and some might probably even have kids and all that ... so it’s like they’re not catering for everyone’s environments.” (Daisy, Focus Group 1)

The findings relating to the impact of individual student differences on the experience of flipped learning may have implications regarding the selection of students or the eligibility criteria for flipped learning programs, which will also be considered in Chapter 6. The following sections consider the findings relating to the ways in which factors relating to the design, content, and delivery of the flipped learning unit also influenced the self-regulated learning experiences of the students.

5.2.1.5 Familiarity with flipped learning

This subsection examines the evidence regarding changes over time in the students’ attitudes to flipped learning and in their self-regulated learning behaviours as they gained more experience of and familiarity with the flipped learning approach. This growth in familiarity with flipped learning has an important influence on the experiences of self-regulated learning among students, which are not static but evolve and change over time.

The impact of increased familiarity over time was examined in multiple ways in the qualitative research. In their initial interviews, the participants were asked if they had made changes over time in their learning strategies and, having completed the first assignment of the semester, to identify anything they would do differently when working on future assignments. In their second interviews, at the end of the semester, they were asked to identify anything they had learned about themselves as
a result of completing the unit, and also to reflect more generally on their experiences. The learning log data, compiled at three points during the semester, were also examined to identify any notable changes in the attitude or approach to flipped learning exhibited by individual participants. Evidence of various forms of self-regulated learning, as discussed in Chapter 4, could be seen in the ways in which some participants were adapting their learning strategies to the demands of the flipped learning unit, and also in the ability of many of the students to be self-critical or identify areas for improvement in their learning.

Five of the participants specifically reported that they had developed new learning strategies during the semester, in response to the demands of the flipped learning unit. In her first interview, Chun explained how during the semester she had started to write a paragraph on her assignment every day as a way of coping with her heavy workload and still keeping up with the assignment, providing a good example of the use of a time management strategy. Another student, Grana, reported a change in her methods for note-taking to improve the quality of her learning.

“The first semester I was on the iPad typing (but) I feel like if I hand write it I ... retain a lot more information. So I’ve decided to handwrite this semester.” (Grana, Interview 2)

Other participants had also modified their learning behaviours to help them cope with the demands of a heavy workload as well as their personal or work commitments, but this often involved prioritising their efforts to focus on those aspects of their studies that were perceived to be of less value. For example, in her second interview, Kya mentioned that she no longer completed the online work in the flipped learning unit, while Anh reported that she focused more on other units which she perceived to be “more important than this one” (Anh, Interview 1). These
types of behaviours were also identified and discussed in Chapter 4, in response to
decision-making about the perceived value of tasks.

Not all of the students reported making changes in their learning behaviours.
However, five specifically made the point that they were continuing with the same
approach to studying that they had always used, either because this was working
well for them or because they felt unable to change their ingrained learning style.

“It’s still pretty much the same. Just making sure I do it in the beginning of
the week and focusing on that, and then doing my other work.” (Elena,
Interview 1)

Although this may represent a rational approach to the finding that existing
learning strategies remain effective in the flipped learning context, an unwillingness
to adapt less effective strategies might be regarded as poor self-regulated learning.

“I already knew my learning style and ... I don’t think it’s ever gonna
change ... I can’t.” (Daisy, Interview 2)

In their interviews, focus group discussions, and learning logs, a considerable
number (N=13) of the participants identified things they could do better when
working on an assignment or to improve their own organisational skills or learning
abilities. This demonstrates quite a high level of self-regulated learning in the sense
of critical thinking and metacognitive self-regulation for many students. Several
made the observation that they needed to focus more on, and reflect on, their
learning, rather than rushing the work.

“I regretted skimming ... through the readings ... or not searching up for
things that I do not understand.” (Anh, Focus Group 3)

“I think I need to change my thinking first, not grab the idea from the essay
and the stack-up or the references. Do more self-reflection. That’s the most
important.” (Chun, Interview 1)
“If I had the chance to go back in time and do it again, I would put a little more effort into just the research, and then I would feel a lot better with what I had produced … I would have been able to do it in depth, rather than wasting a lot of time.” (Grace, Interview 1)

Two of the participants noted that they should have spent more time reviewing or editing their work before it was submitted.

“I’d give myself more time I think to actually write it, and actually read it, reread it … I reckon if I had more time and I actually did it and then reread it, I might have changed some stuff” (Daisy, Interview 1).

“I think mainly just putting more of an effort into it and editing it more than I would have before, because I don’t think I edited that essay. And just checking over it, over and over to make sure it sounds right, the grammar’s right, and I’ve got all my answers in right.” (Xia, Interview 1)

Bulana observed that, even though she often identifies ways in which to improve her learning strategies, in practice it can be difficult to implement these, a comment that seemed to be echoed in the experiences of other students who similarly complained about workload and time pressures.

“You think: I should do this more. I should do that more. But, then another assignment come and you will be repeating your old habits again.” (Bulana, Interview 1)

Overall, however, it seems evident from the participants’ comments that length of time in a flipped learning unit does have an impact on their ability to self-regulate their learning and, for some, the effectiveness of their learning strategies. This is also reflected in the interview and learning log comments of participants who identified specific achievements and improved abilities resulting from participation in the flipped learning unit, as well as weaknesses that they needed to work on.
Around five students reported these types of improvements, which included increased motivation, an enhanced sense of personal responsibility, improved independent learning abilities and research skills, and better time management.

“Some strengths that I obtained from this flipped classroom experience (are) self-motivation, self‐responsibility, and better use of finding resources online.” (Anh, Learning Log 3).

“I am able to time manage and allocate time to ensure that assessments are completed at least a day before assessment is due; I am able to multi-task; my research skills have improved.” (Ayu, Learning Log 3)

Those who identified areas for future development nominated the need to improve time management skills, to participate more in class, and to be better organised in general.

“It’s taught me a lot of how I need to do next semester … and how I need to address issues in (my) own life … So my time management skills are just so poor. I really need to address that so that’s definitely helped me with understanding that.” (Grace Interview 2)

“I’ve learned that I need to put myself into conversations through Uni, and that when there is conversation, I need to speak up, and I need to involve myself a bit more than what I have been.” (Grana, Interview 2)

Three participants (Anh, Stephanie, and Mahnoor) reported having prior experience of flipped learning before entering their current program. The focus group contributions and interview responses of two of these three participants, Anh and Stephanie, revealed that they demonstrate quite strong self-regulated learning abilities. It can be speculated that these might have developed at least in part from their previous experiences of flipped learning.
“I’m very independent, so I like finishing my work before heading to class.”
(Anh, Interview 2)

“[W]e had our last tute, and there was still a bit of time left before the assignment was due where we didn’t have the tute, so it was more like just doing it more independent, but it worked well. I still got everything done.”
(Stephanie, Focus Group 1)

However, the responses of Mahnoor did not demonstrate such a high level of self-regulated learning, indicating that prior experience of flipped learning alone is not sufficient to promote self-regulated learning abilities.

### 5.2.2 Program-related influences on self-regulated learning

The data revealed a number of ways in which the design, content, and delivery of the flipped learning unit influenced the experiences of participants and their ability to carry out self-regulated learning. As discussed in the following subsections, these include factors inherent to the flipped learning model per se, as well as characteristics of this specific program. Identification of this range of factors is important in demonstrating how flipped learning programs can be designed to promote and maximise the benefits of self-regulated learning.

#### 5.2.2.1 Program structure

The qualitative research data from the interviews and focus groups highlighted the importance of a good structure to a flipped learning unit, in which the various elements are well aligned. With regard to self-regulated learning, the responses indicated that program structure has an influence in particular on the ability of students to apply effective cognitive and metacognitive strategies such as elaboration, planning, and regulating. If they are able to see and understand how the off-site and classroom-based learning components are connected, this enables them
to make linkages between the material, reinforce their learning, and effectively plan their time.

In this particular unit, students attended fortnightly tutorials, and online content was delivered on a weekly basis. In other words, one week involved online study as well as face-to-face discussion with the tutor and peers, and the following week was self-taught online. Although eight of the participants were positive about some aspects of the unit, only four students indicated that they were very happy with the overall structure of the unit and thought the elements were well aligned. For example:

“So the first week online and then the second week face-to-face and I think both they blend together pretty well. Because the face-to-face one is 2 hours and that sort of makes up that miss of the first week. But I think it is managed quite well. I did not have any problems with that. And having that Monday off … the first week … the online one … it sort of gives me more time to do … that week’s work of the unit as well.” (Stephanie, Focus Group 1)

In contrast, almost a third (N=6) of the participants indicated a view that the structure is ineffective, arguing for example that there is too much independent learning without sufficient support, and not enough face-to-face instruction time. One participant expressed the view that this structure is not suitable given the high demands of the course:

“I think for a unit like this, especially if it’s the core of my degree I think it should be an in-class lectures type kind of thing. Especially with the content and expectations they have on the essay … I mean the assignments, I think they have extremely high standards for their marking criteria and I don’t
think that for this type of content that it should be a flipped learning kind of thing.” (Divina, Interview 1)

Some expressed the view that fortnightly classes are not sufficient, and that the instruction provided in these classes is not well aligned with the independent learning components.

“It doesn’t really link to what we are learning about ... we spent 15 or 20 minutes ... talking about the essay question ... and that was it ... and we don’t see her for two weeks.” (Ruby, Focus Group 6)

It was also found that at least five of the students had enrolled in the unit without being aware that it would be delivered on a flipped learning basis, or without fully understanding what this would mean. This had led to a certain amount of confusion about or disappointment with the unit, and may have affected the students’ self-regulated learning experiences since these students had expected to receive higher levels of traditional face-to-face instruction. The following quotes convey this sense of confusion, which may have had a negative impact on the ability of the students to effectively regulate their learning, at least initially.

“I was unsure of exactly what the flipped classroom was to begin with ... like did we do something and then have like a massive discussion like go through in class ... At first ... I was so confused ... I never got explained fully ... I know I didn’t know what I (was) meant to do” (Daisy, Focus Group 1).

“I thought it will be like any normal class ... some lectures you attend ... some readings online ... hey just go to the tutorial and you learn there ... that’s what I thought it would be like.” (Anh, Focus Group 3)

The sense of confusion conveyed in these responses also suggests that, when students are not prepared for the flipped learning structure of an educational
program, this also has a negative impact on the motivational strategies aspects of self-regulated learning, reducing their perceived levels of control over learning, as well as their self-efficacy. Overall, therefore, these findings demonstrate the importance not only of ensuring that a flipped learning program is well structured, but also that this structure is made clear to students before they enrol in the program.

5.2.2.2 Role of teachers

More than half (N=11) of all the participants emphasised the important role that teachers play in any learning situation, even within a flipped learning environment. The responses highlighted many ways in which teachers support self-regulated learning in a flipped learning environment, in both the motivational and learning strategies elements.

According to one comment, for example, teachers are especially important in motivating individuals to want to be self-regulated learners.

“If the teacher shows passion then I’ll show passion. If she’s interested in what everyone is saying in what we’re actually learning about, I’ll be interested in it. I’ll sit there and listen and I’ll actually pay attention to what she’s saying. A lot of it does come down to how it’s being taught.” (Daisy, Interview 2)

This response suggests that the attitude and behaviours of teachers may be instrumental in shaping the ways in which students approach their learning, including whether they choose to focus on intrinsic or extrinsic goals. Teachers may also play an important role in influencing the value that students place on tasks due to the ways in which they communicate this when explaining these tasks and their relevance to student goals and outcomes.

Another student stressed that there is a need for teachers to support and reinforce students’ independent learning, a role that she conceptualised in terms of a “guide”
rather than a traditional instructor. Her response indicates that, in the context of self-regulated learning, teachers may play an important role in helping students to reinforce their learning through rehearsal strategies, and to apply effective organisational strategies based on the identification of connections between different areas of the program.

“To reassure our learning before that have we done online and to check if we understand ... all the materials that we have learned ... and to reinforce it ... I don’t think the instructor should be fully responsible for our understanding ... the instructor role should be more like a guide to our learning.” (Anh, Focus Group 3)

Some indicated that the tutor in their flipped learning model is fulfilling this type of role by answering questions in tutorials and on the online discussion boards, showing that these aspects of the teacher’s role are important in providing the back-up support that students need when encountering challenges or difficulties in their independent learning. In total, 10 of the students were to some extent positive about the standard of instruction received.

“She does answer the questions and gives example as well ... it was very helpful ... because she gave us more time to talk about what we are struggling with ... because if there’s something we’re not learning ... we’re learning it again ... and that’s what’s supposed to be for the face-to-face ... so it’s actually good that we are we can talk about challenges and stuff we had at home ... and talk about it in class ... yeah.” (Anh, Focus Group 3)

“From my experience this week ... I can see that the teacher is doing what she’s supposed to be doing she is posting on views ... she is answering discussion boards ... she’s showing up to tutorials ... is there with her knowledge to share” (Gabriela, Focus Group 4).
However, 12 students were much more critical of the instruction that they are receiving, which they see as misaligned with their assignments and very disjointed. These students explained the ways in which they felt the classroom teaching failed to support their independent learning activities, and their responses demonstrated the ways in which this creates barriers to effective self-regulated learning. As in the overall structure of the course, as discussed above, several expressed concerns that the classroom instruction they received appeared disjointed and not well aligned with the flipped learning components of the unit, making it difficult for them to make connections between the material or understand assignment requirements. Again, this may have adverse impacts on a range of aspects of self-regulated learning, especially learning strategies such as organisation and planning, but also on motivational strategies such as self-efficacy and control of learning beliefs.

“*To me that class doesn’t really flow. Because I feel that the subject in the worksheet, we don’t really go in depth to it in doing the tutorials … I’ll give you an example, we are talking about theorists, and then in the tutorials of that week. We start talking about the assessment that we should be starting. And then all of a sudden we jump to… work placement. … it gets quite confusing*” (Ayu, Focus Group 1)

“*I feel like, if the online work was more talked about in class and focused on more, I think it would’ve helped me more with the assignment, and given me a more clearer understanding of exactly what they wanted.*” (Daisy, Interview 1)

The participants were also critical of the specific types of instruction presented in the classes, complaining for example that they learn nothing new, or that the instruction is too focused on assessments. This again highlights the important role of program design in contributing to motivation for learning, an issue that will be
examined further in Chapter 6. In particular, however, the following responses suggest that the quality and content of classroom teaching have an important impact on the ways in which students focus on intrinsic or extrinsic goals, and define task value. A lack of interesting classroom content, and an overemphasis by teachers on assignments rather than the intrinsic value of the material being taught, are likely to result in a focus on extrinsic rather than intrinsic goals.

“I know assessment it’s really important but also in a way they’re focusing too much on the assessment sort of brings us away from what they are also trying to teach us in the learning materials.” (Ayu, Focus Group 1)

“There is new no new learning ... I switch off lot during the tutorial because there is no new learning” (Ayu, Focus Group 1)

5.2.2.3 Unit content and materials

The qualitative findings revealed the importance in a flipped learning unit of having user-friendly, easy-to-access online materials that support independent, self-regulated learning. Within the sample, there was a mix of positive and negative comments about the standard of unit materials provided, which revealed the ways in which this factor contributes to the ability of learners to carry out self-regulated learning.

The following three quotes illustrate the ways in which various aspects of course resources have an impact on the students’ experiences of the unit and their ability to be self-regulated learners. These include, for example, how interesting the materials are, how helpful in guiding the learning process and how convenient to use in terms of the time requirement. The following responses, for example, demonstrated the perceived importance of content that not only retains the interest of the student but is also set out and structured in ways that enable them to organise and plan their learning effectively.
“I think all of the materials that are online are very interesting … like in this unit she has introduction video … and there is this presentation … and then you just go through the slides … and in each slide there is a hyperlink to the materials that is supposed to read … you read it and then answer the questions … and the questions are linked to the materials that you’re reading” (Fang, Focus Group 2)

“I think the layout of this unit … online is really simple to follow, so that helped a lot … if it that makes sense like it is explained really well. And all sort of little folders things that … sort of step-by-step instruction as well. So that helps a lot.” (Stephanie, Focus Group 1)

“When I first looked at them [overview videos] … it’s boring I don’t want to watch it … but when I watched it was short and it was pretty much like the main points of that topic… so I watched every week … because they’re short and straight to the point … it’s better than like the one hour lectures online … I can set … so five minutes is better than … yeah.” (Mahnoor, Focus Group 2)

Many of the participants, however, were of the view that the course materials are inadequate or difficult to use; overall, 16 of the participants were in some way critical of the materials and indicated that they hindered rather than helped them to learn. For some participants, this related to their weak language skills as discussed earlier. The following quote reveals how the perceived value of tasks, an important aspect of motivational self-regulated learning strategies, is adversely affected by the length and nature of some of the course content for one of the students.

“The readings are just too long … I just want to quickly to get it over done. … Some of them … like I don’t want to say pointless … but it is just … some
of them are too long ... some of them I don’t know I don’t see the point of it”

(Mahnoor, Focus Group 2)

Another student described how her lack of understanding of some of the reading had a negative impact on her elaboration skills, in terms of her ability to paraphrase and learn this content by applying preferred learning techniques to it.

“For me the reading they gave us it was too confusing. So I couldn’t really wrap my head around what the different classical theories was. Let alone that actually write it in my own words and in incorporate them to my observation style.” (Ayu, Focus Group 1)

Others expressed the view that the online resources were not adequate for the purpose of their assignments and that they were forced to find other materials. This suggests that despite the flipped learning model nature of the unit, many of the students expected to be provided with all the information necessary for their assignments, rather than doing independent research. It may reflect poor control of learning beliefs on the part of these students, as well as a lack of understanding of the independent learning requirements of this type of program.

“I think that there wasn’t enough information available, like that was on VUWS (platform hosting the unit webpage). Like, we needed to do a lot more research.” (Elena, Interview 1)

“I think when it comes to writing assignments, it’s more like the library things that’s good, but not the unit contents. I don’t think that was really helpful.” (Gabriela, Interview 1)

Six of the participants indicated that the flipped learning unit has insufficient practical relevance to their choice of career, and expressed a desire for a less academic approach to the course. Although this relates to the content of this particular unit, rather than the flipped learning model per se, it is important in
highlighting the ways in which the overall experience of students and their motivation for self-regulated learning is influenced by course content as well as delivery, a factor which must be taken into account when designing this type of program and which is explored further in Chapter 6.

“The stuff that I have learned so far ... I don’t think that I have applied to practical work yet ... the stuff we have learned ... the theories and stuff and all that ... they are really old-fashioned. And we don’t really need it now... [laughing] maybe more practical work I guess [it’s would be helpful]”
(Mahnoor, Focus Group 2)

“It’s not practical to what we have learned ... we don’t have to write essays teaching children ... we have to write observations ... Like we came here to do that ... that’s what’s we are going to do in our lives ... we’re disappointed ... ‘cause this should be the class we look forward to the most ... that’s the whole reason we are here ... Where not here where not to learn about the analytical reading and writing” (Grana, Focus Group 6)

5.2.2.4 Assessment methods

The methods and criteria for assessing assignments on the flipped learning model were also found to have an important influence on the participants’ overall experiences of the unit and, in particular, to impact their abilities to self-regulate learning through the processes of monitoring and regulation. The clarity of assessment methods and criteria are especially important in this respect, but also the extent to which participants believe that these are fair and appropriate for assessment of their work.

Just one participant explicitly expressed the view that the unit’s assessment methods and criteria are clear, and her comment below suggests that this enabled the
student to regulate her performance effectively in order to ensure that her work met the assessment criteria and the expectations of the instructors.

“There are things you need to do and if you go through that enough times you get a clear idea of what they want and they just, you just need to do what they want. You know what I mean? It’s quite simple in that way.” (Olivia, Interview 2)

In contrast, six of the students reported difficulties in understanding the assessment methods or criteria, which had an impact on their ability to work effectively towards their goals. There was little evidence from the second series of interviews of any increase in understanding or agreement with the approach to assessment among these participants, suggesting that it is not a lack of familiarity with this approach that underlies their reservations.

“It wasn’t really clear what they wanted in the assignments. ‘Cause I don’t think we ... Like, we spent a large amount of time in tutorials with the assignment, just for the assignment. But I don’t think it was as much ... They weren’t really giving us the right information, I felt. ‘Cause, like I said last time, they’ll go on a tangent.” (Ayu, Interview 1)

Strikingly, more than half of the participants (N=11) expressed the view that the assessment methods used in the unit are unfair, due to the perceived subjectivity involved in marking, or the inconsistencies with grading in other units within their degree program. This view appeared to have a very negative impact on their overall experience of the course, since they were not able to achieve the positive feedback and outcomes they expected from their work. However, these criticisms of the assessment methods and criteria do demonstrate that the students were thinking critically about the nature of the flipped learning unit, and also that they were aware
of the importance of clear and fair assessment criteria as a tool for monitoring and regulation of their own work.

“I think like, what annoys me the most is how like, subjective everything is. Like, everything is based on your teacher it’s not about your ability. So every teacher wants something different off you. So you just have to find out what your teacher wants and then write based on what they want. Because they will allocate their marks based on their feelings not what you think.” (Ruby, Interview 1)

“I always get like [high distictions] in my referencing for other units and it’s still like the same, the same ... so ... it’s the same as my other units, why am I getting discrepancies in my referencing?” (Divina, Interview 1)

The following two students demonstrate even more advanced forms of critical thinking by expressing the view that different forms of assessment should be used in this flipped learning unit and suggesting specific alternative approaches.

“I think we should be assessed on how play with children how we interact with children ... how we can adapt the theories ... that’s we have been taught ... which we are already know ... into the field ... that’s how only should be assessed ... we should be assessed on being able ... to talk about it and discuss it.” (Ruby, Focus Group 6)

“I would ask for a report besides the assignment. I would ask for something like ‘How did you do your work?’ You know, like maybe one page. ‘How did you do your work, step by step? What did you do?’—‘Okay, I did this and this and this and this.’ ‘How come you end up with this research question? Why? Why is that your interest?’” (Gabriela, Interview 2)

Clarity of assessment criteria and methods can be regarded as essential to the effectiveness of a flipped learning unit in promoting self-regulated learning.
Learners must be able to understand these criteria and use them in setting goals and monitoring their progress towards these. This is especially important given the low level of tutor contact and regular feedback on progress in this type of course. The illustrative quotes included in this section also demonstrate, though, that the students are able to critically reflect on the assessment criteria and identify ways in which they believe these should be modified, which itself reflects critical thinking, an important aspect of self-regulated learning.

5.2.2.5 Technological aspects of program delivery

Two of the participants stressed that to complete this kind of program it is crucial that individuals have access to appropriate IT; they questioned the suitability of the course for all students for this reason and the need to provide alternative methods of accessing course material.

“But is it practical for everyone ... like given the demographics ... someone might be living in somewhere where you don’t get enough Wi-Fi coverage.”
(Ayu, Focus Group 1)

“There should be another way to access it without ... so there’s something does go wrong ... say you don’t have connection does the maintenance ... goes down or something ... there is another way to do it that you still get it done when you want to get it done without ... this technology playing big part in it” (Daisy, Focus Group 1)

However, another recognised that the use of online learning in a flipped learning model is aligned with the needs and preferences of the younger generation, a comment which suggests that technology will play an increasingly important role in self-regulated learning:

“They’re targeting more our generation ... because everyone is just on their phones ... you know ... they are fast on their phones ... rather than writing...
notes for example ... they will be typing ... they’ll be texting ... For me ... I mostly use my iPad and laptop.” (Kya, Focus Group 4)

Some participants did report that they had experienced problems in using the flipped learning IT system, which had been a source of frustration for them but had not had a major negative impact on their work.

“I didn’t actually know there were videos until I saw the discussion board and people were talking about the videos ... so it’s just like a hyperlink and I was thinking it was just an article so I did not press on it ... and I just read it” (Ayu, Focus Group 1)

“They gave you a limited amount of ... like I do it all on my laptop ... and while I’m writing ... I jot down all my ideas ... but I don’t look at the screen ... so I’m writing it down ... and then I realised ... it doesn’t let me write anymore ... so everything I have written down ... it’s just gone ... that happens a lot to me” (Ayu, Focus Group 1)

This demonstrates the importance of providing reliable and user-friendly technology to support students’ self-regulated learning in a flipped learning model. The majority of learning on this type of program takes place online; students need to be able to access course content, assessment criteria, discussion boards, and other resources in order to effectively carry out many aspects of self-regulated learning such as planning, monitoring, and help seeking. This is considered further in Chapter 6.

5.3 Ways that Self-Regulated Learning is Developed or Shaped by the Flipped Learning Model

This section pulls together key themes and findings from those reported in this and the previous chapter to address the question of how self-regulated learning is shaped or developed by the flipped learning model (answering sub-research
question 3), and includes additional insights from the thematic analysis. The findings are categorised by the ways in which the flipped learning model fosters self-regulated learning and the ways in which it hinders self-regulated learning.

5.3.1 Ways that the flipped learning model fosters self-regulated learning

The analysis revealed three main ways in which the flipped learning environment fosters the use of self-regulated learning: promoting independent learning; improving engagement in learning; and providing improved flexibility in relation to time and students’ learning methods. These are discussed in turn in the following subsections.

5.3.1.1 Independent learning and critical thinking

Thirteen of the participants indicated that the flipped learning program provides them with the opportunity to learn and find out things for themselves through the online unit materials and other sources. Their comments revealed the various ways in which flipped learning can help promote independent learning and critical thinking. For example, when reflecting on her experiences of the unit in her second interview, Ayu explained how she had become much more proactive in seeking out different types of resources to use in her studies.

“It’s sort of made me more resourceful in stuff, in how I can approach different like information and stuff, like how I can finish assignments and all that. I used to never go to the library and take out books and stuff like that, but with this unit I found that I actually went to the library. I took out a book ... I did use other resources, not just the resources that I’m given. So I guess in that point it has made me sort of more resourceful in the way I approach work. And just trying to find different resources, like videos on the internet,
articles that I find that I could use maybe, so I guess that’s a good side of flipped learning.” (Ayu, Interview 2)

This quote from Ayu’s interview helps to reveal an important aspect of critical thinking: the ability to consider what types of information and resources might be useful for an assignment, rather than just relying on the information and links provided in the unit. This was conceptualised in Ayu’s quote in terms of being “more resourceful”. This skill was also reflected in Daisy’s experience of the unit, as follows:

“I think, knowing that I had to do my own research ... did sort of get me thinking about it. Especially when it came to assignments, I was thinking, you know, they wanted more than just one or two people, like books or something, so I had to actually look and read and stuff. So throughout, that helped me, because I knew they weren’t going to give it to me.” (Daisy, Interview 2)

Other students emphasised the ways in which the flipped learning unit had helped them become more autonomous, independent learners, because they were expected to be able to organise their own time and workload, and identify what needed to be done to complete the assignments and other work, without a great deal of support from their instructors. Stephanie, for example, found that critical thinking and autonomous learning went hand in hand in the flipped learning model:

“It’s sort of more active so not just sitting there listening ... You are ... reading a lot of things and then having [to] work out how to answer all the questions yourself.” (Stephanie, Focus Group 1)

Both Anh and Elena stressed the ways in which they had become more self-disciplined and organised while participating in the unit.
“Self-responsibility—It was up to me to control my own learning. It’s up to me to do the work and everything before class. Also my searching skills, for finding sources, have gotten a bit better.” (Anh, Interview 2)

“I felt like I had to be more on top of everything. Because there wasn’t someone always saying, you need this done by this day, and more independence as well. Like, there was a lot of independent work that I needed to do. But I think it makes a bigger difference disciplining. Like, the way that you have to learn all your subjects and everything.” (Elena, Interview 2)

Views on this differed between the participants though: two argued that flipped learning actually hindered their critical thinking because of the limited opportunities to find out about different views and perspectives in a classroom situation. Ayu, for example, explained that her approach to critical thinking involves listening to a variety of perspectives and interpreting these in the context of her existing knowledge, and argued that the limited face-to-face instructional time and peer contact in the flipped learning course is not conducive to this:

“That’s why I like social learning. Because you get different perspectives, different contexts on that particular situation. So using your knowledge you can judge for yourself if it’s good or bad … I need people to give me feedback on this stuff and then take on board what they say and then use my own like knowledge … So in a way that doesn’t help me learn as much as I can if I had more interaction.” (Ayu, Interview 2)

In a similar way, Daisy stressed the importance of hearing different perspectives on an argument in order to critically evaluate the relevant information and come to a conclusion. This student shared the view that the flipped learning unit does not provide sufficient interaction to support critical thinking.
“I know I’m not always right and I know that I don’t always have ... the answers to everything so it’s nice to hear what other people have to say and how ... someone might think something is right when I think it’s wrong and their argument might persuade me to think, well, maybe, you know, maybe I have to rethink about it.” (Daisy, Interview 2)

5.3.1.2 Engagement in learning

Six of the participants reported that they feel more engaged in their learning and feel that they learn more effectively in the flipped learning model. Their accounts provide important insights from a student perspective into what engagement in learning means in practice, for example defined in particular in terms of “deep learning”, a concept identified in the literature as being associated with more effective learning (e.g., Marton & Saljo, 1984).

“I think this is more deep learning ... because if you don’t have a clear understanding you’re not going to go far within the unit ... every week you have different information about the topics ... you actually have to read into it .... If you don’t understand it you have the textbook as well ... it gives you a clearer view of everything” (Elena, Focus Group 5)

As discussed earlier in the chapter, the need to engage more deeply in learning seems to be one of the key points that some students acknowledge as they became more familiar with the flipped learning approach. It was mentioned by several that, based on the experience of their first assignment, one of the things they would do differently in future would be to engage more in reading and learning, rather than just skimming text. They expected that this would result in a better assignment and improved grade. The potential role of flipped learning in stimulating deep learning will be considered more fully in Chapter 6.
Discussing why the structure of the flipped learning unit promotes greater engagement in learning, one of the students explained that, in contrast with a traditional classroom situation in which it is possible to listen but not really take in the information, when studying independently there is a tendency to focus and understand the material to a greater extent. Another referred to the fact that it is easier to gain an understanding of the reading because the student can spend time researching something they do not understand, which is seldom possible when learning with others in a classroom.

“The students they have to engage more than regular lectures ... I think you can go to the auditorium and sits in the back and you listen and listen and listen ... and you’re not really engaging ... but here you have to get your computer ... put it in the right week ... listen to or watch the videos ... read the text ... put your discussion in the board” (Gabriela, Focus Group 4)

“If I didn’t understand I search it up. Whereas in class if I don’t understand something I just sit there ... and be confused ... because in class I can’t search things up ... because we’re in class and we are learning about it and stuff ... so yeah ... so yeah it’s help my understanding a lot.” (Anh, Focus Group 3)

In her third learning log, Anh also noted that taking the time to research a topic at home enables a student to participate more effectively and engage better in subsequent classroom discussion about the topic.

5.3.1.3 Flexibility in place and time of learning

More than half of all the participants (N=11) emphasised the importance to them of the flexibility provided by the flipped learning model. Students have more control over their own learning environment, timing, and processes in this approach, enabling them to exercise the resource management aspects of self-regulated
learning. This is especially important to those participants who need to combine family or employment commitments with their studies, and the comments of students in this area indicate that flipped learning thus facilitates their ability to carry out the resource management aspect of self-regulated learning specifically in terms of managing their time and prioritising work.

“One way that I really loved it and it helped me is that I could do it when I wanted to do it and that was really important in terms of trying to fit my work in. So, it meant that, I could, you know, if I needed to get up at six o’clock in the morning and do three hours then, you know, um, and it works around my gigs and everything else that I had in my life and that’s a really good, great advantage.” (Olivia, Interview 2)

“I can fit a lot more in like ... I can work more hours and then go home and do uni instead having to come here for a lecture and do extra hours in class. It is a lot easier to learn by yourself.” (Stephanie, Focus Group 1)

An important aspect of self-regulated learning in this context is developing the capacity for autonomy and self-discipline that is required to take advantage of the flexibility offered by a flipped learning unit, while ensuring that they meet the assignment specifications and deadlines, as well as the other requirements of the unit. Several participants stressed the value to them of being able to decide when and where to work on different components of the unit, which enables them to manage their time better and to reinforce their learning by going over earlier material and using this for later assignments. This suggests that the flexibility afforded by flipped learning may contribute to self-regulated learning strategies such as planning, elaboration, and organisation.

“If you cannot do something ... the classes are there in the views ... so you can access any time .... When you come go back to lesson one and then go
back to lesson five as many time as you need …. I think there are positives .... most positives ...” (Gabriela, Focus Group 4)

“I don’t have to go to a lecture and sit down and listen to people. I can do one assignment while I am trying to also do this assignment. Like, you know what I am saying. Like, I can find resources while I am still thinking of answers for this question. Like, for this assignment.” (Ayu, Interview 2)

5.3.2 Ways that the flipped learning model hinders self-regulated learning

The findings also revealed a number of ways in which the flipped learning unit appeared to be hindering the participants’ ability to experience self-regulated learning. These consisted of timetabling and delivery issues, a lack of adequate support, and insufficient opportunities for collaboration and engagement with peers.

5.3.2.1 Follow-up on progress

Since this program is designed to have just one class every 2 weeks, several participants reported becoming confused about what would be covered, or forgetting when work needed to be completed by. Four participants expressed some degree of confusion which hindered their ability to effectively plan and complete their work on time.

“I’ll forget, ‘cause, one week’s online, the online week, I’ll sometimes forget what that week is about, so it’ll be hard, if... So if I forget that one, then I won’t be able to ask questions.” (Anh, Interview 2)

“At the beginning I was really confused, about how the, especially when, it wasn’t, when, what I was learning wasn’t followed up in the class, which, what I thought it was going to be, and I think it just sort of confused me a lot, and I was just like, well, I don’t really get how this works, then” (Daisy, Interview 2)
This structure also had a negative impact on the students’ motivation, since they were less inclined to complete work that would not be followed up in class, or would not be assessed. Overall, 15 participants reported that the structure of the unit had a negative impact on their motivation to complete work.

“As the class is fortnightly, I have found it more difficult to find time for the materials I need for class as it doesn’t seem as important if I don’t have it every week (even though it is). I have been able to submit things / learn the content a few days before it is due, I have just noticed as a learner I found this unit slipping to the back of my mind more than the other units I have that are weekly.” (Stephanie Learning Log 3)

“We do prepare … but only for the weeks we are going to meet … for the fourth week … for me I only look at the presentation … and not really doing the reading … I just skip skip skip to the next step.” (Bulana Focus Group 2)

5.3.2.2 Support and guidance

The development of effective independent learning skills also requires a certain amount of support and guidance, and for many of the participants this is a factor lacking in their flipped learning unit: overall, 15 students described ways in which the perceived lack of support and guidance from their tutor in the flipped learning unit hindered their learning or understanding of material.

Some of these were those students who had indicated that they prefer a more collaborative and supportive learning environment in general, and that the flipped learning model does not fit with their personal learning style.

“I have learned that it is really hard to find motivation in completing the work without that guidance from a tutor. I became independent when I completed the assessments. The unit didn’t help me with learning
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independence as I didn’t complete the allocated work as it didn’t relate to the assessments.” (Ruby, Learning Log 3)

“I was extremely independent in this unit. Not that I wanted to be that independent. I found that for an on-campus course, it was quite isolating.” (Olivia, Learning Log 3)

However, some of the participants who exhibited characteristics of independent learning, or who identified a preference for this learning style, also commented on the need for greater guidance or feedback from the unit instructors to reassure them that they were on the right track, or to clarify material that they were struggling to understand.

“I had no validation, no feedback on whether I’m getting things right or not.” (Oliva, Interview 2)

“Feedback, you know to feel the work that I done was actually considered. OK, considered bad or good, but considered.” (Gabriela, Interview 2)

Both Olivia and Ruby also pointed out that better integration of the online learning materials with the classroom instruction would provide enhanced scaffolding within the unit, which would help to promote more effective independent learning.

“Suggestions to make the learning more independent would be to get more engagement in the learning from other students and scaffolding the learning, so that the learning in the tutorials is directly related to the assignments and therefore the final mark.” (Olivia, Learning Log 3)

“It would have been of greater help if the online lessons were more focused on the main aspects of the topics so more student engagement could be noticed during the tutorials. If you are enrolled in a course it is expected to
have a tutor to help you clarify points or challenge you to further develop your thinking.” (Gabriela, Learning Log 3)

5.3.2.3 Engagement and collaboration with peers

Finally, many of the participants expressed the view that the flipped learning unit does not encourage the development of a collaborative learning atmosphere. It is not surprising that those participants who prefer a collaborative learning style expressed concern about the lack of opportunities for more peer learning. However, even for the more independent learners, the reported low levels of student engagement and participation in the classroom sessions were perceived to be a major factor influencing their overall experience of the unit and ability to learn effectively in it.

Based on the accounts of the participants, there appear to be two main factors contributing to this issue, which are directly related to the structure of the course and the fact that there is only one classroom session every 2 weeks. First, the students do not have enough regular interaction to develop the familiarity with one another that would contribute to more collaborative learning.

“I think familiarity with all the students, probably seeing them more, being able to communicate with them more besides the every two week kind of thing would be better. Just to open conversations, people get to know each other more and then be more comfortable to openly voice their opinions.”

(Divina, Interview 1)

Second, because the online learning material and classroom discussions were not well integrated, with many of the independent learning activities not followed up in the classroom, the students had little incentive to prepare in advance for the class and as a result many did not contribute to the classroom discussion. This in turn was discouraging for the small number of students, such as Olivia, who did report doing
the prior learning for the class and having expectations of a more productive discussion, which were not met.

“The most frustrating thing was (it) seemed like only maybe one or two others had done their prior learning. Therefore when it came to issues, discussions, questions for the tutorial, there was mostly a deathly silence.” (Olivia, Learning Log 3)

In her second interview, Olivia expanded on this point by suggesting that the course materials be better integrated and that more of the learning activities be assessed, in order to encourage greater participation by the other students.

“I would like them to be more interactive in the tutorial so that we can all learn together ... I think the lecturer or the person who organises the course needs to, if they’re gonna face the situation where people are only gonna do something when it’s assessed, they need to embed the assessment in the learning, the direct learning.” (Olivia, Interview 2)

These findings raise questions about the optimal ratio of online to classroom-based instruction in a flipped learning unit, as well as the nature of assessment—issues which are discussed in Chapter 6.

5.4 Chapter Summary

This chapter has set out the findings of the study in relation to sub-research questions 2 and 3, based on the qualitative findings from interviews and focus groups, and some quantitative information from the trace data showing student interactions with the online content.

The research has revealed a number of student-related and program-related factors that influence learners’ experiences of flipped learning, which have been documented in the chapter. In total, nine relevant factors were identified: four relate
to the characteristics and circumstances of individual students, and the remainder relate to the design and content of the flipped learning unit.

The four student-related factors found to influence self-regulated learning in the flipped learning unit consisted of: (a) individual learning styles and behaviours; (b) skills and abilities; (c) levels of interest and motivation; and (d) time constraints and other personal commitments.

The interview and focus group findings provided evidence that the students in this sample varied considerably in terms of their personal learning styles and preferences, and these in turn affected their experiences of self-regulated learning within the flipped learning model. In particular, from the interview and focus group findings a minority of students were identified who appear to be highly motivated self-learners and who expressed positive comments, in general, about the flipped learning unit. Those who claimed to be naturally independent learners or who welcome the opportunity to study at their own pace generally reported more positive views on the flipped learning unit and appeared to be more self-regulated learners who exhibited a range of the behaviours set out in Pintrich’s model. In contrast, many expressed dislike of the flipped learning model and indicated a preference for more collaborative, face-to-face learning. In general, these students also demonstrated weaker self-regulated learning skills, and often appeared to struggle to motivate themselves to work independently. On the whole, the quantitative results were aligned with the findings of the qualitative analysis, and indicated that there is considerable variation among the participants in terms of their learning activity.

The qualitative findings also revealed two main types of skills that appear to have an impact on the students’ experiences of self-regulated learning in this flipped learning environment: (a) English language skills, which influence the learner’s ability to understand texts, the speed with which they can work, and the amount of
support often needed; and (b) the extent to which a student is able to manage and organise herself effectively. The findings also indicated that the students’ personal levels of motivation and interest in the program and its materials influenced their overall experience of the flipped learning unit. In particular, participants who expressed a general dislike of the flipped learning model came across as poorly motivated and disinterested in learning. Another student-related factor identified as having an influence on the experience of self-regulated learning in the flipped learning unit consisted of time constraints and other personal commitments, such as being in paid employment or having children to take care of. The study revealed that, although flipped learning offers students the potential to combine study with other commitments, the existence of these commitments and time constraints also sometimes has an adverse impact on the ability of students to perform effectively on the program.

The qualitative findings of the study also revealed that students’ experiences of self-regulated learning are influenced by a number of program-related factors. In particular, five program-related factors were identified: (a) program structure, such as the ratio of classroom-based and independent learning; (b) the quality of teaching, and specifically the ways in which teachers support self-regulated learning; (c) the type and quality of learning materials provided; (d) the assessment methods used and whether these are perceived by the students to be fair; and (e) technological aspects of program delivery. All of these factors were found to have an impact on the ways in which students were able to demonstrate self-regulated learning abilities or were hindered from doing so, particularly in terms of motivation and learning strategies such as organisation, planning, elaboration, and monitoring.

Finally, the integrated findings from this and the previous chapter have demonstrated the main ways in which self-regulated learning appears to be
developed or shaped by the flipped learning model, which were categorised by the ways in which the flipped learning model *fosters* self-regulated learning and the ways in which it *hinders* self-regulated learning. Three main ways in which the flipped learning environment appears to foster the use of self-regulated learning were identified: (a) promoting independent learning; (b) improving engagement in learning; and (c) providing improved flexibility in relation to time and students’ learning methods. Three ways in which the flipped learning unit appeared to be hindering the participants’ ability to experience self-regulated learning were also identified: (a) timetabling and delivery issues; (b) a lack of adequate support; and (c) insufficient opportunities for collaboration and engagement with peers.

Overall, the findings reported in this chapter have demonstrated the significant potential of flipped learning for supporting self-regulated learning among higher education students; they have also highlighted the ways in which personal and program-related factors have an important influence on whether effective self-regulated learning can be achieved. As a result, these findings are invaluable in identifying what needs to be done to achieve best practice in future flipped learning programs. This will be discussed in the following chapter, which will also examine the implications and wider significance of the study.
6 DISCUSSION I: EXAMINATION OF THE FINDINGS

6.1 Introduction

The flipped learning model has been gaining greater attention in higher education in recent years (Hao, 2016; Rahman et al., 2014). This arguably reflects the ascendancy of student-centred, active learning pedagogy facilitated by the use of technology. The flipped learning approach represents a major paradigm shift in university education, and one that requires new types of skills on the part of both students and teachers. Since students are required to learn independently for a large proportion of the time (as traditional lectures are replaced by the online delivery of material that students study at home), the ability to self-regulate their learning is especially important in a flipped learning environment, and is essential to achieving the intended learning outcomes of a unit of study. In order to deploy self-regulated learning strategies, students need a set of “key skill” prerequisites, such as the ability to reflect on one’s own motivation to learn and to regulate that motivation, to plan one’s time and effort efficiently, and to be aware of the contextual factors that
can have an impact on learning (Azevedo, 2009; Balapumi et al., 2016; Butzler, 2016; Pintrich, 2004).

This study used Pintrich’s (1991, 2004) self-regulated learning model (based on Bandura’s (1991) social cognitive theory) as a conceptual framework for the purpose of investigating evidence of self-regulated learning in the flipped learning environment. In order to address the under-explored question of how self-regulated learning occurs in a flipped learning environment and the effectiveness of the flipped learning approach in promoting self-regulated learning (Abeysekera & Dawson, 2014), the present study has investigated by largely qualitative means (focus groups, in-depth interviews, and self-completed learning logs) the self-regulated learning experiences of a sample of undergraduate and master’s students taking a flipped learning unit in the second year of a pre-service teaching degree in an Australian university.

The use of Pintrich’s model as a conceptual and analytic framework for the study also enabled the exploration of the extent to which a classic theory of self-regulated learning continues to be useful for examining learning processes in a technology-facilitated flipped learning context. Most of the leading models of self-regulated learning were developed at a time when face-to-face classroom-based teaching and textual sources were the main vehicles by which information was transmitted to students. Nowadays, much of this information is transmitted electronically in a variety of formats, and many forms of distance learning are being adopted, such as the flipped learning model. There is a need to understand whether classic models of self-regulated learning are still relevant and helpful for the analysis of learning in these new contexts, and whether modifications to these theories or new models of self-regulated learning are needed. Although this is not a primary focus of the current study, the methods and theoretical framework used
mean that the study and its findings help contribute to an understanding of the continuing relevance of Pintrich’s self-regulated learning model in today’s educational environment.

The purpose of this chapter is to interpret the findings of the study in the context of the theories and other literature discussed in Chapter 2, highlighting the ways in which they support, build on, or conflict with the existing literature, and exploring in particular the theoretical implications of the results. This analysis and interpretation of the research results is presented in the following sections, organised by the main themes of the study. First, I discuss the results regarding the main components of self-regulated learning, as defined in Pintrich’s model, focusing on their implications for the design of flipped learning programs and the ways in which these implications relate to other research and theory in this area. Second, I examine the findings regarding the factors influencing experiences of self-regulated learning in this environment, and discuss their meaning and how they relate to or build on existing literature. Throughout these sections, I discuss the ways in which the findings were as expected or unanticipated and consider the likely reasons for any unexpected results. Based on the analysis and interpretation of the research findings, recommendations for the design of flipped learning programs to support self-regulated learning and for future research in this area are then presented. Following this, the limitations of the study are identified and their implications are considered. The concluding section of the chapter summarises the key findings of the study and comments on the overall theoretical significance of the research.
6.2 Review and Discussion of Findings

6.2.1 Realigning education: Self-regulated learning in a flipped learning environment

Although the effectiveness of a flipped learning approach relies heavily on the ability of students to regulate their own learning, to date very little research has been conducted into how self-regulated learning actually occurs in the flipped learning environment (Abeysekera & Dawson, 2014). Sub-research question 1—What forms of self-regulated learning are demonstrated by students in the flipped learning model?—was therefore intended to address the relative paucity of research in this area. This is important for understanding how flipped learning programs should be designed to optimise the self-regulated learning process, and how self-regulated learning processes differ between individuals in such a context. This research is also important in order to further the understanding of self-regulated learning and to develop and refine self-regulated learning theories so that they better reflect the emerging technology-facilitated learning environment.

Pintrich’s (1991, 2004) self-regulated learning theory and accompanying measurement tool, the MSLQ, were used as a conceptual and analytical framework, as discussed in Chapter 3. These were particularly helpful for the purpose of identifying examples of self-regulated learning from research data, since they include detailed descriptions of effective self-regulated learning within two major elements (motivational strategies and learning strategies) and a number of different components and items, which were used for the purpose of identifying relevant behaviours from the interview and focus group transcripts and the learning logs.

6.2.1.1 Motivational strategies

The first main element of Pintrich’s model consists of the motivation scale, comprising three value components, two expectancy components, and an affective
component. Motivational strategies are also important components of other classic theories of self-regulated learning (e.g., Borkowski, 1996; Zimmerman, 2000), suggesting that this dimension is especially important in understanding the effectiveness of self-regulated learning. However, the systematic review conducted for the current study found little evidence of research into the motivational or affective factors influencing students’ self-regulated learning in flipped learning environments (Balapumi et al., 2016).

In relation to the first two value components— intrinsic and extrinsic goal motivation—most of the participants in this study were able to identify and articulate their goals, and many made statements that indicated they were motivated by a combination of extrinsic and intrinsic goals. However, the extent to which these goals had been clearly identified by students prior to participation in the study is not entirely clear. Extrinsic goals mentioned by some of the students—such as facilitating a change of career or improving job opportunities in the area being studied—seem to have been well formed prior to enrolling in the unit. On the other hand, intrinsic goals—such as an inherent interest in the content of the unit—were more difficult to assign to students prior to enrolment. It is possible that intrinsic goals are endogenous to participation in the unit; that is, intrinsic goals could develop or be realised due to participation in the unit, rather than pre-dating participation. This provides an important insight into the ways that learners may set goals and suggests the potential for influencing these goals through the design of flipped learning programs in ways that are not fully captured by Pintrich’s model.

It also emerged from the research data that many of the participants had enrolled in the unit with little or no awareness that it would include flipped learning, or with little understanding of what flipped learning entails in practice. Ideally, students engaged in self-regulated learning will set their goals in relation to the nature of the
learning process based on the structure and teaching methods to be used in the unit. If this was not properly understood, at least some of the students may have had unrealistic goals—that is, goals that did not fit well with the nature of the unit—which may have subsequently resulted in negative experiences of the unit (Butzler, 2016; Sankey & Hunt, 2014). For example, a number of students appeared to expected that the unit would be more classroom based and interactive in its content delivery, and based on this they envisaged being able to achieve similar types of learning goals as they had in their previous studies (e.g., at TAFE). Several of these participants reported a sense of dissatisfaction with the flipped learning model and appeared to be struggling to meet their goals. Again, this finding helps to build on the theoretical model by demonstrating the importance of “informed” goal setting based on a full understanding and awareness of a learning approach or task. It might also help to explain why the research participants’ overall experiences of flipped learning were more mixed that those reported by other studies in which the participants held generally positive views of flipped learning (Chen et al., 2014; O’Flaherty & Phillips, 2015; Zainuddin & Halili, 2016).

This finding also contributes to an understanding of how learners’ conceptualise task value—another aspect of the goal-setting component of Pintrich’s model. Very little attention has been paid in previous studies to examining the concept of “task value” in self-regulated learning: as reported in Chapter 2, only one previous study measured this variable (Van Vliet et al., 2015). In the present study, there was clear evidence of the concept of task value in the ways that some of the participants conceptualised their goals. It was found that, having assessed the value of learning tasks, students then modified their effort or approach to learning based on this. However, for a number of the participants, this had a negative impact on their engagement with the flipped learning unit, since students often decided that the
assessments represented low value in relation to their goals (Hulleman, Durik, Schweigert, & Harackiewicz, 2008; Joo, Lim, & Kim, 2013). For example, if tasks were not being assessed, the students put in less effort, particularly when facing heavy workloads and needing to prioritise their available time. Because much independent learning on the part of students was not followed up in class or formally assessed in some way, some students decided that spending time on such learning was of little value.

The second main component of the motivational strategies element of Pintrich’s model relates to the learner’s belief that they have control over their own learning and its outcomes. This expectancy component of Pintrich’s model includes two items: (a) the belief that a learner’s ability to achieve their goals depends only on their own efforts; and (b) self-efficacy, consisting of performance expectations and self-appraisal of one’s ability to complete a task. Although many previous studies have investigated self-efficacy in relation to flipped learning and demonstrated positive relationships between these factors (Hao, 2016; C. Lai & Hwang, 2016; C. Lai, 2015; Van Vliet et al., 2015), only two studies examined in Chapter 2’s systematic review investigated the role of control of learning beliefs (C. Lai & Hwang, 2016; Van Vliet et al., 2015).

In the current study, only some of the research participants expressed the belief that they have a high level of control over the outcomes of their work. The responses of others indicated that they perceived themselves to have low levels of control over their learning outcomes due to the impact of “external” factors such as “subjective” or inconsistent assessment methods. However, some students interpreted these factors as challenges to be navigated in order to achieve their goals, as opposed to inherent obstacles, which suggests that control of learning beliefs may be more complex in practice than the model suggests (Lili, 2013). The findings of
this study show that self-regulated learners can acknowledge that external factors, as well as their own efforts, influence their learning outcomes, and that they can modify their behaviour in order to account for these factors. For example, students who perceived “subjective” assessment tasks to be a challenge to be overcome felt that they could “tailor” their answers to suit particular assessors’ preferences. In contrast, less self-regulated learners were more likely to view these external factors as an insurmountable barrier to achieving their goals. This suggests that, if an assessment task does indeed possess “subjective” aspects, students should be reassured that their mark will not be affected by the personal views of the assessor, and made aware that it actually depends on making a well-supported argument, regardless of the conclusion reached. This will help ensure that highly self-regulated students are encouraged to develop their own views rather than “gaming” the system, while those with weaker self-regulation skills will be reassured that they will be judged using objective criteria.

Previous studies on self-efficacy in the context of self-regulated learning and flipped learning have mainly focused on ways of developing self-efficacy in students (Hao, 2016; C. Lai & Hwang, 2016; C. Lai, 2015; Tawfik & Lilly, 2015). The results of the present study indicated that, although most students held expectations about their performance and perceptions of their own self-efficacy, there was again a split between two main categories of learners. Around half of the sample held high performance expectations and generally believed that they had the skills and expertise to achieve these; the other half expressed lower performance expectations and lower levels of perceived self-efficacy. Those with lower expectations often explained their expectations in terms of a lack of particular skills and abilities, such as English language skills or writing abilities. Some, however, specifically articulated their perceived weaknesses in terms of lacking the types of
skills needed to succeed in a flipped learning environment, explaining that they have poor reading abilities or need face-to-face instruction. By contrast, more self-regulated learners appeared to acknowledge that it was not just their existing skills, but also the effort they were prepared to put into a task that would increase their self-efficacy and raise their performance (Kitsantas, 2013; Yeo & Tan, 2012). Those who were not self-regulated learners tended to reduce their expectations to reflect their perceived abilities, or to make excuses relating to the nature of the unit (Cody & Teachman, 2010). The expectancy component of the model was found to provide a useful framework for understanding these attitudes and resulting behaviours, and the findings reveal the ways in which the various items within this component are interrelated. There was also evidence from the research results that the performance expectations or the self-efficacy levels of some of the learners changed over time, becoming higher or lower to reflect their experiences of the unit or the grades received. This finding is closely aligned with Hendricks's (2014), in which the self-regulation process is conceptualised to begin with the use of lower cognitive skills level, and to invoke positive motivational states as it evolves over time. Interpreted in terms of this model, the findings of the present study may reflect an increase in self-regulated learning among the participants as they progressed through the flipped learning unit, receiving feedback and modifying their own learning behaviours to reflect this. They also demonstrate that these aspects of self-regulated learning are dynamic and changing, and can therefore be influenced by design factors and the feedback that students receive for their efforts. This is well supported by theories of self-regulated learning as well as the findings of empirical studies in this area (Bandura, 2006; Bannert, Reimann, & Sonnenberg, 2014; Monique Boekaerts & Corno, 2005; Cleary, Callan, & Zimmerman, 2012; Dweck, 1999; Karabenick & Zusho, 2015; Webster & Hadwin, 2015). For example, Dweck (1999)
found evidence that external feedback has an influence on how students feel about themselves and the ways in which they learn.

The largely self-reinforcing dynamic pattern of expectations and self-regulated learning could be due to the learners’ existing epistemological beliefs about their abilities. (“Epistemological beliefs” here means the beliefs that students hold about the nature of their own knowledge-producing capacities.) For example, some students may hold the belief that academic performance is largely a matter of effort, whereas others may believe that their performance is in some sense predetermined by their innate abilities and knowledge limitations. The literature indicates that students who believe that their intelligence or academic abilities are genetically determined tend to perform less well, are less likely to use a constructive process to regulate their learning, have lower levels of motivation, and are less likely to use appropriate learning strategies than those who believe that their intelligence or academic abilities can be influenced by their own efforts (A. Elliot & Dweck, 2005; Koksal & Yaman, 2012). This is also in line with previous studies (e.g., Otting, Zwaal, Tempelaar, & Gijselaers, 2010) which found that students who believe that learning and personal effort are interrelated tend to have a social constructivist view of learning and regard self-directed learning as important.

If at the beginning of the unit, therefore, students can be convinced that it is possible to develop new skills and abilities through practice, this might contribute to their ability to become more effective self-regulated learners. This, of course, depends crucially on the degree to which the epistemological beliefs of the students are themselves malleable. Howard, McGee, Schwartz, and Purcell (2000) and Brownlee (2001) argue that if students’ epistemological beliefs about learning derive from their own constructivist and relativist views, it may be possible to modify these through interventions. Others have pointed to the role of less malleable
social factors, such as parental education (Orgun & Karaoz, 2014; Schommer, 1990), or the role of gender in certain cultural contexts (Demir, 2005), which have a more constraining impact on the epistemological beliefs of tertiary education students.

The final component of the motivational strategies element of the model consists of test anxiety, which in this study was defined as assessment anxiety to reflect the nature of the evaluation methods used in the case study setting. Only two previous studies had investigated test anxiety among students in a flipped learning classroom, both of which used quantitative methods (Lai, 2015; Van Vliet et al., 2015).

By contrast, the present study explored students’ experiences of assessment anxiety in qualitative terms. It was found that around half of the participants reported experiencing feelings of anxiety or stress, specifically in response to workload pressures, an assessment submission deadline, or when waiting for work to be marked. In Pintrich’s model, test anxiety is included as a variable that is believed to have negative impacts on expectancies and academic performance. This conforms to previous empirical findings about the correlation between test anxiety and test performance (e.g., Chapell et al., 2005; Farooqi, Ghani, & Spielberger, 2012; Mamasseh, 2013; Rezazadeh & Tavakoli, 2009).

Although this study provided some evidence of this in participants’ descriptions of their difficulties in coping with workloads and submitting work on time, it also generated some contrasting evidence, at least in qualitative terms, that assessment anxiety can be an important motivator needed by some learners in order to focus on and complete their assignments. One possible interpretation of this finding is as follows. Those students who are mainly intrinsically motivated, or inherently interested in learning content for its own sake, may perceive assessment anxiety in negative terms (Sideridis, 2008), as a moment of potential invalidation of their
capabilities or even their self-identities as learners; but those who are extrinsically motivated may need the “prod” of assessment anxiety to compel them to study, something they may not have done otherwise because they have little intrinsic interest in the content (Cerasoli, Nicklin, & Ford, 2014). On the face of it, this hypothesis is not well supported by previous empirical findings, which have suggested that students who are intrinsically motivated tend to suffer less from test anxiety (e.g., Khalaila, 2015; McEwan & Goldenberg, 1999; Radi, 2013).

On the other hand, there is not yet a comprehensive body of research comparing intrinsic with extrinsic motivation effects across a wide range of disciplines for various kinds of assessed tasks—the focus has been on time-constrained final examinations, rather than essays and assignments. It is possible that when a strict time constraint is removed from a task assessment, and when students are allowed to work on assessments “in their own time”, as is the case for most flipped learning tasks, test anxiety might act as a positive motivator for embarking on tasks that would otherwise be the subject of procrastination.

This adds a new angle to much of the existing self-regulated learning literature (Bidjerano & Dai, 2007; Dickhäuser, Buch, & Dickhäuser, 2011; Khalaila, 2015; Ning & Downing, 2015; Sideridis, 2008; Van Nguyen, Laohasiriwong, Saengsuwan, Thinkhamrop, & Wright, 2015) which has highlighted negative relationships between test anxiety and academic performance in various groups of learners, by indicating that in the absence of other “controls” over learning in a flipped learning setting, test or assessment anxiety might for some learners have positive impacts. This hypothesis might usefully be explored using quantitative research methods in future, to provide greater understanding of this potential role of test anxiety in the flipped learning setting.
6.2.1.2 Learning strategies

The second main element of Pintrich’s (2004) model consists of learning strategies. This dimension includes the cognitive and metacognitive strategies of rehearsal, elaboration, organisation, and critical thinking; and the resource management strategies of time and study environment, effort regulation, peer learning and help seeking.

Critical thinking and metacognitive self-regulation have been the focus of many previous studies in this area (e.g., Butzler, 2016; Hao, 2016; Sletten, 2015; Van Vliet et al., 2015; Yong, Levy, & Lape, 2015), but most have investigated these aspects of self-regulated learning in quantitative terms, using Pintrich’s MSLQ (e.g., Sletten, 2015; Talbert, 2015; Van Vliet et al., 2015; Yong et al., 2015). The use of qualitative methods provides an opportunity to identify learning behaviours that correspond closely with these MSLQ variables, providing greater insights into the actual practices of students in these areas but without pre-defining the specific behaviours.

As might be expected in a flipped learning unit, there was very little evidence among the learners in this study of the lower level strategy of rehearsal, which involves memorising basic information. The unit was designed mainly for the development of higher-order thinking strategies that can help students navigate independently in the learning environment. Nonetheless, the rehearsal component of self-regulated learning has been shown to be important in other learning contexts for reinforcing learning. Interestingly, several participants in this study stressed the value of the online quizzes that test learning at the end of each module. Given the relatively low levels of direct classroom instruction in this flipped learning unit, together with the lack of assessment or feedback, and the impact that this has on perceived task value, these findings indicate that there may be a need to build in...
more ways of reinforcing learning and providing more immediate feedback (Koo et al., 2016; Sun et al., 2017). Students may value different types of feedback at different stages of their work, for example to ensure they are on the right track before submitting an assignment, or to learn how to do better on future assignments. This is supported by previous empirical findings (Butler, 2006; Cromley, Perez, & Kaplan, 2016; Hao, 2016; Kopcha et al., 2015; Pekrun, Cusack, Murayama, Elliot, & Thomas, 2014; Strayer, 2012). For example, Butler (2006) found that temporal feedback on how skills might be improved encouraged students to adopt mastery goals, which in turn improved their overall performance, while Pekrun et al. (2014) found that the anticipation of feedback by students prompted them to develop achievement goals. The reasons for needing this feedback are likely to vary, however, across individuals and contexts (Fryer & Elliot, 2007; Linnenbrink, 2005). For example, students who are motivated by high academic achievement may be likely to adopt performance goals, and thus demand normative feedback (A. Elliot & Church, 1997). It may also be the case that extrinsically motivated students may need feedback (both mastery and performance based) to ensure that their overall marks meet the required threshold, while intrinsically motivated students may be more concerned to have validation of their understanding of content. There is at present little research relating to this hypothesis, especially in the context of flipped learning. In any case, these types of considerations will have implications for the type and format of feedback provided to students in a flipped learning unit.

The elaboration component of Pintrich’s self-regulated learning model covers the strategies that learners use to help build internal connections between aspects of learning, including linking new information with existing knowledge. The results revealed considerable evidence of prior knowledge activation among the learners in this study, suggesting that the flipped learning environment may be helping to
promote this aspect of self-regulated learning. This was often expressed as a deliberate strategy for saving time or providing a basic knowledge on which to build, such as when the students reported using resources they had available from a previous academic course for their current assignments. Among the students who demonstrated more self-regulated learning skills in general, elaboration strategies often involved the creative use of diverse resources such as YouTube videos and other online content. The flipped learning environment clearly allows more flexibility and scope to utilise these types of resources than a more structured traditional learning environment, and some students appeared to be taking advantage of this by using sources that were aligned with their skills and preferred learning styles.

For a number of students who exhibited lower levels of self-regulated learning abilities overall, there was some evidence that the use of knowledge and resources already available to them from a less advanced academic unit may have hindered rather than promoted their learning, as in the case of several participants who were using college-level material for university assignments. This finding is somewhat puzzling, because it has been well established in empirical research that there is a positive relationship between prior knowledge and student performance in a wide variety of disciplines (e.g., Murphy & Alexander, 2002). It is possible that this form of elaboration may not necessarily enhance self-regulated learning but might be a means by which some students, when required to learn independently, may draw on their existing knowledge as the “easy option” rather than one that involves greater effort to identify a range of new relevant resources. However, it might alternatively be the case that the anomalous finding in the present study is indicative of high confidence (or faith) in the prior knowledge students have acquired, which renders them more committed to that knowledge and therefore resistant to, or ignorant of,
the need for the acquisition of new knowledge, especially if this does not cohere with their existing ideas (Dole & Sinatra, 1998; Maria, 1998; Pintrich, Marx, & Boyle, 1993). This indicates that effective elaboration strategies, at the very least, depend on having a good understanding of the requirements and performance standards required, and the ability to identify and utilise the right types and level of resources to fit this purpose—not just drawing on those that are convenient and familiar. It also suggests, however, that instructors may need to develop innovative methods of breaking down misconceptions about the validity of prior knowledge acquired at a lower level of academic study. It has been found, for example, that “traditional” methods of instruction, such as reading expository texts, have little impact in changing students’ misconceptions about what they “need” to know, and may even be a barrier to new knowledge acquisition (Guzzetti, 2000; Guzzetti, Snyder, Glass, & Gamas, 1993; van Loon, de Bruin, van Gog, & van Merriënboer, 2013). Instead, the use of conceptual change-based instructional interventions that specifically target students’ misconceptions has been suggested as a more effective strategy (Duit, Treagust, & Widodo, 2008). Within a flipped learning context, this may involve assigning “refuting texts” (Diakidoy, Mouskounti, & Ioannides, 2011) intended to challenge more simplified versions of theories that students may have previously learned, and for subsequent use in critical discussion and debate in a face-to-face classroom context, or in online discussion boards. This would actively foster development of the elaboration component of Pintrich’s self-regulated learning model, engaging in critical thinking.

In terms of the organisational component of Pintrich’s learning strategies element, the research participants’ interviews, focus group discussions, and learning logs revealed evidence of the use of a variety of strategies for organising information. Most students were using quite basic strategies, such as note-taking and
summarising texts—strategies which are aligned with Pintrich’s description of this area of self-regulated learning and which indicate that at least some degree of self-regulated learning was being exhibited by the majority of the participants in this area. A few participants, however, reported the use of more complex and quite personalised strategies, such as detailed diaries or the use of mind-maps for organising their ideas. These demonstrated a high level of self-regulated learning in that these had been developed to meet the specific organisational and learning needs of these individual learners. This is perhaps unsurprising given that these particular students exhibited performance goal mastery orientation and high levels of motivation. Previous research has shown strong links between these variables and the development of organisational strategies (Cerasoli & Ford, 2014; Colquitt & Simmering, 1998; Payne, Youngcourt, & Beaubien, 2007).

There was also evidence that the online organisational tools provided for the students’ use, such as the learning guide and assignment examples, were under-utilised. This raises questions about whether these specific tools were unhelpful to the students, or whether the low levels of usage resulted from a lack of awareness or understanding about how to use them, especially among students with lower levels of self-regulated learning skills. Anecdotal evidence from the unit instructors suggests that students often ask questions that could be answered by reading the learning guide, suggesting that the guide was not being read, despite it containing useful information. This highlights a shortcoming in the effectiveness of the materials in promoting or enhancing self-regulated learning. Paradoxically, the students who might arguably benefit most from the use of these tools to enhance self-regulated learning were the ones who did not access the tools precisely because they lacked basic self-regulation skills. The important point to note here is that instructors should not presume that students will, as a matter of course, avail
themselves of essential unit information—especially those students who have little experience of online learning. In a “traditional” face-to-face learning environment, this problem can be largely circumvented by working through, and constantly referring back to, learning guides and assignment examples in the classroom. An experimental study by Azevedo and Cromley (2004), for example, showed a significant impact even from the use of a short (30-minute) training “intervention” in which students were introduced to specific self-regulatory strategies, including organisational study strategies. Students in the intervention group were found to engage in note-taking, summarising, and coordinating informational sources, in contrast to those in the control group who tended to only engage in basic informational searches. In an online environment, similar interventions in early face-to-face interactions, and emphasised repeatedly via online “announcements” and videos, could function in a similar way.

The final item within the cognitive and metacognitive strategies component of the learning strategies element of Pintrich’s model consists of critical thinking—a crucial self-regulated learning skill that involves applying existing knowledge to learning, in order to solve problems, evaluate information, or reach conclusions. This aspect of self-regulated learning has been extensively studied in other contexts, but little is known about its use in the flipped learning context. The findings of this study revealed considerable evidence of critical thinking by around half of the students. It was these students who emerged as being more self-regulated learners in relation to many of the components of Pintrich’s model. Some of these learners specifically observed that the nature of the flipped learning unit helped them to think more critically by reading and learning independently. However, a number of participants who reported preferring a more traditional approach to learning argued that flipped learning hindered critical thinking for them. These students indicated
that they found it difficult to critically consider information without being in a classroom environment and hearing the views and perspectives of other learners—something that one participant referred to as “social learning”. These findings are aligned with previous studies that have identified an association between learning styles and critical thinking (e.g., Colucciello, 1999; Ghazivakili et al., 2014). They indicate that critical thinking is not an automatic outcome of a flipped learning environment, because personal characteristics such as personality and learning styles also have an influence on critical thinking abilities. When designing flipped learning units, therefore, there is a need to consider the critical thinking processes involved in different learning styles and take measures to ensure that critical thinking is promoted among all learners in the unit in ways that take account of their learning styles.

The next aspect of the learning strategies element in Pintrich's (2004) framework is defined as metacognitive regulation, which is broken down in the model into three separate components: planning, monitoring, and regulating. Most previous studies of flipped learning have addressed this mainly in terms of the scaffolding measures being used to support metacognitive regulation, such as guided note-taking, guided self-reflection and self-assessment, the use of online learning management systems, course portfolio development, progress tracking, and constant feedback (Butzler, 2016; Hao, 2016; Sletten, 2015; Van Vliet et al., 2015; Yong et al., 2015). The present study was able to identify the types of metacognitive regulation strategies and tools developed by the students themselves, highlighting the differences between participants in their use of these. Evidence from the qualitative data, as well as analysis of the trace data, indicated that although some participants displayed evidence of planning, monitoring, and regulating their learning activities, other students apparently were encountering difficulties in independently planning,
monitoring, and regulating their own work. This emphasises the importance of ensuring that students enrolled in a flipped learning model either possess the skills and abilities necessary for this important aspect of self-regulated learning, or are provided at the outset with the support or training needed to develop them.

More than half of the participants did report using a specific method for planning their assignments as well as the semester’s work as a whole, and some reported the use of quite complex, systematic approaches such as breaking down assignments into detailed tasks and timetabling them. For some, the unit learning guide and the assessment criteria were reported to be useful tools for planning, monitoring progress against these plans, and regulating performance as necessary by making changes to their work. Around a third of the sample, however, were apparently not using the online tools for planning and provided little evidence of systematically planning their work. Instead, it appeared that this group of students tended to formulate only short-term plans in a reactive manner in response to assignment deadlines. This demonstrates the need to ensure that these types of resources are well designed to support metacognitive self-regulation among learners in a flipped learning environment, and that students are made aware of how to use them in this way (Sun et al., 2017).

Overall, these findings demonstrate that metacognitive regulation (planning, monitoring, and regulating) is not a naturally occurring phenomenon. For students who have already developed metacognitive regulative skills elsewhere, there are few problems, but for those who have not developed such skills, simply operating in a flipped learning environment does not seem to significantly facilitate their development. Again, it would appear that students require direct instruction and advice on the development of metacognitive regulative skills at the start of a unit—
ideally by face-to-face exemplars—which can then be built upon by personal experience as the unit progresses.

Resource management strategies comprise the third main component of the learning strategies element of Pintrich’s (1991, 2004) self-regulated learning model. This component addresses the ways in which a learner must manage his or her time and study environment, as well as his or her own learning effort, and utilise peer learning and help-seeking strategies. Again, previous studies have investigated this quantitatively by using the MSLQ survey and pre- and post-intervention techniques (Sletten, 2015; Talbert, 2015; Van Vliet et al., 2015; Yong et al., 2015). Again, there has been little qualitative exploration of this area of self-regulated learning. The present study revealed considerable evidence of the use of time management strategies by most of the participants, and this aspect of self-regulated learning appeared to be particularly important for these learners, most of whom were facing heavy workloads and other personal or work-related constraints on their available study time. In the flipped learning model, students must replace the time structure of traditional classroom-based learning with more personalised approaches to time management. For those who did this successfully, flipped learning can offer an ideal solution to the challenge of juggling responsibilities and commitments, since it provides more flexibility in study times. This was highlighted in the accounts of a number of participants who reported setting aside particular days for studying, or doing so at night. An example of a self-regulated learning strategy for completing assignments when facing severe constraints on their time, reported by several of the participants, was working on a paragraph or a certain number of words each day until an assignment was completed. Even when participants described working on assignments close to the deadline, this was sometimes explained as a time
management strategy that was effective for the individuals concerned, since they were self-aware about needing the pressure of a deadline to get work completed.

Similarly, on the whole, the sample demonstrated a high level of awareness of the importance of having a suitable study environment, and several described specific conditions they need to achieve an optimal study environment as well as highlighting ways in which they regulate their own learning efforts, such as moving to a distraction-free environment when needed to improve their focus, or taking a break when needing to focus more or when feeling overwhelmed. The variety of conditions mentioned demonstrated that the ideal type of study environment is very personal to each individual, and that a self-regulated learner is one who recognises what this consists of for them. This also demonstrates that a non-face-to-face teaching environment is not always the best option, since some students recognised that they engage in learning more effectively in a more social setting, while a small number of other students stated that it was difficult to find “quiet time” at home. This finding raises questions about whether flipped learning programs should ensure that this is accommodated, perhaps by ensuring that students have access to study facilities in the university library at all times.

The findings also raise questions about whether a “one size fits all” learning environment in the classroom-based component of a flipped learning course is always appropriate, or whether a variety of face-to-face instructional options should be available to accommodate the needs of different learners. There is no definitive answer to this question, as the ideal scenario will vary depending on the nature of a flipped learning unit and the objectives of the classroom-based component. The research findings do highlight the importance, however, of acknowledging the needs of students with different learning styles and considering this issue when designing such units. Although the idea of acknowledging individual differences in learning
styles is not a new one (Algozzine & Anderson, 2007; Fryer & Elliot, 2007; García-Ros & Pérez-González, 2011; Griess & Keat, 2014; Linnenbrink, 2005; Milman, 2015; Siegle, 2014; Tulbure, 2011), one of the “selling points” of flipped learning has been that it increases the opportunities for individual styles of learning suitable to the “digital age” (Lage et al., 2000; Oblinger, Oblinger, & Lippincott, 2005; Philip, 2007). It seems to be presumed by proponents of flipped learning that, when students are carrying out a large proportion of their learning online at home, they are able to cover the unit’s content at their own pace, and in their own learning style. In this sense, “one size fits all” might be regarded as shorthand for “greater freedom for all”. The findings of the present study suggest that this view is overly simplistic and problematic. Students who are not equipped to deal with studying alone, or who personally dislike what they perceive as “isolation”, may struggle both academically and psychologically in such an environment. This could be countered to some extent within the context of a flipped learning model by having more online group interactions, for example in the form of chat rooms and webinars. This, however, requires further thought. Although the suggested approach might represent an important iteration of the flipped learning model for “distance learning” students, for those students who are located close to physical campuses there is a sense that this approach may merely be reintroducing a traditional face-to-face mode of delivery in a covert way, thereby undermining the original intent of the flipped learning model.

The weakest evidence of self-regulated learning defined in terms of Pintrich’s (1991, 2004) model related to the peer learning and help-seeking aspects of the resource management element. This contrasted with the findings of previous studies, which had revealed positive impacts of flipped learning on help seeking (e.g.,
Kopcha et al., 2015; C. Lai & Hwang, 2016; Sun & Wu, 2016) and peer learning (Van Vliet et al., 2015).

Based on the research results, it seems that the case study’s flipped learning environment did not effectively promote or facilitate the use of these types of learning strategies which Pintrich (2004) argued can have positive impacts on learning. Since peer learning involves collaboration or dialogue with other learners, it can be more difficult to utilise this strategy when students are studying content in isolation at home much of the time. In this unit, steps were taken to encourage interaction among the students via the online discussion boards, but the trace data as well as the qualitative research findings indicated that there was a very low level of usage of these by the students. This may be explained by the findings of research by Hew (2015) with undergraduate, postgraduate diploma students, and practising professionals in training settings. Hew (2015) found that the majority of students preferred instructor-facilitated online discussions rather than those facilitated by peers, because the former tended to keep discussions “on track”, helped with conflict resolution in discussions, provided authority when new content was introduced, and also motivated the students more. Hew and Cheung (2012) also found that text-based discussion forums were not well liked by students because of the difficulties associated with explaining difficult concepts in text form alone and the problem of being misunderstood in the absence of verbal cues. By contrast, Gašević, Adesope, Joksimović, and Kovanović (2015) found that when students lead online discussions, rather than instructors, deep learning can be achieved. They argued that “discussions with a high level of cognitive presence could be organized without a high involvement of instructors into the discussions” (p. 53) and that this could be “accomplished through externally induced motivation, externally-facilitated regulation scaffolds, and role scripting and assignment” (p. 62). The key
determinants here were, first, that discussion topics should be “meaningful” to the students themselves (not just to the instructors) so that students felt ownership over the learning process; and second, as Zha and Ottendorfer (2011) suggest, that students needed to be taught how to lead and develop discussions online in an inclusive and collegial manner (i.e., it should not be presumed that students will already know how to conduct open and fruitful discussions). This could be done, as suggested, by scaffolds and role scripting, but also by modelling an instructor (Cho & Kim, 2013; Su, Bonk, Magjuka, Liu, & Lee, 2005).

In the case study under consideration, online discussions were text based and largely peer directed—factors which may help to explain the low participation rates. If online discussion boards were monitored and facilitated more closely by an instructor, it is possible that students would find them to be a more useful tool for interaction with peers. Hew and Cheung (2012) found that online (asynchronous) voice discussion (as opposed to text-based discussion) was another useful way of avoiding the perceived limitations of online discussion forums. This type of innovation may be a way of improving participation in online discussions among the participants in the present study. It should be noted, however, that online discussions (whether text or voice based) have not been compared to synchronous face-to-face discussions in order to examine the relative impacts on student satisfaction and performance.

Further, it might be expected that a flipped learning model will result in a greater need for help to overcome difficulties such as comprehending complex concepts and solving difficult problems when individual resources are ineffective (Mahasneh, Sowan, & Nassar, 2012). Yet the participants in this study did not express a wide range of help-seeking strategies. It is possible that the limited amount of help-seeking behaviour among these participants reflects a number of perceived barriers
affecting both the online and face-to-face contexts of learning. For example, it might be the case that some of the students are “semi-autonomous learners” who interpret help seeking as an undesirable dependence on an outside source, which they would seek to avoid in order to maintain their sense of autonomy (Butler & Neuman, 1995; Deci & Ryan, 1985). Others might actively avoid help seeking if they perceive that others might perceive this as a sign of ignorance or incompetence, and a threat to their self-worth and/or social status (Karabenick, 2003, 2004; Ryan, Gheen, & Midgley, 1998; Tanaka, Murakami, Okuno, & Yamauchi, 2002). It should be noted that the interviews conducted with the participants in this study did not indicate, however, that these types of factors were explanations of the low levels of help seeking among the research participants. Instead, two other relevant issues emerged from the interviews and focus group interviews. First, a number of participants made the point that the infrequent face-to-face interaction between students in the unit hindered the development of the familiarity necessary to encourage peer learning. It is also possible, however, that at present students lack the self-reliance strategies necessary to autonomously build an online learning community which could facilitate peer learning, despite the fact that the technical infrastructure (especially discussion boards in Blackboard) is already available to them. Second, some of the students mentioned that when they used the online system to seek help from unit teachers, there had been delays in response that had delayed their work. However, since very few students posted questions on the discussion board, it is difficult to tell the extent to which the latter point was a valid factor influencing the overall use of help-seeking behaviour among this group of students. However, similar findings have been generated by previous mixed-methods studies, which reported evidence of flipped learning unit participants’ dissatisfaction with factors including the lack of opportunities to ask real-time
questions during lectures and receive adequate feedback during class time (Yong et al., 2015), as well as the poor quality of online group discussions (Hao, 2016). These are all problems that might be addressed through the redesign of a unit to include more opportunities or more effective methods for interaction between students, and by an improved speed of response by instructors to questions posted online. Further, the difficulties that participants identified may also be symptomatic of a lack of self-regulatory strategies or a lack of confidence in developing autonomy with respect to their own learning. It may be that some participants, despite the changed learning environment, retain a traditional conception of pedagogy in which they are the passive recipients of knowledge from an authority figure. When this is not forthcoming, they lack the strategies to adapt or perhaps even to recognise that adaptation is required. This in turn is manifested as dissatisfaction with the flipped learning model which they see as the cause of their difficulties.

More generally, the participants in the present study did report some help-seeking strategies involving relatives, friends, and library support staff, thereby demonstrating their abilities to self-regulate learning using this approach even though it was not used extensively. The extant literature on academic help seeking, especially as it relates to blended and flipped learning models, does not address this kind of behaviour, so it is an area requiring further exploration; but one may speculate that students turn to these “outside” sources of help as a substitute for face-to-face help, which may in turn suggest that help-seeking support provided by the university did not meet the needs of students. On the other hand, it is not unreasonable to expect that, in a flipped learning unit where content is mainly delivered in a home environment, students will naturally turn to those people to whom they have immediate access, such as family and friends.
6.2.1.3 Section summary

Overall, it can be concluded in relation to sub-research question 1 that most forms of self-regulated learning are demonstrated by the cohort of participants as a whole; however, there are considerable differences between individual learners in their ability to utilise self-regulated learning strategies. Based on the conceptual and analytical framework of Pintrich’s self-regulated learning model, in broad terms, it was found that roughly half of the participants demonstrated high levels of self-regulated learning in relation to the majority of the items, however, the remainder demonstrated much lower levels of self-regulated learning. This indicates that the use of flipped learning per se does not necessarily result in self-regulated learning, and that it might be important to design flipped learning models in ways that specifically promote or facilitate self-regulated learning among all learners.

6.2.2 Causes and consequences: Factors influencing self-regulated learning in a flipped learning context

In what follows, the research findings are discussed in relation to sub-research questions 2 and 3. This sheds further light on how self-regulated learning might be promoted in the flipped learning context by examining the impact of specific individual-related and program-related factors on experiences of self-regulated learning and the ways in which the flipped learning environment promotes as well as hinders the use of self-regulated learning.

As discussed in the previous section, the participants in this study were found to have quite different types of experiences of the flipped learning model, with some demonstrating fairly high levels of self-regulated learning abilities, and others apparently having lower levels of self-regulated learning skills. In very broad terms, it appeared that slightly less than half the sample fell into the first category, and reported more positive overall experiences of the flipped learning unit, while the
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A remainder (a slight majority) fell into the second category and reported less positive experiences.

Answering sub-research question 2—**What are the possible factors that influence students’ self-regulated learning in the flipped learning environment?**—required more detailed investigation of the factors that have an influence on the ability of students to demonstrate self-regulated learning in a flipped learning environment, and also required an exploration of how self-regulated learning is developed or shaped by this environment. It is important to understand these issues in order to provide a better understanding of the role that the flipped learning model can potentially play in self-regulated learning in the context of higher education. Such an understanding is also important for designing flipped learning programs in ways that maximise the likelihood that self-regulated learning will occur. The focus group and interview transcripts as well as the student learning logs were therefore analysed to identify the main influences on self-regulated learning among the sample of learners in this flipped learning unit, and to explore their general experiences of the flipped learning environment to determine how this promotes or hinders the use of self-regulated learning.

A total of nine factors were identified from the data that appear to have had a substantial impact on the students’ experiences of self-regulated learning in this environment, and which were broadly categorised as personal factors and program-related factors. This is in line with the theory of Zimmerman (1989), who argued that personal factors are not the only influences on self-regulated learning, but rather, personal factors are influenced by and interact with external environmental factors. It also reflects Bandura’s (1991) argument that human functioning is “regulated by an interplay of self-generated and external sources of influence” (p. 249). As reflected in the theories of Zimmerman (1989) and Pintrich (2004), an
important aspect of self-regulated learning is the ability to manage the external environment; however, the findings relating to sub-research question 1 of this study demonstrate that some students have lower levels of self-regulated learning skills and in order to develop these they may require more support in terms of program structure, content, and delivery.

6.2.2.1 Personal factors

The main personal factor influencing experiences of self-regulated learning in this flipped learning environment appeared to be the personal learning styles of students. Proponents of flipped learning claim that one of the benefits of this approach is that it appeals to a range of learning styles, since learners are relatively free of the constraints often imposed in face-to-face learning contexts (Lage et al., 2000). However, the findings of this study revealed that certain types of learning styles appear to be associated with more positive experiences of flipped learning than others.

Around a third of the sample claimed to be independent learners or those who enjoyed being able to study at their own pace in a flipped learning context, and these comprised most of those who also demonstrated more self-regulated learning skills. In contrast, more than half of the sample indicated that flipped learning was not well suited to their personal learning style, and expressed a preference for more traditional, classroom-based methods of learning. A number of the students who indicated that they were not naturally independent learners came across as unmotivated, and some specifically reported that they needed the support of a tutor and classmates to improve their motivation levels. Further, analysis of the quantitative trace data on patterns of use of the online learning system provided support for this broad categorisation of the learners. This data also supported the finding that a minority of students, given their online unit activity, were
considerably more proactive learners. These findings, however, do not necessarily prove that those students who are less independent learners are not well suited to the flipped learning model. Although most of these students (that is, less independent learners) expressed a preference for traditional teaching methods, they also indicated that they had not been aware that their current unit would be taught on a flipped learning basis, and had not been prepared, it seems, for this form of learning. It is entirely possible that if these students had been primed and more fully prepared for a flipped learning model, they may have been more amenable to it. That is to say, rather than assuming that each student has a single, pre-set and unchanging personal learning style, it is possible that individual students may be capable of developing different learning styles suitable to different environmental models over time. If, however, such learning style flexibility has not already been developed in a student—because, say, they have only had to use a single style in the past—then they will be ill prepared for a new kind of learning environment (such as a flipped learning unit). For individuals who have little prior experience of studying independently, it would thus be important not only to ensure they understand in advance what will be required of them in a flipped learning program, but also to ensure that they receive some initial training in self-study methods as well as adequate support throughout the program to help them adapt to this approach or overcome specific difficulties. It is thus possible that students who profess having a less independent learning style may even develop a preference for this as they become more familiar with the approach.

Specific types of skills and abilities, in particular language-related skills and time management and organisational skills, were also found to have a powerful influence on the students’ experiences of self-regulated learning in a flipped learning environment.
With respect to academic language proficiency, English was not the first language of some of the participants. Similar to experiences reported in the literature (e.g., Zhang & Kenny, 2010), these students reported difficulties when learning independently since it often took them a long time to read and understand academic texts. However, poor reading or writing skills were also reported as presenting similar difficulties for some of the native English speaking students too.

This finding raises questions about whether there should perhaps be eligibility criteria for flipped learning programs that include minimum standards for academic reading and writing in English, in order to exclude those students who might struggle with the independent learning requirements of the unit and would be better suited to a traditional learning environment in which more support is provided. Alternatively, it suggests that there is a need to accommodate the needs of such students who are accepted into a flipped learning unit, in ways that might include, for example, providing more time for students of a non-English language background to complete assignments or ensuring that help is available for editing of their work. The participants in this study reported that the university library provided editing services for students, but the few who had used these services reported unhelpful experiences, either because the editors were unable to assist within the available time or because the students were dissatisfied with the standard of the assistance provided. Certainly, the provision of readily-available high-quality editing services will be an important way of overcoming the difficulties caused by weak language skills for some students in a flipped learning program and supporting their self-regulated learning. Alternatively, designers of flipped learning units might reconsider the types of academic activities assigned to the students to ensure that these are well aligned with the language reading and writing abilities of all students; this might include, for example, more user-friendly texts which are presented in less
advanced academic language with text or quizzes designed for self-testing and reinforcing learning (Fleck, 2012).

*Self-management/time management* was another category of skills found to be influential in contributing to a successful flipped learning experience. This is unsurprising given the heavy requirement for independent learning in this approach. It is also an important aspect of self-regulated learning as conceptualised in Pintrich’s (1991, 2004) model. Around a third of the participants in this sample noted that they had poor time management abilities or a tendency to be distracted, which suggests that these traits may have affected their performance in the program. On the other hand, the more self-regulated learners had generally developed strong time management strategies and appear to have had more positive experiences of flipped learning. The differences within the sample are aligned with the finding of Talbert (2014) that students who struggle with time management tend to be disadvantaged when confronted with outside-class activities.

Notwithstanding that some individuals may naturally have stronger time management and organisational skills, these are both areas that can be improved through training and experience. Given their importance in a flipped learning environment where students are required to manage their own time and workload to a high degree, it seems sensible for universities introducing such programs to offer time management and organisational skills training to students at the outset of the unit, and even to make these a compulsory unit requirement.

Another personal factor found to have an influence on experiences of the flipped learning program is the *time constraints and other commitments* that students have in their lives. Proponents of flipped learning often argue that one of its benefits is the ability to combine study with a variety of lifestyles (e.g., Waha & Davis, 2014). However, although the flipped learning model offers students the potential to
combine study with other commitments, it was found that having many personal or work-related commitments, or a heavy study workload overall, has a negative influence on the experiences of some students, especially those with lower levels of self-regulated learning abilities. This reflects the findings of a number of earlier studies (Blaschke & Hase, 2015; Butcher & Rose-Adams, 2015; Darolia, 2014; Lehmann, 2012; Logan, Hughes, & Logan, 2015). Just under half of all participants in the sample reported ways in which family commitments, travel time, or paid employment constrained the time available for study and placed uncomfortable pressure on them. Some of these students are also mature learners who have been out of the educational environment for some time and may lack confidence in their own study skills. Although flipped learning can help increase access to education for a wide range of learners, these findings also suggest that it may be important to consider the personal circumstances of students when determining eligibility for a flipped learning unit, or at least to ensure that applicants understand the independent learning requirements of the unit and can make an informed decision about their own suitability for this type of unit. Furthermore, since many students now undertake part-time employment while studying, the stereotypical image of the full-time student with no other demands on their time is becoming outdated. Paradoxically, offering more flexibility in study time may actually mean that other life commitments encroach more on the “free” time of students. For some, participation in a more traditional, highly structured unit requiring regular on-site attendance may make it easier for them to organise their time and commit to the requirements of the unit.

Finally, differences in the overall familiarity of learners with flipped learning—as already referred to several times in this chapter—was also found to have an impact on experiences of self-regulated learning in this unit. This finding not only
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reflects students’ reported perceptions of this approach to learning, but the ways in which these perceptions changed over time as they became more familiar with it. This is aligned with the findings of previous qualitative research by Tawfik and Lilly (2015) that students’ initial trepidation about the subject matter decreased as their self-efficacy improved throughout the semester, and may be explained at least in part by Abeysekera and Dawson’s (2014) model of flipped learning, which showed how this approach can have a positive impact on both extrinsic and intrinsic motivation levels and can improve a learner’s ability to manage his or her “cognitive load” over time.

In the present study, there was evidence of emerging forms of self-regulated learning in, for example, the ways in which some participants adapted their learning strategies over time to meet the demands of the flipped learning unit, and also in the ability of many of the students to be self-critical or identify areas for improvement in their learning as they progressed through the unit. This process could be expedited, with concomitant positive impacts on self-regulated learning, by making sure that participants in a flipped learning unit have a good understanding of the requirements for independent learning at the outset, and are equipped with the skills needed to meet these requirements.

6.2.2.2 Program-related factors

The research findings also revealed four particular ways in which the design, delivery, and content of the flipped learning unit influenced the experiences of participants and their ability to carry out self-regulated learning. The finding that personal and environmental factors had interrelated influences on self-regulated learning among this sample provides validation in this context for Zimmerman’s (2000) model of self-regulated learning which emphasised the distinct yet interdependent role of personal, behavioural, and environmental influences,
something which was addressed only to a limited extent in the resource management element of Pintrich’s (1991, 2004) model of self-regulated learning. This demonstrates the importance of examining self-regulated learning within a specific context, and demonstrates the specific value of the case study approach adopted in the present study. However, while some of the identified design-related factors relate to this particular flipped learning unit, and indicate ways in which this might be modified in order to support self-regulated learning more effectively, others relate to the more general design and delivery of flipped learning programs and can be used to identify more generic recommendations for maximising self-regulated learning within the flipped learning model.

One of the factors relating to flipped learning in general concerns the ratio of independent learning to classroom-based learning. There is strong evidence from the qualitative findings of this study that students found that having only fortnightly classroom sessions was insufficient. The majority also reported that they found this structure confusing, forgetting when the classes would be held and what material would be followed up; they also indicated that the lack of more regular face-to-face instruction and peer interaction had negative impacts on their motivation. Only a minority of four students expressed a high level of satisfaction with this unit structure. Again, these findings suggest that increasing the ratio of classroom-based learning to independent learning, along with providing more feedback, might have a positive impact on self-regulated learning, particularly with respect to motivation levels and engagement in learning. Previous researchers have argued that all three of the main learning phases of a flipped learning model—the pre-class phase (content attainment), the in-class phase (content application), and the reflection phase (content evaluation) (Jensen et al., 2015)—need a high level of self-regulated learning strategies and the necessary support for these strategies to develop.
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(Betihas et al., 2016; Butzler, 2016; Chen et al., 2014; Hao & Lee, 2016; C. Lai & Hwang, 2016). The present study reinforces these assertions by revealing that participants need adequate follow-up and support in order to promote the use of self-regulated learning.

It is also important, however, to ensure that the training and support provided by instructors are of a high standard. The role of teachers in flipped learning was the second program-related factor identified as having an influence on self-regulated learning. Although the role of teachers in flipped learning is more concerned with facilitating learning than providing direct instruction, teachers still play an important role in ensuring that students understand the unit content and assessment requirements, and in providing constructive feedback on students’ work. Many previous researchers have emphasised the important role of the instructor and the types of support they provide to students in the flipped learning environment. As King (1993) argued, for example, the effective use of class time in flipped learning should involve the construction of meaningful knowledge, rather than the mere transmission of information. Andrews, Leonard, Colgrove, and Kalinowski (2011) describe this as active learning, in that students work on questions or tasks designed to help them understand a concept—a process that is facilitated by the flipped learning model. McLaughlin et al. (2014) also highlighted the importance of the teacher’s role in promoting active learning that enhances students’ learning outcomes and improves their motivation and attitudes. A potentially useful way of addressing and enhancing the flipped learning tutor’s role was highlighted by Green (2015) who recommended the use of scaffolding measures, including supporting resources as well as assistance, to enable students to bridge the learning distance between what is known and what is unfamiliar in terms of course content. Another important consideration which helps retain the basic principle of the flipped learning
model was provided by Lage et al. (2000), who emphasised that instructors in this setting should focus on the desired outcomes and provide the necessary resources and support to enable these to be achieved, while allowing students to select the best method for them personally to use in reaching those outcomes.

In the unit used in the present study, the intended *purpose of the classroom sessions* was to follow up some of the independent learning modules and to answer students’ questions about the material they had engaged with outside the classroom. However, more than half of the participants expressed dissatisfaction with the classroom sessions, indicating that they were not perceived as a valuable use of their time or were not well aligned with their independent learning. These findings contrast with those of M. Kim et al. (2014) who found high levels of student satisfaction with teaching in a flipped learning classroom, with appreciation in particular for the structure of learning content and assignments, the clarity of information provided for student-centred activities, and the immediate feedback on their participation and performance. There is already a substantial body of literature on flipped learning which demonstrates the types of classroom activities that are highly valued by students and have positive impacts on motivation levels. In particular, it has been shown that these should be focused on “active learning”, which Jensen et al. (2015, p. 1) found to be the most important predictor of academic performance in both flipped and non-flipped learning contexts, and which Abeysekera and Dawson (2014) argue is what can be better facilitated in a flipped learning model than in conventional forms of teaching. Another approach recommended in the literature is the use of Bloom’s Taxonomy to activate students’ higher-order thinking processes in the flipped learning model (Giannakos et al., 2014; Talbert, 2014a).
The specific content and materials provided in the flipped learning unit were also found to have an important influence on students’ experience of the unit. Although this is another factor specific to this unit, the findings highlight the importance of providing high-quality content and materials in order to support the self-regulated learning process. Around a third of the participants were generally positive about the standard and ease of use of the unit materials provided to them. The majority expressed dissatisfaction with at least some aspect of the unit materials, saying for example that the reading was too complex or difficult to understand, that the unit materials were not relevant enough to their assignments, or that the videos were too long. These students’ motivation levels were found to be influenced by their perceptions of the unit content, which several learners reported overlapped with work they had already completed in their diploma courses. This suggests that the levels of motivation necessary to promote self-regulated learning can be increased by the selection of unit content that is interesting, stimulating, and relevant to the learners. This point is, of course, relevant to both traditional and flipped learning models. However, it can also be argued that in the case of flipped learning, the use of resources that stimulate learners’ interest and motivation is especially important in the absence of the motivating or encouraging presence of the instructor when working at home.

It was also clear, however, that some of the participants had an expectation that all the information required for their assignments would be provided to them, indicating a lack of awareness or understanding of the nature of flipped learning. As noted earlier, this demonstrates the importance of ensuring that all applicants for a unit involving flipped learning are made aware of the structure of the unit and the independent learning requirements, and that only those who appear well suited to this are accepted for the unit. It also provides support for the earlier suggestion that
the unit content might be delivered in a variety of formats to suit different learning styles, which for some might include more guidance, “exemplars”, or signposts to supplementary material.

Methods of assessment was another factor influencing students’ experiences of self-regulated learning in the flipped learning environment. As in the case of the other program-related factors discussed, the specific findings are related to this particular unit, but have wider implications for the best practice design of flipped learning units in general. The majority of the participants in this study expressed the view that the methods or criteria for assessment of their assignments were not clear enough or involved a subjective element on the part of the instructors marking their work. This view potentially presents a barrier to self-regulated learning, since it is important that students clearly understand the assessment criteria in order to set realistic goals, plan their work, monitor their progress, and regulate their efforts to ensure the assessment requirements can be met. Again, this is not unique to flipped learning—it relates to any type of academic assessment. However, it is especially important in a flipped learning environment because in the absence of substantial face-to-face support, students have to rely heavily on the online tools, including assessment criteria, to guide their self-regulated learning in the ways outlined in the Pintrich model (2004).

Finally, the findings highlighted the crucial importance of having access to appropriate IT when taking a flipped learning unit. A small number of participants argued that they might not have access to the relevant technology at home to properly engage with the unit. It seems inevitable that flipped learning will be delivered primarily via technology, reflecting the wider trend regarding computer and internet use by learners when researching and writing assignments. However, it is essential to ensure that the technology used to deliver the flipped learning content
is reliable, efficient, and universally available, and also that students possess the necessary skills and understanding of the technology to meet unit requirements. Some of the participants in this study reported examples of the technology failing and of confusion about how to use some aspects of it, which had negative impacts on both their morale and their productivity. Again, this is an aspect of flipped learning that can be readily improved by practical measures, such as providing a high-quality IT system and adequate IT support and training for students.

6.2.3 Flipped learning fostering and hindering self-regulated learning

The findings relating to sub-research question 3 pulled together key themes and points from all parts of the study to identify the main ways in which self-regulated learning is fostered by or hindered by the flipped learning environment. In summary, the analysis, as presented in Chapters 4 and 5, revealed three main ways in which the flipped learning environment fostered the use of self-regulated learning: (a) promoting independent learning; (b) improving engagement in learning; and (c) providing improved flexibility in relation to time and students’ learning methods. However, when considering these in combination with the earlier findings it is clear that, while flipped learning has the potential to foster the use of self-regulated learning in these ways, whether this is achieved in practice depends on a wide range of student- and program-related factors. First, unless students are already effective independent and self-regulated learners, or are provided with the necessary support and training to enable them to develop these skills, the flipped learning environment per se is unlikely to promote self-regulated learning. Similarly, unless a flipped learning program is designed in ways that support and promote self-regulated learning, this is unlikely to occur. Indeed, the findings also revealed a number of ways in which the flipped learning unit examined in this study.
With respect to (a)—promoting independent learning—once students shift away from a traditional approach to learning which is focused on the teacher providing direct oral instruction in a classroom context, a flipped learning model tends to result in a change to the kinds of strategies students employ to learn. First, students become far more proactive in searching for information from a variety of sources, such as journal articles, YouTube clips, Wikipedia, blogs, and peers. Once this starts to occur, it has a flow-on effect in terms of critical evaluation of sources—that is, students start to engage in systematic evaluation of sources with respect to their perceived usefulness to assessment tasks. As such, they critically judge found material in terms of intellectual authority, credibility, and veracity. Thus, students who are intrinsically motivated by an inherent interest in the subject matter are further encouraged to develop their critical thinking skills and to engage in independent learning by the flipped learning model. Even students who are extrinsically motivated only to achieve a good grade in the unit, tend to be compelled to develop their critical thinking skills and independent learning by the flipped learning model, precisely because they can no longer depend exclusively on the authority and direction of the instructor. Furthermore, such a model encourages students to be more organised in terms of their time management and their methods of searching for information, and to develop heuristic techniques for managing the completion of learning tasks (such as breaking down assessment tasks into a series of smaller, rationally sequenced steps). A concomitant side-effect of such self-organised study is that students are effectively required to become more disciplined and committed to the management of their learning. This in turn tends to develop a sense of “ownership” via the act of constructing the knowledge that occurs through the process of independent learning.
With respect to (b)—improving engagement in learning—the flipped learning model definitely facilitates this. Students began to engage more with the content of the unit than under the traditional teacher-centred approach. An important reason for greater engagement has to do with time—that is, in a flipped learning model where students engage in independent learning, there is greater scope for students to devote whatever time in necessary, and to pace their absorption of content, according to their own personal capacities. For example, for videos and texts, students could stop, review, and revise the content they were encountering at their own pace. If a key concept they encountered proved difficult to understand, students could stop and further reflect on it, or investigate it by drawing upon a variety of sources that explained it in different ways. This approach thus enables self-tailoring of pacing and the learning process as is suitable to the individual needs of each student. Also, taking the time to research a topic at home enables a student to be better prepared and therefore able to participate more effectively (and knowledgeably) in subsequent classroom discussions. As such, the independent learning inherent in the flipped learning model not only improved engagement with the unit content outside of class, but was complementary to engagement in class as well. This contrasts starkly with lectures, which are paced, have styles of explanation, and modes of participation determined by the instructor’s needs or constraints.

With respect to (c)—providing improved flexibility in relation to time and students’ learning methods—the flipped learning model seems to make a genuine contribution to self-regulation learning strategies such as elaboration and organisation as well as the metacognitive skill of planning. With respect to elaboration, a flipped learning model facilitates this learning strategy. For example, after being provided with foundational knowledge on a particular topic by the instructor (either face-to-face or online), if a student wishes to further explore a
concept or issue, rather than relying on an instructor to simply tell them more about it or make connections with other concepts, students themselves are more likely to search for resources and content to elaborate on the initial foundational knowledge. In this respect, the flipped learning model can encourage the self-regulated learning strategy of elaboration. It should be recalled that most students in this case study, and in many tertiary courses more generally, do not just have study commitments. They have family obligations and employment commitments which they have to “juggle” with their tertiary studies. As such students need to develop their organisational strategies. This is accentuated in a flipped learning unit because students are less structured and constrained by traditional classroom instruction—in other words, they are given greater freedom to organise their own learning activities at home. This greater flexibility effectively puts the responsibility on the students for ascertaining the goals of specific tasks, outlining how to approach those tasks (such as how to break down tasks into manageable parts), and selecting and clustering relevant material to assist them in their study. Concomitantly, the flipped learning unit gave to the students the opportunity to better manage their time in this regard, and as a result, it enabled them to explore and develop the metacognitive skill of planning of their study—in particular, preparing for in-class activities, deciding when to engage in research and writing for their assignment, and prioritising particular study tasks.

The findings also revealed a number of ways in which the flipped learning unit appeared to be hindering the participants’ ability to experience self-regulated learning. In summary, these consisted of: (a) timetabling and delivery issues; (b) a lack of adequate support; and (c) insufficient opportunities for collaboration and engagement with peers. Most of these factors have already been discussed in various ways in the preceding discussion, and overall they demonstrate the various aspects
of flipped learning that need to be taken into account when designing units in ways that promote self-regulated learning.

With respect to (a)—timetabling and delivery issues—one important difficulty with the implementation of a flipped learning model is ensuring (what students perceive to be) the “correct” sequencing of material covered online and the content of class discussions. If students perceive these to be out of alignment, or that some of the online material is ignored in face-to-face discussions, this can have a negative impact on goal orientation. In particular, the lack of extrinsic motivators associated with some of the online tasks can result in students questioning the value of these tasks; if some online tasks are neither marked or discussed at any stage of the unit, students may deem these tasks to be “worthless”. This in turn has a negative impact on the motivational strategy of expectancy; namely, if students come to expect that a task will provide no knowledge that will be validated within the unit, they may begin to ask why they should study it at all. Another important issue related to the design and application of a flipped learning model is getting the “timing” right of online material and face-to-face classes. If the online activities are not sufficiently frequently punctuated by face-to-face interactions with instructors and students (for example, if face-to-face classes occurred only once every two or more weeks), this may have the consequence of not permitting enough time in class to discuss all of the ideas that were covered online, thereby creating de-motivating confusion among students, and negatively impacting on their monitoring skills with respect to planning and task completion.

With respect to (b)—a lack of adequate support—this can have a negative impact on independent learning, especially when students are not familiar with and habituated to learning on their own. A lack of support for students in clarifying difficult issues dealt with online seems to be directly caused by a lack of integration
(that is, poor sequencing and transitioning) of online learning with classroom instruction. When online tasks and classroom activities are highly integrated, this provides an opportunity for instructors to provide support to students in terms of clarification, elaboration, reinforcement of organisational plans, feedback on progress, and general encouragement. Timely, regular support for students (be it online or face-to-face) gives them greater confidence and motivation to persist with online material which they might otherwise de-value or even ignore.

With respect to (c), limited opportunities for peer help-seeking is a danger because it is one of the most important self-regulation learning skills to be used in overcoming obstacles to understanding delivered content. Since in a flipped learning model some face-to-face classroom activities (where peer engagement is more likely) are shifted online, it is important that a platform (such as a discussion forum) is designed in such a way that students have the opportunity to engage in collaboration in order to assist each other in various ways (such as by clarification of issues, encouragement, and motivation). However, in the design and application of a flipped learning model, there is always a possibility that the platform for collaboration and engagement does not work exactly as expected. This is because its success is partly dependent on students’ perceptions of the validity of the platform as a method of engagement and support. For example, it is possible that some students will not value “clarification” of concepts by peers unless it is backed by the authority of an instructor.

6.3 Chapter Summary

This chapter has reviewed and examined the qualitative findings of the present study. With respect to research question 1, this chapter reflected on the motivational strategies, learning strategies, and resource management strategies identified in
Pintrich’s self-regulated learning model. The most general conclusion that can be arrived at is that the flipped learning model does not have a uniform positive or negative impact on each of the dimensions of self-regulated learning. Rather, different students exhibit very different degrees of self-regulated learning in a flipped learning context.

With respect to motivational strategies deployed, these seem to be heavily impacted by the extent to which particular students were initially intrinsically or extrinsically motivated. Intrinsically motivated students were more motivated and adapted fairly well to the flipped learning approach, whereas extrinsically motivated students tended to struggle. However, there were other factors that also impacted on motivational learning strategies. For students who lacked prior understanding of flipped learning, there was a degree of confusion about what was expected and how they should proceed through the unit, which was demotivating. Also, prior epistemological beliefs about learning capacity seemed to impact on motivation: students who believed that their learning capacities were under their own control better utilised motivational strategies, whereas students who believed their capacities were “set in stone”, so to speak, were less adept at remaining motivated.

With respect to learning strategies, similarly, there was a good deal of variation. Overall, critical thinking seems to have been facilitated by the flipped learning model, but the skills of elaboration and organisation proved to be less uniformly facilitated because in the model there was less emphasis on continuous guidance to students outside the classroom. (In the present case study, worksheets were provided to students which were intended to provide guidance, however the students themselves seem not to have recognised their function.) Thus, students who already possessed self-regulated learning skills were not detrimentally affected, but those who did not possess these skills already and were not guided explicitly, tended to
struggle with elaboration and organisation in the flipped learning unit. As for metacognitive skills (goal setting, planning, and monitoring), they did not seem to be much used, and peer help-seeking seemed, if anything, to have been undermined somewhat by the flipped learning model.

As to sub-research questions 2 and 3, the chief personal factors which seem to have impacted on students’ experiences of flipped learning were: personal learning styles (independent learners had positive experiences, but less independent learners did not); language skills (high proficiency in English was important to a positive experience); time management skills (strategic time managers did well); and prior familiarity with flipped learning (those familiar with the model tended to have positive experiences, but those who were new to the model did not). The chief program-related factors which, based on the students’ experiences, require careful consideration in applying the flipped learning model, included: the ratio of online to classroom learning; training and support for instructors; the alignment of online and classroom content and activities; the perceived relevance of the unit content and material; the methods of assessment (especially the extent to which they are perceived to be objectively codified); and students’ access to the necessary IT. Especially when students are inexperienced in operating in a flipped learning context, or do not possess highly developed self-regulation skills, these program-related factors need to be tailored to such students.

In general terms, it can be concluded that there are considerable differences between individual learners in their ability to utilise self-regulated learning strategies, and that the use of flipped learning per se does not necessarily result in self-regulated learning. As such, the success of the flipped learning model is heavily dependent on a tailor-made design that specifically addresses potential deficits in self-regulation skills so as to promote or facilitate self-regulated learning among all
learners. Various ways in which the flipped learning environment fosters and hinders self-regulated learning were identified in response to sub-research question 3, but these need to be qualified in the light of the findings about the many student- and program-related influences on experiences of self-regulated learning in this environment; these reinforce the need for thoughtful design of flipped learning programs as well as consideration of how to ensure that students accepted onto the program are likely to be well suited to this environment. Overall, it was found that flipped learning can foster self-regulated learning by promoting independent learning, improving engagement in learning, and providing improved flexibility in relation to time and students’ learning methods. It was also found, however, that flipped learning appeared to be hindering the participants’ ability to experience self-regulated learning in this particular research setting because of timetabling and delivery issues, a lack of adequate support, and insufficient opportunities for collaboration and engagement with peers. The findings suggest that these challenges may have arisen at least in part because of possible weaknesses and areas for improvement in the program design and delivery, but also because of limitations or constraints on the ability of some students to achieve the types or levels of self-regulated learning that this type of program can facilitate.

In the following chapter, the overall contributions and implications of the research findings are discussed, and this discussion is followed by sections that build on the results by setting out practical recommendations for the design and delivery of flipped learning units, as well as recommendations for further research in this area.
7 DISCUSSION II: CONTRIBUTIONS, IMPLICATIONS, AND SUGGESTIONS

7.1 Introduction

This chapter is concerned with providing an overall evaluation of the current study. As its title suggests, it first outlines the major contributions that this study makes to the existing literature on self-regulated learning in the context of a flipped learning unit. Concomitantly, it points to the theoretical and practical implications of the findings of the study. Thereafter, it offers some suggestions for the future application of the flipped learning model to university-level units in a manner than helps to foster self-regulated learning. Second, the chapter examines the limitations of the present study and makes some suggestions for future research in this important area.
7.2 Contributions of the Study

This research is important in contributing to an improved understanding of how self-regulated learning occurs in a flipped learning program in the higher education context, based on the case study sample of pre-service teachers studying at an Australian university. Although specific to this case study setting, the findings and conclusions reached are expected to be of wider interest and importance to higher education institutions that are considering the implementation of flipped learning initiatives. The use of a theoretical and analytical framework based on Pintrich’s model of self-regulated learning, along with the use of a qualitative case study research methodology, has enabled me to provide insights into the ways in which self-regulated learning occurred in the flipped learning case study setting, and the range of factors influencing this and students’ experiences of the flipped learning program.

7.2.1 Considerable individual differences

In contrast with previous studies of students’ experiences of flipped learning (e.g., Butzler, 2016; Erkan et al., 2015; Hao, 2016; Koo et al., 2016; Talbert, 2015; Tawfik & Lilly, 2015; Van Vliet et al., 2015; Yong et al., 2015), this research has revealed considerable differences between students in their views and experiences of the program, and also in the extent to which they demonstrated various types of self-regulated learning. It is possible that the differences between the findings of this and previous studies of flipped learning relate to the methodological approach used. In particular, it is believed that by using a systematic theoretical framework based on Pintrich’s (1991, 2004) self-regulated learning model, combined with the use of in-depth qualitative methods to explore the detailed self-reported experiences of the
research participants, this study was able to identify in depth the range of experiences and views of these students on a range of different dimensions.

7.2.2 Relationship between self-regulated learning and attitudes towards flipped learning

Although this qualitative research did not directly examine the relationship between self-reported quality of participant experience of the program and students’ self-regulated learning behaviours, or the impact of flipped learning on academic performance, the overall findings do suggest that students demonstrating more extensive self-regulated learning behaviours tended to have more positive views on the flipped learning program, and in many cases the responses of these students indicated that they were performing well in their studies. In contrast, many of those who expressed less positive views were also demonstrating fewer examples of self-regulated learning behaviours, and their responses suggested that at least some of these students were facing more challenges and difficulties with their studies. It must be stressed that the qualitative nature of the study means that these statements are tentative and not conclusive, and also that it is not possible to disentangle the inter-relationships between variables. For example, it is not known whether pre-existing negative attitudes towards flipped learning resulted in unwillingness or resistance on the part of some students to practise self-regulated learning, or whether it was their inability to self-regulate learning that resulted in negative perceptions of the flipped learning unit. Regardless, the research findings are especially important in demonstrating the need to acknowledge the diversity of students in a flipped learning unit and to ensure that adequate resources and support are provided to enable each individual to develop and exercise the self-regulated learning skills and abilities necessary for academic success in this context. Since the findings also highlighted changes over time in the research participants’ levels of self-efficacy
and their self-regulated learning behaviours, this indicates that these are not fixed skills which predetermine experiences and performance within a flipped learning environment, and that programs can therefore be designed in ways that promote the development or use of these self-regulated learning abilities. The potential benefits of this in improving the attitudes of learners to the flipped learning approach over time have already been demonstrated by research conducted among higher education students in Australia by Butt (2014).

7.2.3 Students’ background characteristics

Throughout the analysis of data relating to both sub-research questions 1 and 2, consideration was also given to whether any of the recorded background characteristics of the participants appeared to influence the distribution of responses. In particular, the distribution of responses was examined by the variables of age, prior education, previous experience of online/blended learning, and prior experience of flipped learning. A few slight differences with respect to age and prior education allowed for some speculation about the potential impacts of these variables on self-regulated learning behaviours in the flipped learning environment, as highlighted in Chapter 4. Unfortunately, the small number of participants with prior flipped learning experience did not allow for much scrutiny of the impact of this variable. Overall, however, the main finding arising from the examination of the impact of background variables was a lack of notable patterns in the data: on the whole, responses were distributed quite randomly across participants regardless of their age, prior education, or experiences of online/blended or flipped learning. This reinforces the argument that flipped learning programs should be designed in ways that promote and facilitate self-regulated learning among all students, without any assumption being made that any will already possess these skills and abilities.
7.2.4 Continuing relevance of Pintrich’s theory

As a secondary focus, this study is also important in highlighting the extent to which a leading theory of self-regulated learning continues to be relevant and useful as a framework for research into new approaches to learning, and the ways in which it also needs to be modified to reflect the changing educational environment—particularly the growth of technology-enabled distance learning. Arguably, the self-regulated learning theories of Pintrich (1991, 2004), Zimmerman (1990), and others are more important than ever given the changing nature of the tertiary education environment: many students must now take a greater degree of responsibility for learning independently and off-campus from their educational institutions. This has elevated the need to understand the individual learning process so that measures can be taken to ensure that the opportunities for effective learning can take place. But most leading theories of self-regulated learning were originally developed at a time when the traditional, teacher-centred, face-to-face model of higher education was still dominant. In this model, students learned passively while attending on-site lectures, and reinforced their learning by additional study in their own time. The “learning hub” change characterised by the emergence of the flipped learning model overturns the old approach, with most learning in this model being undertaken by students working independently online and off-campus, and a relatively small amount of on-campus classroom time being used to facilitate and reinforce their independent learning. Self-regulated learning theories are thus increasingly being applied to more independent, primary learning rather than just the secondary learning of material that students would be otherwise first exposed to in the classroom. However, because research has lagged behind the rapidly changing tertiary education environment, our knowledge about the continuing relevance,
efficacy, and value of self-regulated theories in this context is relatively poor. The present study seeks to contribute to our knowledge in this regard.

7.2.5 A qualitative methodological approach to using Pintrich’s theory

Finally, the study makes an important methodological contribution to the body of research on flipped learning and self-regulated learning by demonstrating the potential of Pintrich’s (1991, 2004) model (which was designed primarily for quantitative measurement of self-regulated learning behaviours) for studying self-regulated learning using qualitative methods. The *Motivated Strategies for Learning Questionnaire Manual* (Pintrich et al., 1991) includes detailed descriptions of the types of behaviour that characterise each component of the self-regulated learning model, and proved invaluable to the current study as a deductive analysis tool. The data from the interviews, focus groups, and learning logs were scrutinised in detail to identify self-reported descriptions of learning behaviours that corresponded closely with those of the manual, and this was found to be an effective way to identify examples of behaviour reflecting self-regulated learning as conceptualised by Pintrich (1991, 2004). It is also possible that the use of relatively unstructured phenomenological data collection methods in the present study enabled more detailed insights into student experiences of the flipped learning unit to emerge than were possible in studies that used more structured forms of data collection, or that had methodological limitations which gave rise to positive biases in the findings. By providing greater insights into the challenges experienced by students in the case study unit, and the concerns they expressed, this provides an opportunity to understand how to design flipped learning units in ways that better meet the needs of all learners.
The research therefore has important theoretical and methodological implications relating to the understanding of self-regulated learning in a flipped learning context, as well as important practical implications regarding the ways in which flipped learning programs might be developed in order to promote self-regulated learning. The theoretical and practical implications of the study are discussed further in the following sections.

7.3 Theoretical Implications

Pintrich’s model of self-regulated learning has been used as a framework for understanding and evaluating the effectiveness of a flipped learning environment in enhancing self-regulated learning. It is appropriate then to reflect more generally on whether, on the one hand, Printrich’s model (2004) has proved to be applicable to this type of teaching environment, and whether, on the other hand, the flipped learning environment is effective in promoting self-regulated learning in the light of Pintrich’s theory. Overall, even though Pintrich’s theory was not originally designed with flipped learning in mind, it has been found that the theory remains useful and relevant for research into flipped learning. The analytical framework based on this model proved to be a good fit to the research data, with evidence of the types of behaviours outlined in most of the components of Pintrich’s (1991) MSLQ. Use of the model was especially important in revealing a fairly sharp division within the sample, between those individuals who exhibited many of the behaviours described in the model and could be regarded as highly self-regulated learners, and those who exhibited fewer of these behaviours and could be regarded as less self-regulated learners. More broadly, the findings demonstrate that the social cognitive approach to understanding self-regulated learning, which is based on Bandura’s original theory and has been adopted by many other researchers (e.g., Puustinen &
Pulkkinen, 2001; Zimmerman, 2000a) remains relevant and applicable to the study of self-regulated learning in today’s flipped learning environment.

It should be noted, however, that the analysis also revealed that some aspects of Pintrich’s self-regulated learning model might not be perfectly suited to evaluating students’ self-regulated behaviour in a flipped learning environment. For example, the model seems to be built on the assumption that most learners are largely driven by an intrinsic desire to study a subject. In the context of today’s competitive labour markets, this is an increasingly untenable assumption, since many students enrol in university courses for mainly extrinsic reasons, such as gaining the qualifications needed to secure a good job, as revealed by the responses of several of the participants in this study. Similarly, the model tends to neglect the fact that students of all ages now face many other life commitments, particularly paid employment, which often put serious constraints on their study time and ability to focus wholeheartedly on independent learning. The results of this research indicate that the majority of the students in the flipped learning unit feel overwhelmed by their responsibilities and express a desire to be more supported in their learning (for example, through more in-depth online and assessment feedback). Also, the rehearsal component of the Pintrich model (2004), which involved simply memorising information, is less applicable not just to flipped learning, but to the new forms of learning that are emerging in the 21st century educational environment and which focus more on understanding and critical thinking within highly social learning contexts than on learning individually and by rote. The findings of this study thus indicate that theories of self-regulated learning that were developed more than two decades ago may need to be modified to reflect these new approaches to learning; for example, in addition to self-regulated learning, the integration of group-regulated learning may need to be more systematically theorised. Overall, the
results indicate that there may be a much more complex relationship between self-regulated learning, the learning environment, and student experiences than Pintrich’s model of self-regulated learning suggests. With slight modifications as noted above, however, it can be expected that Pintrich’s model (2004) of self-regulated learning will continue to be a highly valuable tool for the quantitative and qualitative investigation of self-regulated learning, both in a flipped learning environment and in educational settings more generally.

7.4 Practical Implications

The findings of this study have important practical implications for the design and evaluation of future flipped learning environments. The students in this unit reported very mixed experiences and views of the unit, which appear to relate largely to their personal learning styles and preferences but also to design features of the unit. The findings of the research thus provide insights into the types of factors that instructors should be mindful of when selecting applicants for a flipped learning academic unit, and the types of support that may be required to ensure that all learners accepted into such a unit are able to meet the independent learning requirements. The analysis also revealed ways in which the flipped learning model, at least within the present case study environment, was not as supportive of self-regulated learning as it might be—specifically in the peer learning and help-seeking elements of the resource management element of the model. This type of information is helpful in identifying the ways in which flipped learning programs might be designed in order to maximise self-regulated learning. For example, it is important to ensure that programs incorporate opportunities for students to interact either online or in person, and that sufficient support is provided to meet the needs of students with a variety of different learning styles. The findings also revealed
elements of the unit studied that might be regarded as best practice and adopted by other institutions. For example, those participants who were positive about the structure and content of the course praised elements such as the user-friendly nature of the online system and content, and the quality of classroom instruction. These findings may in part reflect differences in the research setting and students sampled, but are important in this respect in highlighting the need to tailor flipped learning to different learning environments.

The findings of the study clearly demonstrate that for those students who are naturally independent learners and already possess many of the skills involved in self-regulated learning, a flipped learning unit can be a very positive learning environment. For others, there may be a need to learn or build independent learning skills in order to take advantage of the potential benefits of this environment. The discussion of results in this chapter has highlighted many ways in which steps might be taken to improve the flipped learning program so that it better supports self-regulated learning. These include, for example, the provision of initial training in self-study skills, more opportunities for interaction between students, and addressing timetabling issues that at present are confusing for many learners and have an adverse impact on motivation. These findings are valuable not just for the case study institution, but also for other universities considering the adoption of a flipped learning program. (Further discussion of practical recommendations arising out of these implications is provided in the next section of this chapter.)

From a broader perspective, the findings of this study also contribute to a better understanding of how a new educational model, namely flipped learning, can promote or hinder learning, and how the model can be designed in ways that enhance its positive effects. As discussed in Chapter 2, as the demand for lifelong learning is increasing (Allen & Velden, 2011), flipped learning may offer a cost-
effective way of delivering more learner-centred programs in place of the traditional, instructor-led approach (O’Flaherty & Phillips, 2015). There will be an increasing need for practical guidance on how to design flipped learning programs that suit the needs of all learners, so that they can ultimately contribute in productive ways to society. This research provides important insights into issues for consideration when doing so.

In the following section, the findings are translated into a set of broad recommendations for the design of flipped learning programs in higher education. Although the specific standards for best practice in the design of flipped learning programs will depend on the specific setting, subject area, and student population, these recommendations are likely to be broadly relevant to a wide range of higher education settings.

7.5 Suggestions for the Application of Flipped Learning

Based on the findings of this qualitative study of students in a flipped learning unit at an Australian university, the following suggestions are made for the design and implementation of flipped learning initiatives in higher education (not just for the unit examined in this study).

7.5.1 Understanding of flipped learning

Especially for students who have experienced a more traditional approach to teaching, it is important to ensure that all participants in an academic unit have a complete understanding of what “flipped learning” consists of and what will be expected of them throughout the semester (McLaughlin, White, Khanova, & Yuriev, 2016; O’Flaherty & Phillips, 2015). This will guard against confusion on the part of students who may otherwise assume that the self-regulated learning skills they have utilised in the past will be transferable without alteration to the (new) flipped
learning unit. This suggestion addresses the finding of the current study that many students were not aware in advance that they were enrolled in a flipped learning unit, and as a result did not seem prepared for the self-regulated learning required for success in such a unit.

Students may be “initiated” into the flipped learning model by a variety of techniques. For example, the course prospectus (or unit learning guide) could include a detailed description of flipped learning, backed by academic references. Also, the lead-instructor could provide a positive, detailed description of the way in which the flipped learning model “works” and how it is different from a more traditional model, in a face-to-face introductory session (at the very beginning of the semester). In addition to the somewhat abstract descriptions given above, students could be shown short videos of concrete examples of actual flipped learning utilised in the university context. This may help students to visualise what would be practically involved in the flipped learning model and better prepare (or prime) them with respect to the skills they will need to utilise.

7.5.2 Prior epistemological beliefs

Even with introductory descriptions and instruction about what is required of them in a flipped learning unit, some students may harbour prior epistemological beliefs that would not be conducive to flipped learning, such as the belief that their cognitive capacities are essentially fixed and very limited. As such, it would be desirable to implement workshops at the beginning of the semester designed to boost sense of students’ self-efficacy by ensuring they understand that their current abilities are not immutable, “given” traits, and that they can be manipulated and improved by study-effort (Chen et al., 2014; Cromley et al., 2016; Koo et al., 2016; Lehmann, 2012). This should help enable them to overcome unhelpful prior
epistemological beliefs and foster the development of greater self-control over their learning outcomes, thereby enabling them to become better self-regulated learners. This addresses the finding coming out of the present study that, over time, some of the students demonstrated an increase in self-efficacy and in self-regulated learning skills, while others conveyed through the interviews and focus groups a sense that their abilities could not be improved.

7.5.3 Suitability and adjustment

It should be borne in mind that the success of a flipped learning unit is heavily dependent on the availability of sufficient time for development, resources (both financial and pedagogical), and well-trained instructors. Thus, it is crucial to consider whether a particular academic unit is suitable for flipped learning before adopting this model if time, resources and experienced staff are in limited supply (Hamdan et al., 2013). Another possible barrier to the success of a flipped learning unit is the nature of the academic unit itself. Indeed, in the present study, some of the participants questioned whether flipped learning is suitable for a pre-service teaching degree in which there is a heavy emphasis on understanding the behaviours of children through observation and interaction. Certainly, a case can be made that highly “practical” academic units, and academic units that necessarily require a large amount of face-to-face instruction in order to ensure that students understand “core” material, might not be suited to flipped learning. However, this again may in fact be a matter of available resources and time to design an appropriate flipped learning approach, rather than being an inherent limitation of the model. In the case of a “practical” unit, for example, flipped learning could be calibrated in such a way that in one week there is a focus on theory followed in the next week by a practicum that applies the theory, which in turn is followed by another week of reflecting (in a
face-to-face or online context) on the issues involved in (the “lessons learned” about) the weaving together of theory and practice, and so on. In relation to this suggestion, it is important to emphasise that in order for instructors to be effective facilitators of knowledge construction, it is essential that instructors receive the necessary training to enable them to transition to this new role. Achieving this will help ensure that students are able to proactively seek out answers and solutions to any difficulties encountered, rather than waiting for the instructor to provide these.

7.5.4 The online to classroom ratio

Consider the optimal online to classroom-based learning ratio. Of course, what constitutes an “optimal” mix is highly context dependent—it will change according to variables such as the nature of the academic unit’s material or content and its learning objectives, the prior experience of the students (of flipped learning and traditional methods), the students’ needs and prior knowledge, the kinds of activities that must be engaged in (e.g., teamwork or individual assignments), and the availability of resources. For example, in the academic unit that was the subject of the present study, the findings revealed that having only one classroom session per fortnight tended to hinder some aspects of self-regulated learning (Simpson & Richards, 2015). Thus, for the academic unit of this case study, given that a number of participants expressed anxiety about “not covering” all the weekly online material in class, increasing the face-to-face classroom sessions to weekly bases may help improve peer learning by increasing students’ familiarity with one another, as well as motivating learners to study more consistently in order to prepare for the weekly sessions. It should be noted that face-to-face time for interactive discussion and instruction need not always occur in a physical classroom—it is possible to fulfil
this need by new technological means, such as Zoom or Facebook Live, where instructors can lead discussions or give online support and guidance to students.

7.5.5 Alignment of classroom instruction with online content

In addition to the ratio of online to classroom learning, it is vital to consider the alignment of classroom instruction with the online content (McLaughlin et al., 2016): all topics covered in independent study should ideally be addressed to some extent in the face-to-face instruction time, thereby giving students an opportunity to reinforce their independent learning and to seek help for any difficulties encountered. The findings of the current study revealed that the self-regulated learning of some participants was being adversely affected because of confusion about the purpose of classroom sessions and a lack of co-ordination of the topics covered in these sessions with those covered at home. This appeared to reduce the potential for using self-regulated learning skills such as elaboration, organisation, and metacognitive self-regulation, as it was difficult for students to make linkages between different areas of work and to regulate their own progress.

As to the extent and method of addressing the prior-studied online material in the classroom environment, this is again highly context dependent. For example, in some cases, it may involve only a brief summary of the online material; in other cases, it may involve a more elaborate discussion of all the major topics for a given week. Whatever the case, the present study suggests that the alignment between online and classroom material should be relatively tight and complementary, lest students regard the material as being somewhat incoherent or one mode of instruction as being irrelevant to the other. Further, the classroom time should still be focused on building knowledge construction and problem-solving skills among the students (rather than simply conveying knowledge), as it is this which helps to
strengthen self-regulated learning and reduce students’ reliance on the traditional role of the instructor.

7.5.6 Variety in learning materials and delivery methods

Consider offering a *variety of learning materials and delivery methods* to suit the different learning styles of students. The findings of the current study indicated that the self-perceived “learning style” of students may have a strong influence on their experiences of self-regulated learning in a flipped learning model.

Flipped learning units rely heavily on the delivery of content using ICT and this also facilitates the use of a variety of multimedia delivery methods, such as videos, quizzes, and links to a range of other online reading and content. By incorporating a range of delivery methods and learning materials, courses can be designed to promote self-regulated learning among all students, including those with lower levels of English language ability or independent learning skills. This will be important to help ensure that students can perform well on the motivational strategies components of self-regulated learning (Pintrich et al., 1991). Muir & Geiger (2016) note that in order to improve students’ motivation to actively engage in the online learning activities, a flipped learning model should “foster a sense of competence, relatedness and autonomy in students” (p. 157) and that an important way of achieving this is by tailoring activities to their expertise and enabling them to self-pace their work.

7.5.7 Timely and constructive online support, guidance, and feedback

Ensure that *timely and constructive online support, guidance, and feedback* from unit instructors is readily available so that difficulties encountered in the learning process do not delay students’ progress or have a demotivating effect (Butzler, 2016; C. Lai & Hwang, 2016). This suggestion addresses the current study’s finding
that the self-regulated learning of many of the participants appeared to be hindered by a lack of opportunities to seek help when necessary, or to obtain timely and useful support. Indeed, it has been noted in the literature that a lack of adequate external support is one of the main reasons why learners abandon online courses (Park & Choi, 2009; Willging & Johnson, 2009).

It would thus be highly beneficial in a flipped learning model if instructors could respond to students’ online queries, questions, and requests (via discussion boards and emails) expeditiously. Since much of the learning material is online, and it is expected to be absorbed outside the classroom environment, when difficulties arise in understanding, it is necessary that students have the facility to gain clarification quickly so that they can progress with their online learning before classes. This would help to ensure that students are kept motivated and are able to manage their time effectively without experiencing delays in progress while waiting for help. As such, it would be greatly beneficial if instructors monitor and actively participate in discussion boards (in a positive and encouraging way) and respond to email requests every day. There are obviously personnel constraints to consider here. The provision of adequate support may require assigning more instructors (on a roster system perhaps) to support students in their online activities, rather than relying on just a single unit coordinator with responsibility for responding to emails or discussion board posts.

7.5.8 Study guidance and directions

Ensure that students are provided with and are made fully aware of the study guidance and directions, as well as objective assessment criteria. Students may need to be explicitly assisted to understand that assessment rubrics and standards exist to support them and to render the assessment process objective, as well as to
understand what kinds of learning tasks they need to engage with and prepare for before coming to classes. This explanatory support is essential to enabling students to effectively practise the self-regulated learning strategies of organisation and metacognitive self-regulation, by identifying their academic goals, planning their work, and monitoring and regulating their progress to ensure that their goals can be achieved. They are also crucial for effective time management.

Some researchers have suggested that, in order to foster students’ self-regulated learning, flipped learning materials might incorporate prompts to encourage self-regulated learning strategies (e.g., goal setting, self-assessment, reflection, summarising, and questioning or seeking help). For example, learning logs might be designed to require documentation of these strategies, thus helping to facilitate students’ transition from a passive to an active learning experience (Butzler, 2016; Moos & Bonde, 2016).

Furthermore, to achieve the control of learning beliefs aspect of self-regulated learning, it is essential that students understand that their grade depends on making an argument that is well supported, regardless of the conclusion they reach and whether this is aligned with the views of the assessor. The literature (C. Lai & Hwang, 2016) indicates that one way of improving students’ self-efficacy as self-regulated learners is to provide personalised feedback on performance; at the same time, this must reflect objective assessment criteria. Assurance of quality control of the assessment process may also be important in helping to overcome student perceptions of subjectivity in the marking process (such as by using second markers on key student assignments).
7.6 Limitations of the Study

Overall, this study has been successful in providing extensive insights into the experiences and behaviours of a sample of university students in a flipped learning unit. However, the study has a number of limitations that must be taken into account when interpreting the findings. First, the research results relating to the existence of self-regulated learning behaviours were not directly observed based on validated indicators such as those included in Pintrich’s MSLQ; rather, they were inferred from the self-reported experiences of the participants and were then matched in broad terms to the descriptions in Pintrich’s model. While this provides a broader understanding of how self-regulated learning is manifested in practice, the observed behaviours cannot be regarded as exactly representing the components of Pintrich’s model since the participants were not asked the specific MSLQ questions.

Second, given the qualitative, case study methods adopted for this study, the specific findings are most relevant to this setting and cannot be automatically and unreflectively generalised to other learning environments. This is a limitation, but not a flaw in the study, since the purpose of qualitative research is to provide an in-depth understanding of a phenomenon in the lived experience of a particular sample of individuals, and not to generate data that can be generalised to a wider population. Nonetheless, the setting and sample of learners are not believed to be atypical of university students in pre-service teaching degrees, and the findings are likely to be of interest and relevance to other institutions developing similar flipped learning units.

Despite the efforts to use a criterion based sampling method, a further limitation of the study is the voluntary self-selection of students into the sample. Based on the research findings, the sample included a diverse range of participants with a variety of personal characteristics and learning behaviours, and from several sites within the
university. However, none of the small number of male students on this unit volunteered to participate, so it is not known whether the experiences and learning behaviours of male students would have been different from the female participants in the study. Previous quantitative studies have shown that females tend to be more self-regulated learners than male students on most variables, but that they perform lower on aspects of self-regulated learning such as self-efficacy (e.g., Hargittai & Shafer, 2006; Zimmerman & Martinez-Pons, 1990). These differences indicate that the inclusion of male students in this study may have influenced the findings. Further, given the wide diversity of views and experiences of flipped learning and self-regulated learning demonstrated by this sample, it is highly probable that the selection of a different sample of individuals would have generated a different spread of findings. This does not, however, undermine the value of the study in demonstrating a wide range of experiences of self-regulated learning in the flipped learning context, and highlighting the types of factors influencing these.

Another limitation of the study related to the use of trace data to triangulate the qualitative research findings. When the present study was originally conceived, it was believed that the online software's learning analytics would be able to capture a wide variety of detailed online behaviour at the level of each individual student. For example, it was initially believed that the learning analytics would capture the amount of time spent by each student engaging with particular content items within specific folders on the support website. Such trace data would have helped to identify the goal orientation and motivation of each student by revealing the absolute and relative amounts of time spent on particular learning tasks. It was also believed that trace data could be collected about how much of each learning module was completed by each individual student; this would have included video viewing behaviour (such as, how many videos and how much of a video had been watched).
Unfortunately, it turned out that the learning analytics available from the support website were considerably less sophisticated and less fine-grained than anticipated; the system excluded certain types of online behaviours, such as those mentioned above, from its reports. This made it impossible to quantify some these behaviours against self-regulated learning indicators. Although some useful data was extracted and used to triangulate the qualitative findings of the study, only very tentative conclusions could be drawn from this data due to the limitations of the learning analytics. Nonetheless, it did demonstrate the potential for the use of this type of data for future mixed-methods research in this area, in which trace data systems might be designed at the outset in ways that would more usefully contribute to understanding of the nature of self-regulated learning in the flipped learning environment.

Finally, as the researcher as well as the interviewer and focus group facilitator, I made every attempt to remain completely objective and neutral throughout the processes of research design, data collection, analysis, and interpretation. However, the possibility of some researcher bias cannot be completed ruled out. My personal beliefs and perspectives about the phenomenon of self-regulated learning within the flipped learning model may have influenced the way I interpreted the participants’ accounts; I may have also inadvertently influenced the participants’ responses to a degree, especially as the participants were aware of my own interest in the topic as a graduate student.

7.7 Suggestions for Further Research

In order to fully understand the ways in which the flipped learning model promotes or hinders self-regulated learning, the differences in experiences of flipped learning between different types of learners, and the ways in which self-regulated
learning can be maximised in the flipped learning environment, it is recommended that future quantitative and qualitative research should be conducted in this area.

In the past, much of the research conducted on self-regulated learning used quantitative methods to measure various forms of self-regulated learning, such as those identified in Pintrich’s (1991, 2004) model, and to examine the impacts of self-regulated learning attributes on learning outcomes. However, this research was generally carried out in more traditional teacher-centred learning environments. A very limited number of recent studies have investigated self-regulated learning in a flipped learning environment using qualitative methods (e.g., Erkan et al., 2015; Tawfik & Lilly, 2015) or mixed methods (Moos & Bonde, 2016).

The present study has demonstrated, using qualitative methods, that some students have positive experiences of flipped learning and demonstrate many behaviours associated with self-regulated learning, while others have less positive experiences and demonstrate fewer examples of self-regulated learning. It is first recommended that future research should use quantitative methods to measure self-regulated learning in a flipped learning environment, ideally within a discipline or subject area previously studied using the same research instrument but in a traditional learning environment. In this way, self-regulated learning behaviours can be compared between the two environments and within the flipped learning sample, and the findings can also be compared with those of other previous studies of flipped learning. This will provide a more robust understanding of the impact of flipped learning on learning outcomes and the factors influencing this relationship, which can be used to design programs that maximise positive learning outcomes for all learners.

It is also recommended that future qualitative or mixed-methods studies of flipped learning are conducted in a wide range of learning environments. This study
has demonstrated the value of qualitative research in providing a more in-depth understanding, from the learner’s perspective, of the experience of flipped learning and the factors that influence this experience. Although quantitative methods allow researchers to investigate observable behavioural relationships between self-regulated learning, flipped learning, and learning outcomes, qualitative methods are important in providing a phenomenological understanding of why these relationships occur, and the specific ways in which the positive experiences of flipped learning can be enhanced in order to strengthen such relationships. This type of information is needed to inform the development of best practice in flipped learning, and also to support understanding of the ways in which flipped learning initiatives need to be adapted or tailored to the needs of different groups of learners and different educational settings. Mixed-methods studies, which combine quantitative measurement of learning behaviours using self-completion surveys with in-depth interviews and/or focus groups, can be valuable in a case study setting to provide a comprehensive understanding of how flipped learning can be used to achieve desired educational outcomes.

Finally, it is recommended that online learning systems be designed in ways that are aligned with self-regulated learning models and automatically generate data that can be used to assess learning processes. If online learning systems are designed with the assessment of learning processes in mind, this can provide a means of evaluating the effectiveness of online learning systems and how to improve them by, for example, identifying which components are under-utilised and need to be better adapted to the needs of learners in order to promote self-regulated learning.
8 CONCLUSIONS

Flipped learning is an educational approach that is expected to become increasingly popular in line with the growth of more student-centred approaches to learning, demands for flexible forms of lifelong learning, and budgetary pressures on educational institutions. This is being facilitated by advances in technology, which enable learners to study in locations remote from their university using online tools and resources. However, although the concept and practice of flipped learning have been in existence for more than 15 years, there has been little attempt to examine the impact of this learning model on self-regulated learning or to investigate the ways in which the model needs to be adapted to the needs of different learners and educational settings to generate optimal academic outcomes. As a result, flipped learning units are often introduced with little consideration of how their specific design can promote or hinder the learning process. This view was substantiated by Gosper et al. (2010) who examined the adoption of online units in a sample of Australian universities and argued that, although this adoption has been increasing considerably in recent years, approaches to teaching have not evolved in line with the changing delivery methods.
Previous researchers have demonstrated an association between self-regulated learning and positive learning outcomes, but most previous research in this area has been carried out in traditional, instructor-led educational settings—not in a flipped learning context. Most previous research on self-regulated learning has also been conducted using quantitative methods to identify and measure self-regulated learning behaviours and their impact on learning outcomes. Relatively few studies have used qualitative methods to investigate the phenomenological experiences of self-regulated learning or flipped learning from the students’ perspectives. The limited previous research that has been conducted in this area suggests that flipped learning potentially offers significant benefits for learners and positive academic outcomes, such as the development of critical and higher-level thinking skills (e.g., De George-Walker & Keefe, 2010; Giannakos et al., 2014; McLaughlin et al., 2013; Talbert, 2014; Zainuddin & Halili, 2016).

The present study has addressed two significant areas where still less research has been conducted. First, it has examined self-regulated learning in a flipped learning environment. Second, it has used qualitative methods to investigate students’ own perceptions and experiences of flipped learning and to identify examples of self-regulated learning from their personal accounts. The research has sought to provide new insights into the ways that self-regulated learning occurs in a higher education flipped learning unit, and by using a conceptual and analytical framework based on a self-regulated learning model, has sought to show how flipped learning can be designed to facilitate and promote this form of learning.

One of the most important findings of the study—which contrasts somewhat with the generally very positive reports on the flipped learning model—is that there are substantial differences between individual learners in their experiences of flipped learning, and that these differences appear to relate in large part to their
preferred learning styles and the extent to which they already possess self-regulated learning skills. As previous researchers have pointed out (e.g., Balapumi et al., 2016; Cassidy, 2011; Roth et al., 2016) not all higher education students arrive at university with the skills necessary for independent study, and there has been a widespread lack of support and training to assist them to develop these skills, even in the traditional lecture-based higher education context. De Boer et al.’s (2013) meta-analysis revealed that, unless they receive instruction in self-regulated learning strategies, students are unlikely to develop these strategies. When learners are relatively isolated for much of the time in a flipped learning program, it becomes even more important to ensure that they possess the right types of skills for self-regulated learning. This is also in line with Green’s (2015) argument that improved “scaffolding” is needed to help students bridge the learning distance between what is known and what is unfamiliar to them. It also coheres with the conclusions of Lee, Teo, and Chai (2010) who found that metacognitive skills among pre-service teachers varied considerably by level of teaching experience and that measures are needed to promote these among less experienced individuals.

However, the participants in the present study also expressed dissatisfaction with many aspects of the flipped learning model, and their responses suggested that a lot could be done to design flipped learning units in ways that promote rather than hinder self-regulated learning. Some of the key points arising from the analysis were used to develop best practice recommendations for the design of flipped learning programs earlier in this chapter. In particular, the research findings revealed the importance of effective alignment between the independent learning and the classroom-based components of the unit, and of having sufficient opportunities for interaction with other students and with unit instructors, whether this involves
increasing the ratio of classroom to off-campus learning or providing more effective tools for engaging students in online forms of interaction.

Previous researchers have argued that flipped learning remains under-utilised and under-explored in the higher education context (Chen et al., 2014). The present study contributes to an improved understanding of this approach and the factors that influence students’ experiences of the flipped learning model and their self-regulated learning behaviours. The overall conclusion of the research is that the case study flipped learning model has considerable potential to support and promote self-regulated learning, but that there are a number of avoidable, but easily overlooked, pitfalls that instructors need to be cognisant of when designing flipped learning units. The insights generated from analysis of the qualitative accounts of the research participants have wider relevance and applicability to other higher education institutions that are considering the adoption of a similar flipped learning unit. It is hoped that future research will build on the methods and findings of this study to provide a more comprehensive understanding of the potential role of the flipped learning model in promoting self-regulated learning in a range of educational settings, as well as offering suggestions regarding how to take optimal advantage of self-regulated learning through program design, the development of guideposts to the appropriateness of “flipping” an academic unit, and guidelines to facilitate students’ transition from traditional teaching approaches to a flipped learning approach. This will hopefully enable the flipped learning model to play a key positive role in higher education worldwide, helping to equip learners not only with robust knowledge of their academic disciplines, but also with the higher-level thinking and learning abilities necessary for personal success in the 21st century.
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Flipped Learning and Self-Regulated Learning Experiences in Higher Education: A Qualitative Case Study


(Retrieved on 5 November 2017)


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APPENDIX A: UNIT DESCRIPTION, ASSESSMENTS AND SCHEDULE
Unit Description

This unit explores Primary Science and Technology. It provides opportunities for students, as pre-service teachers, to prepare for their future employment as a graduate teacher in Primary Education. Students will develop skills in pedagogy and practice within the area of Primary Science and Technology. The knowledge and skills developed in the other units of study in the course can be applied in this unit and Professional Experience units. Graduates of the Masters of Teaching (Primary) will be provided with the opportunities to:

1. To prepare graduate level teachers who are equipped with the content, pedagogical and pedagogical-content knowledge, teaching and interpersonal skills, commitment and enthusiasm required to begin and develop a career of quality teaching for quality learning in primary schools.

2. To develop graduate level teachers who demonstrate empathy with diverse groups of student learners and commitment to socially just schools and classrooms.

3. To develop graduate level teachers who can demonstrate autonomy and commitment in their personal and professional learning and continuous, reflective professional practice.

Assessment Tasks

<table>
<thead>
<tr>
<th>Assignment 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group construction of an artefact:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assignment 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A planned series of learning experiences in science and technology for a specific context:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group construction</th>
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</thead>
<tbody>
<tr>
<td>Group Presentation</td>
</tr>
<tr>
<td>Individual reflection</td>
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<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Brief description of context</strong></td>
</tr>
<tr>
<td>Five coherent and conceptually related teaching and learning experiences.</td>
</tr>
<tr>
<td>Theoretical justification</td>
</tr>
</tbody>
</table>

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# Learning and Teaching Schedule

<table>
<thead>
<tr>
<th>Tutorials</th>
<th>Learning Activities</th>
<th>Readings and other resources</th>
<th>Preparations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Simple Circuits</strong></td>
<td>The notes for this tutorial are called Simple Circuits and will be released on Thursday night so that the inherent discoveries will not be pre-empted.</td>
<td>Please come ready to spend the whole day in the Science lab area, upstairs in Building 23.</td>
</tr>
<tr>
<td></td>
<td><em>The wires, the bulbs, the motors, the batteries, the buzzers! How can we get all this to work together?</em> The tutorial will largely be an active immersive experience. The content of the first three tutorials are the basis for Assignment 1 which must be prepared in two weeks. The lectures have been placed on the web site to be viewed at any time. There will also be a short presentation at the end of each tutorial.</td>
<td>Review the Syllabus document and become familiar with the outcomes and content descriptors/indicators. Start looking for people with whom you can form a group for the first assignment. Do this on the first day!</td>
<td>Food service is limited in the Summer B period but there is a kitchen and a space to socialise with your group outside the lab.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What digital resources can you find that would support the teaching of these concepts? (eg <strong>Circuits</strong>)</td>
<td>Start your reflections now while you are completing the project.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Making simple machines.</strong></td>
<td>The notes for this tutorial are called The Cars. Make a collection of the tutorial notes. Written by Colin Webb, the original designer of the unit, they together form a practical Primary Science and Technology resource book. They will assist you to complete the assignments.</td>
<td>Groups for first assignment should be formed with students from your tutorial.</td>
</tr>
<tr>
<td></td>
<td><em>The Cars! Faster, further or funnier!</em> Can you make a model car from inexpensive materials? To what use could you and your class put such a car? How could model car be used for experimentation? How could your students design, conduct, document, record and interpret the experimentation?</td>
<td>Please look at <strong>ASSIGNMENTS FOR THIS UNIT</strong></td>
<td>Groups should be meeting and planning for assignment 1 in the breaks between the tutorials today.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What teaching resources can you find that you would be able to use in your classroom. (eg <strong>Formative Assessment</strong>) Have you looked at Scootle or TESAustralia? Please post the links to what you find and your opinion of the resource to the discussion site.</td>
<td>If possible learn how to use a soldering iron before this tut.</td>
</tr>
<tr>
<td>3</td>
<td><strong>Simple Circuits &amp; Machines Part 2</strong></td>
<td>The notes for this tutorial are called Applied in Context.</td>
<td>Book a presentation time with all of the names of your group.</td>
</tr>
<tr>
<td></td>
<td><em>A car with circuits? Coloured lights? An intersection?</em> This tutorial is a demonstration of the type of project that forms the basis of assignment 1. It will require your group to collaborate on the construction of a powered car and a set of traffic lights and then sequence the interactions between these models to simulate the real world.</td>
<td>What teaching resources can you find that you would be able to use in your classroom. (eg <strong>Formative Assessment</strong>) Have you looked at Scootle or TESAustralia? Please post the links to what you find and your opinion of the resource to the discussion site.</td>
<td>Look through the assignment checklist. Who will do what and who will back them up?</td>
</tr>
<tr>
<td>4</td>
<td><strong>Pet Leaves</strong></td>
<td>When the tutorials are over for the week please download and read Pet Leaves.</td>
<td>Please meet with your group in the breaks today. Have lunch together and move your project along to the stage where you all can see how and when it will be completed.</td>
</tr>
<tr>
<td></td>
<td><em>What can we learn from the life around us?</em> This tutorial gives an example of the type of concepts and content that could be the focus of the 5E learning experiences described in Assignment 2. The experiences will require the heightened use of student’s observation.</td>
<td>What opportunities are there to use the learning experiences from this tutorial to integrate experiences from other KLAs into your class curriculum? Please post your suggestions with your views on how such</td>
<td></td>
</tr>
</tbody>
</table>

348
<table>
<thead>
<tr>
<th>Tutorials</th>
<th>Learning Activities</th>
<th>Readings and other resources</th>
<th>Preparations</th>
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<tr>
<td>and sensory skills.</td>
<td>integration would work in a real classroom.</td>
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</table>
| 5 | **Flying machines**  
*Not a kite in sight! It’s all hot air! They’ll never work!* This tutorial asks students to explore the use of more refined construction techniques to create things that fly. It purpose is to further explore the classroom implementation of a community of Investigators. | • The teaching resource cards are called Flying Things.  
• The sequence of learning experiences covered in this tutorial will model what will be used in Assignment 2.  
• Where to next in the story of flight. How about Mars?  
• Paper Planes in now an Australian movie. How could you use this in your classroom? | • Are your personal reflections ready? Please see Phil if they are not.  
• What is your favourite flying thing? Bring it in and show us all how it works. |
| 6 | • Group preparation for presentation  
• Tutors will be available to assist students with their projects. Resources and tools will also be made available. This is an opportunity for groups who may have difficulties getting together at other times to meet and work in a supportive environment. | • Choose your presentation session during this tutorial.  
• The ‘other resources’ this time are in the Science lab. Please use this time to construct the artefact. It is not an opportunity for an early mark. It is a time to refine your design and to work together on what you will present in a week’s time. | • Arrange when you will meet to complete the project and how you will communicate.  
• Review the assignment checklist |
| 7 | • Group Presentations in Tutes  
*Now is the time to show us all what you have made!* Each group will have 15 minutes to set up and to complete all the requirements of the presentation as described in the assignment rubric. | • Have fun with this presentation time. Ham it up, be creative, don’t be boring but cover the content.  
• You will also be an audience for the other group’s presentations. In your feedback please be kind, be precise and be constructive. | • Individual Reflections due in at the time of the presentation.  
They can also be handed in at 9:00 am on the day following the presentation. |
| 8 | **White Powders**  
*Yucky or yummy? What was that I just tasted?* This tutorial is the first of two exploring kid’s chemistry through cooking. We will use an action research cycle to create the best tasting sherbet ever while looking for cross curriculum integration opportunities. | • The notes for the final two tutorials are called Bubbly Things. They will be available before the third week.  
• To prepare for assignment 2 students will need to have an idea of the concepts and the learning experiences they want to cover. They should draw on their practicum experiences for context descriptions. | • Now that assignment one is done, What’s next? Students should have looked at their school context and have begun to write descriptions of their school/class. |
| 9 | **Science and Technology… and Cooking**  
*The bubbles, the bubbles! Where do they come from?* This final tutorial draws on the scientific methodology we have been developing to challenge the students to develop their own investigation process rather than relying on a ‘recipe’ for the lesson. | • Cooking in schools has many links to other curriculum areas. Cooking is creative. Cooking promotes Health. Cooking in Science Week. Cooking needs Maths and English. Cooking provides cultural insights.  
• Share your thoughts on maintaining safe learning environments on the discussion board. | • The tutorials are done so now is the time to write that set of learning experiences. Please don’t be limited to what you have learnt in the tutorials. Follow the template but be creative in your teaching. |
Flipped Learning and Self-Regulated Learning Experiences in Higher Education: A Qualitative Case Study

HUMAN RESEARCH ETHICS COMMITTEE

28 October 2014

Associate Professor Carol Reid
School of Education

Dear Carol,

I wish to formally advise you that the Human Research Ethics Committee has approved your research proposal H10819 “Does the Flipped Learning Model support Self-Regulated Learning in the context of Higher Education?”; until 8 August 2015 with the provision of a progress report annually if over 12 months and a final report on completion.

Conditions of Approval

1. A progress report will be due annually on the anniversary of the approval date.
2. A final report will be due at the expiration of the approval period.
3. Any amendments to the project must be approved by the Human Research Ethics Committee prior to being implemented. Amendments must be requested using the HREC Amendment Request Form: http://www.uws.edu.au/__data/assets/pdf_file/0018/491130/HREC_Amendment_Request_Form.pdf.
4. Any serious or unexpected adverse events on participants must be reported to the Human Ethics Committee via the Human Ethics Officer as a matter of priority.
5. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the Committee as a matter of priority.
6. Consent forms are to be retained within the archives of the School or Research Institute and made available to the Committee upon request.

Please quote the registration number and title as indicated above in the subject line on all future correspondence related to this project. All correspondence should be sent to the email address humanethics@uws.edu.au.

This protocol covers the following researchers:
Carol Reid, Priyamлаsha Sanagavarapu, Adel Alamry

Yours sincerely

Professor Elizabeth Deane
Presiding Member,
Human Researcher Ethics Committee
Participant Information Sheet

**Project Title:** Flipped Learning and Self-Regulated Learning Experiences in Higher Education: A Qualitative Case Study

**Project Summary:**

This study will be concerned with the how the mode of instruction in this course can enhance students’ learning independence. You are invited to be part of this exciting study because of your enrollment in Introductory Early Education unit. You got the potentials to give us some insights of the way this course is being presented. This study is interested in how you perceive the Flipped Learning Model and how you manage your own learning. The Flipped Learning Model is basically taking lecture competent of the unit outside class time to allow more time for discussion and engagement between the students and their instructor. This study is also interested in your learning patterns and factors that may impact successful learning environment. The research’s methods will be used in this study are class-observation, group discussion, one-to-one interviews, reflective journal and online interactions.

Dear Student,

You are invited to participate in a study conducted by Adel Alamry, PhD student in the School of Education at the University of Western Sydney. This study is being sponsored by the Centre for Educational Research (SoE) at the University of Western Sydney.

You have been approached because you are enrolled in an introductory early education unit that implements the Flipped Learning Model. The Flipped Learning Model is an instructional approach in which the lectures are given outside class time in order to allow more time for class discussion and engagement between the students’ and their instructor.

You will be asked to participate in group discussions for three times during the term. Each group discussion meeting will be about a special topic. The first topic will be about your planning strategies to perform well in this unit and how to keep yourself motivated. The second topic will be about your ongoing learning experience. The third topic will be about your evaluation of your learning
performance as well as the evaluation of the course. Each group discussion will take 1-2 hour[s] and at the end of every meeting you will be given time for asking questions relevant to the study.

At the end of the term, you will be asked to participate in one-to-one interview with the researcher. In interview we will be discussing your personal learning development and whether this unit may have helped you achieved your expectations or not.

The group discussions and one-to-one interviews will be recorded upon your permission and they will be viewed only by the researcher.

You will also be observed occasionally during face-to-face and online interaction to determine the effectiveness of the learning environment of the unit and recognize any issues that might impact your learning experience. In class observation, I will observe your class performance in order to have a better understanding of the Flipped Learning Model and student’s learning independence. I will not intervene in your normal class activity and I will make my presence unnoticeable as possible.

In online observation, as the researcher, I will have access to your Learning Logs that will be recorded during your online activities during the course. This means, I will look for how many times and for how long you access the online materials related to the unit. I will also monitor learning tools that is most used during the course.

You will be asked to write reflective journals to record and reflect on your learning experience during the course. The reflective journal will take from 5-10 minutes to complete. You will be asked to complete at least three reflective journals.

Please be assured that only the researcher will have access to the raw data you provide. If you decide to participate, make sure that your participation will remain confidential. Your participation in this study is entirely voluntary.

This study will not cause any harm or discomfort to you and I will strive to create a friendly and comfortable environment during your participation. However, if you experience any discomfort during the study, please contact me immediately.

If you do not wish to take part of this study, your decision will have no effect on your academic status or relationship with the instructor. You can withdraw from the study at any time without giving a reason; however it will/may not be possible to withdraw the data you have provided. Instead your information will be removed so the data you provide will not be identifiable.

The information you provide will only be seen by the researcher and will be kept securely safe using UWS drive and will be removed after study completion.

The study results will be published in the University of Western Sydney database and no one will be able to identify you from this information. The data will be stored for a minimum of 5 years according to Australian Code for the Responsible Conduct of Research, and may be reported in academic conferences and journals. If you wish to receive a summary of the research results, I will be happy to arrange this with you once the study is completed.
If you are happy to participate please send me an email at a.alamry@uws.edu.au. In case you don’t want to participate then disregard this invitation. If you want any further information about the study please email me or use one of my contact information below.

If you have any concerns or complaints about the conduct of this study you should contact University of Western Sydney Human Research Ethics Committee that is nominated to receive complaints from research participants. You should contact the Human Ethics Officer via Telephone: 02 4736 0229 or e-mail: humanethics@uws.edu.au, and please quote (H10819).

Kind regards,

Adel M. Alamry
PhD Candidate
School of Education
University of Western Sydney
Building 22, Bankstown Campus
Email: a.alamry@uws.edu.au
Office: 02 9772 6029
APPENDIX D: PARTICIPANT CONSENT FORM
Flipped Learning and Self-Regulated Learning Experiences in Higher Education: A Qualitative Case Study

Participant Consent Form

Project Title: Flipped Learning and Self-Regulated Learning Experiences in Higher Education: A Qualitative Case Study

I, ____________________________________________________________________________________________, consent to participate in the research project titled “Does the Flipped Learning Model support Self-Regulated Learning in Higher Education?”

I acknowledge that I have read the participant information sheet and have been given the opportunity to discuss the information and my involvement in the project with the researcher to my satisfaction.

I consent to the following:

- [ ] Two one-to-one interview and for audio recording
- [ ] One focus group discussion and for audio recording
- [ ] In-class observations (2-3 times in the semester)
- [ ] Access to my online participation information (occasionally)
- [ ] Writing of short reflective learning journals

I understand that my involvement in the study is confidential and that the information gained during the study may be published, but no information about me will be used in any way that reveals my identity.

I understand that I can withdraw from the study at any time, without affecting my study in the unit and relationship with the researcher and instructor now or in the future.

<table>
<thead>
<tr>
<th>Consent and contact details</th>
<th>Demographic information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signed: ___________________________________________________________________________________</td>
<td>If you consent to participate in the study, please provide the information below;</td>
</tr>
<tr>
<td>Name: _____________________________________________________________________________________</td>
<td>Your Age: ____________</td>
</tr>
<tr>
<td>Date: ____________________________________________________________________________________</td>
<td>You are: Male □ Female □</td>
</tr>
<tr>
<td>Email: ___________________________________________________________________________________</td>
<td>First Year Student □ Second Year Student □</td>
</tr>
<tr>
<td>Phone: ___________________________________________________________________________________</td>
<td>International Student □ Domestic Student □</td>
</tr>
<tr>
<td></td>
<td>English □ Other □</td>
</tr>
<tr>
<td></td>
<td>Flipped Classroom is (New □ Not New □) to you.</td>
</tr>
</tbody>
</table>

Return Address: Center of Educational Research, University of Western Sydney, Bankstown Campus, Building 19

Note:
This study has been approved by the University of Western Sydney Human Research Ethics Committee (Ref: H10819). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Research Ethics Office on Telephone: 02 4736 0329 or e-mail: human.ethics@uws.edu.au. Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
APPENDIX E: FOCUS GROUP QUESTIONS
Focus Group Questions

First, I would like you to introduce yourself.

1. So could you please tell me your first name, and talk about yourself a bit?
2. How would you like me to address you? Do you have a nickname you would like me to use?
3. Who here is a local student and who is an international student? [For international students:] Where are you from?
4. Excellent. Before we begin, is there anything you would like to ask or know about from me?

Okay. Now I would like to ask you about your learning experience in this unit.

1. When you decided to take this unit, what were your expectations of the unit?

2. What steps did you take to understand the requirements of this unit?
   a. What is your view of the weekly learning goals and tasks?

3. As you know, this unit is using the flipped learning (FL) approach as a mode of instructional delivery.
   a. How have you found the learning experience in the FL approach of this unit? (What do you think of FL in this unit?)
   b. In what ways do you think that the design of this unit has helped you to be more independent in your learning? (Does this unit help you to learn on your own?).
c. How is this unit’s delivery different to other units you have taken in your course?

d. To what degree has the FL approach helped you to engage with the unit materials more deeply? How so?

e. How would you describe your personal learning style, and to what extent do you think your learning style fits within this FL environment?

4. In the FL approach certain responsibilities for learning are assigned to the instructor, and others are assigned to the students. Being a student in the FL context:

   a. What do you expect your instructor’s role to be?

   b. What do you expect your role (as a student) to be?

   c. How do the instructor’s and students’ responsibilities and roles overlap and work together to benefit your learning?

   i. Can you give an example?

5. I understand that the learning materials are available on the unit website. These materials include: weekly overview videos, presentations, worksheets, and the compulsory reading list.

   a. How often do you access the unit’s learning materials?

   b. How do you manage your weekly workload in this unit?

   c. What are the things that help your independent learning in this unit?

   d. What are the barriers that slowed down your independent learning in this unit?
6. Have you encountered any technical problems during the online portion of this unit?
   a. To what degree have these problems [assuming there are any] impacted on your engagement?
   b. What were your reactions to these problems?

7. As you know, there are two aspects to instruction in this unit: online activities and face-to-face classroom discussions. How do the face-to-face and online weeks blend together in this unit?
   a. Do you have a preference for one or the other? Why?
   b. How do you manage (organise) the transition from individual online learning and interpersonal class learning?
   c. To what degree does your weekly workload change between the online and face-to-face weeks?

Is there anything else you would like to add? Any questions?
APPENDIX F: IN-DEPTH INTERVIEW 1 QUESTIONS
In-depth Interview 1 Questions

1. How have you been progressing in the unit since the last time we talked?
   a. Have there been any changes to your learning strategies? Why?

2. I understand that you have submitted your first assignment in this unit. First, I would like to know a little bit about the assignment.
   a. What was the assignment about, and why did you choose this topic?
   b. How did you feel about the assignment? (How confident did you feel about doing this task?)
   c. What standards did you impose on yourself to do the assignment?
   d. What do you think the purpose of this assignment was?

3. How did you plan for your essay writing?
   a. When did you start? (If late, then why?) How much time did you devote to writing this essay?
   b. What steps did you set for yourself to complete the assignment?
   c. What resources did you use?
   d. Did you look at some examples of Assignment 1 that are available on the unit website? Was it useful? Why?
   e. How useful were the other resources on the unit website for your essay preparation?

When you were in the process of writing your essay…
4. Did it turn out that the plans you made for writing the essay were realistic? Why?
   a. What challenges/frustrations/issues/distractions did you face?
   b. How did you control these challenges/frustrations/issues/distractions?
   c. How useful were the resources available to you?

5. What sort of adjustments (if any) did you make in order to complete your essay? Did you alter your standards, strategies, or timetable?

6. What did you do to keep yourself motivated in order to complete your essay?

7. What did you do to make sure your essay meets the requirements?

As I understand it, you have now finished and submitted your assignment.

8. How do you evaluate your performance in this assignment? Why?

9. What are your feelings about the effort you put in this assignment? Why?

10. Can you tell me the factors that you think helped or hindered your performance in this assignment?

11. What grade do you expect to get for this assignment? Why?

12. If you were given the chance to redo this assignment, what would you do differently?
a. How do you think you can improve your future learning plans?

b. Do you feel this unit prepared you for this assignment?

Would you like to add anything about your learning experience with respect to Assignment 1?
APPENDIX G: IN-DEPTH INTERVIEW 2 QUESTIONS
In-depth Interview 2 Questions

1. How have you been progressing in the unit since the last time we talked?

2. How did the flipped learning (FL) approach change the way you learned in this unit? (How has your understanding about your learning changed?)
   a. Did you learn how to learn in this FL context? How? (What do you understand about your learning? Did the FL approach help? How?)
   b. How much time did you spend on this unit compared with other units?

3. Can you describe to me what aspects of the FL approach in this unit helped you to be more self-disciplined and committed to your learning? Did you have any difficulties in being self-disciplined?
   a. What was the most rewarding experience for you to learn on your own?
   b. What were the issues that you struggled with being an independent learner?

4. How did you find the transition from your earlier education experiences into this unit?
   a. What were the differences and similarities?

5. After completing this unit, what overall grade do you expect to receive? Why?
   a. Do you think the FL approach has had an impact (positive or negative) on your academic performance in this unit?
APPENDIX H: LEARNING LOG 1
Learning Log 1

Thank you for giving the time to write your Week 3 learning log in XXXXXX XXXX Unit. To better understand the impact of this unit design on your learning, please read the following questions and give brief answers.

1. What are your goals for Week 3? Goals based on Week 3 tasks and requirements (e.g., reading, online activities, essay drafting).

2. What sort of plans/strategies do you have in your mind to accomplish these goals?

3. What sort of resources do you need, or concerns/questions you have for your learning in this week?

4. Before starting assignments, what are your expectations about your performance in this week?
APPENDIX I: LEARNING LOG 2
Learning Log 2

Thank you for giving the time to write your learning log 2 in XXXXXX XXXX Unit. In this log, I am interested to know how did you deal with Assignment 1. Please be as descriptive as you can, to capture your feelings and the learning experiences you had in order to complete Assignment 1.

1. What did you do to understand and complete Assignment 1 (e.g., preparation and planning)?

2. Please list the strategies that you used to complete this assignment. What strategy/strategies did work for you the most?

3. While doing Assignment 1, what sort of difficulties did you face? What did you do about them?

4. How did you keep track of your progress in completing Assignment 1? What did you learn from this experience?
APPENDIX J: LEARNING LOG 3
Learning Log 3

Given the fact that this unit does not have traditional lectures, this assigns learning responsibility to the students to take charge of their own learning. Drawing on your performance in the assignments, online materials, and tutorials please reflect on:

1. What you have learned about yourself as a learner, by explaining your strengths as well as the areas that you need to work on (weaknesses)?

2. To what degree did you become an independent learner in this unit? What aspects helped or could have helped you to gain learning independence?

Note: rather than describing events and situations, please focus on the effect the flipped learning experience has had on you, the effect on your learning that has occurred, and the effect on your future learning.
## APPENDIX K: SUMMARY OF FINDINGS: FORMS OF SELF-REGULATED LEARNING

<table>
<thead>
<tr>
<th>Motivational strategies</th>
<th>Task value</th>
<th>Expectancy: Control of learning beliefs</th>
<th>Expectancy: Expectancy for success and self-efficacy</th>
<th>Assessment anxiety</th>
</tr>
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<tbody>
<tr>
<td>Goal orientation: Intrinsic and extrinsic</td>
<td>Almost all participants actively evaluated the personal value of each task in the unit. 60% of the participants identified the ‘practical’ value of tasks for future careers. But 60% questioned the ‘practical’ value of some of the assessments. All participants strategically weighed unit tasks against their other personal or professional activities.</td>
<td>30% of participants felt their personal effort determined their academic performance. 25% believed that their academic performance was almost entirely dependent on the instructor. The remainder held that it was a mix of personal effort and instructor effort that determined their academic performance.</td>
<td>55% of participants expressed high levels of self-efficacy and felt that they were able to do well in the assessment tasks. 45% expressed lower levels of self-efficacy, which was often explained in terms of factors such as language difficulties or lower academic abilities. However, self-efficacy levels of some of the learners changed over time – some increased and others decreased with progressive experience of the assessment tasks or as other commitments impinged on them.</td>
<td>Assessment anxiety was expressed by all participants, but was mostly due to workload pressures or meeting deadlines. 20% of the participants regarded such anxiety being a motivator that had a positive impact on their learning.</td>
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<tbody>
<tr>
<td>Motivational strategies</td>
<td>Memorisation was hardly used as a strategy by any of the participants. 15% of the participants regarded online quizzes as useful in this regard.</td>
<td>40% of participants utilised different types of resources – such as TAFE material, YouTube, prior university units, unit learning material – and integrated the content into their assignments.</td>
<td>70% of participants used simple organisational strategies such as note-taking for videos and essay plans. 35% reported using relatively more complex methods of organisation, such as detailed diaries or the use of mind-maps for organising their ideas.</td>
<td>40% of participants always attempted to incorporate critical and original thinking into their work. However, some participants were not consistent in this and others lacked the willingness and/or confidence to think critically.</td>
<td>All students were engaging in a variety of strategic planning activities for the semester’s work as a whole, and for individual assignments.</td>
<td>65% of participants said they had used at least one of the unit’s online tools to ensure they were on track in terms of meeting both the completion dates and the required standards. The learning guide was most commonly used.</td>
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Flipped Learning and Self-Regulated Learning Experiences in Higher Education: A Qualitative Case Study

<table>
<thead>
<tr>
<th>Resource management strategies</th>
<th>(50% of participants). 35% of participants appear not to have systematically used the online unit materials to monitor their progress.</th>
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<tbody>
<tr>
<td>Metacognitive self-regulation: Regulating</td>
<td>Some participants reported self-reviewing their work and making changes based on identified ways in which it could be improved. 20% of participants reported reviewing their work in stages. 20% said the online quiz was an important tool for checking their learning and identifying areas where additional work is needed. Only 5% indicated that seeking feedback on draft assignments was part of a regulating strategy.</td>
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<tr>
<td>Time management</td>
<td>75% of participants used some kind of strategy or method to managing their time and ensuring deadlines were met. 50% set aside specific blocks of time to work on assignments, or allocated particular days of the week to work on their studies. 15% used of specific systems for prioritising their assignments. 15% used strategies in which involved working on a task in piecemeal fashion. However, 50% of participants often left work to the last minute due to workload pressures, or as a deliberate motivational strategy.</td>
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<tr>
<td>Environment management</td>
<td>35% of participants indicated that they were conscious of the type of environment that they needed in order to promote effective studying, and that they took steps to ensure this. 10% reported that they needed activity around them or background music. 25% indicated they could find a distraction-free environment. 10% faced difficulties in securing a suitable study environment at home and either did their work at the university whenever possible, or worked at night when there were fewer distractions.</td>
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<tr>
<td>Effort regulation</td>
<td>50% of participants described various ways in which they regulated their effort, particularly when facing the pressure of an assignment deadline. For 30% this involved avoiding distractions, for example by physically moving themselves to a less distracting environment or by turning off their phone.</td>
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<tr>
<td>Peer learning</td>
<td>60% of participants preferred collaborative or classroom-based learning, however, the unit provided few opportunities for collaborative and peer learning due to the limited amount of classroom time. Also, participants made very little use of the available online facilities for peer learning.</td>
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<tr>
<td>Help seeking</td>
<td>15% of participants asked questions of the teacher either during tutorials or by email. 25% sought help from peers. Very little use was made of the discussion boards. 25% used family members or friends to check their work, especially where they had relevant experience. 30% of participants, especially those whose first language is not English, used editors/proof-readers available at the university.</td>
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### APPENDIX L: SUMMARY OF FINDINGS: FACTORS THAT INFLUENCE SELF-REGULATED LEARNING

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<tr>
<th>Factors that Influence Self-Regulated Learning in the Flipped Learning Model</th>
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<tr>
<td><strong>Learning styles and behaviours</strong></td>
<td>35% of participants classified themselves as independent learners. These participants reported that the FLM helped them to engage with and understand the material better compared to traditional classroom instruction. They highlighted the benefits of self-paced study. They engaged more comprehensively with the online material. However, 60% of participants deemed the FLM to not suit to their personal learning style. Reasons for this included: lack of self-motivation, a preference for social interaction, and a preference for teacher-led methods of learning. 15% emphasised the importance to them of face-to-face peer interaction.</td>
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<tr>
<td><strong>Skills and abilities</strong></td>
<td>For 35% of participants, English was a second language. These participants remarked on the difficulties they face in learning independently, especially for the comprehension of texts. 25% of participants for whom English is a first language also reported that they struggle with reading and writing skills when working independently. 80% of participants commented on the difficulties of managing their workloads. 35% identified poor time management skills or an inability to concentrate (avoid being distracted).</td>
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<tr>
<td><strong>Influence of personal differences between students</strong></td>
<td>45% of participants struggled to stay motivated. Non-independently learners seem to need the support of a tutor and classmates to feel motivated. Several participants said the unit’s content overlapped with already-completed diploma courses, which was de-motivating. Low motivation in class had a cascading effect: low levels of motivation and engagement of peers resulted in low levels of participation and interaction in others.</td>
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<tr>
<td><strong>Levels of interest and motivation</strong></td>
<td>40% of participants reported ways in which family commitments, travel time, and jobs constrained the time available for study and placed uncomfortable pressure on them.</td>
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<tr>
<td><strong>Time constraints and other commitments</strong></td>
<td>15% of participants reported having prior experience of the FLM, which helped with developing self-regulated learning abilities. The remainder were not familiar with the FLM. 25% of participants had enrolled in the unit without being aware that it would be delivered on a flipped learning basis, or without fully understanding what this would mean. Of these, 25% reported not changing their study strategies either because they worked well or because of habituation. 25% of participants reported developing new learning strategies in response to the novelty of the FLM, which included increased motivation, an enhanced sense of personal responsibility, improved independent learning abilities and research skills, and better time management. 65% of participants identified various organisational skills or learning strategies for working independently on an assignment in particular.</td>
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<tr>
<td><strong>Familiarity with flipped learning</strong></td>
<td>Although 40% of participants were positive about some aspects of the unit, only 20% were very happy with the overall structure of the unit and thought the elements were well aligned. 30% regarded the structure as being ineffective, arguing that there is too much independent</td>
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<tr>
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<tr>
<td>Role of teachers</td>
<td>55% of participants emphasised the important role that teachers play in any learning situation, including a FLM. 50% were mildly positive about the standard of instruction received. 50% were quite critical of the instruction received, which they saw as disjointed and misaligned with their assignments. These students felt that classroom teaching failed to support their independent learning activities.</td>
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<tr>
<td>Unit content and materials</td>
<td>15% of participants indicated that various features of unit resources impacted on their self-regulated learning. 80% were in some way critical of the materials and indicated that they hindered rather than helped them to learn. For some participants, this related to their weak language skills. Others expressed the view that the online resources were not adequate for the purpose of their assignments and that they were forced to find other materials. 30% of indicated that the unit was overly ‘theoretical’ and insufficiently ‘practical’.</td>
</tr>
<tr>
<td>Assessment methods</td>
<td>5% of participants deemed the assessment methods and criteria clear, enabling regulation of performance. 30% reported difficulties in understanding the assessment methods or criteria, which had an impact on their ability to work effectively towards their goals. 55% regarded the assessment methods as unfair, due to the perceived subjectivity involved in marking, or the differences compared to other units.</td>
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<tr>
<td>Technological aspects of program delivery</td>
<td>Some participants did report that they had experienced problems in using the flipped learning IT system, which had been a source of frustration for them but had not had a major negative impact on their work. But only 10% of participants stressed necessity of access to appropriate IT, which may not be suitable for all students who would require others means of accessing unit material. 5% identified the FLM as being aligned with the needs and preferences of ‘the younger generation’.</td>
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Ways that Self-Regulated Learning is Developed or Shaped by the Flipped Learning Model

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<tr>
<th>Element</th>
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<tr>
<td>Ways that the flipped learning model fosters self-regulated learning</td>
<td><strong>Independent learning and critical thinking</strong> 65% of participants said the FLM gave them the opportunity to learn and discover things for themselves through the online unit materials and other sources. But 10% argued the FLM hindered critical thinking because of the limited opportunities to find out about different views and perspectives in a classroom situation.</td>
</tr>
<tr>
<td>Ways that the flipped learning model fosters self-regulated learning</td>
<td><strong>Engagement in learning</strong> 30% of participants felt more engaged in their learning and overall felt they learned more effectively in the FLM. Several said that the FLM encouraged more engagement with a variety of texts, and when studying independently, resulted in more focused and wider ranging research, and thus a better understanding of the material.</td>
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<tr>
<td>Ways that the flipped learning model fosters self-regulated learning</td>
<td><strong>Flexibility in place and time of learning</strong> 55% identified flexibility as an important benefit of the FLM because it gave greater control over the learning environment, timing, and enabled greater control over resource management. Several participants stressed the value of being able to decide when and where to work on different components of the unit, which enabled them to manage their time better and to reinforce their learning by going over earlier material and using this for later assignments.</td>
</tr>
<tr>
<td>Ways that the flipped learning model fosters self-regulated learning</td>
<td><strong>Follow-up on progress</strong> 75% of participants regarded the structure of the unit as not providing a suitable mechanism for following up on progress, and that this had a negative impact on their learning without sufficient support, and not enough face-to-face instruction time.</td>
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<tr>
<td>model hindered self-regulated learning</td>
<td>motivation to complete work. Some participants were confused about the structure and whether they were ‘on the right track’.</td>
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<tr>
<td>Support and guidance</td>
<td>75% of participants perceived a lack of support and guidance from their tutor which hindered their learning or understanding of material. This was reported by participants with collaborative and independent learning styles.</td>
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<tr>
<td>Engagement and collaboration with peers</td>
<td>Many participants expressed the view that the FLM was not a collaborative learning environment. Participants who preferred a collaborative learning style expressed concern about the lack of opportunities for more peer learning. However, even for independent learners, low levels of student engagement and participation in the classroom sessions were perceived to be a major factor influencing their overall experience of the unit and ability to learn effectively in it.</td>
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