Flipped Classroom: Students' Cognitive Needs of Relatedness, Competence, and Autonomy in a Fully-Flipped Program

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Abstract

This study examines how the flipped classroom approach to teaching and learning supports or inhibits the cognitive needs of relatedness, competence, and autonomy, leading to either increased or decreased levels of motivation. We use semi-structured interviews involving twenty-two students and five facilitators in an Australian university to qualitatively investigate perceptions of motivation through the lens of self-determination theory (SDT). Using thematic analysis, our findings reveal that the flipped classroom approach supports students' cognitive need for relatedness by providing more opportunities for interaction in the classroom. Further, relatedness has been shown to facilitate internalisation and support competence as a result of students supporting each other. However, our findings demonstrate that despite overall satisfaction with the flipped learning environment, the students raised concerns about how the learning is executed. Among recommendations for pedagogical practices, academics and education providers are urged to create an environment that supports a sense of belongingness and self-endorsement of learning activities among students to promote more autonomous forms of motivation.

Practitioner Notes

1. Relatedness has been shown to facilitate internalisation and support competence as a result of students being able to support each other through connections made in the classroom extending outside the class to support peer to peer learning.
2. Guiding students to see the importance of an activity for their career or goals is likely to facilitate internalisation, whereas completing an activity merely to fulfill a course requirement will not result in self-determination.
3. Educators should be aware that student motivation is influenced by the length of videos, provision of reading or notes to supplement videos and consequences of not completing the pre-class activities.
4. Facilitators' decision to repeat pre-class materials in the class creates a behavioural response from students and this should be avoided to send a consistent message.
5. Learning resources or assessments should be personalised as social context or familiarity with the learning resources is shown to enhance student motivation.

Keywords

flipped learning environment; motivation; active learning; student cognition.

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Introduction

The global higher education landscape continues to face growing pressure from multiple sources. Factors that continue to put pressure on universities are (i) increased government funding constraints (e.g., Martin-Sardesai et al., 2021), (ii) new forms of competition where universities no longer control the information which is available to learners through massive open online courses (MOOCs) (DiRienzo & Lilly, 2014), and (iii) a new generation of students with diverse needs and backgrounds (Holmes et al., 2022; Organisation for Economic Co-operation and Development [OECD], 2017). Challenges in the current teaching and learning environment have become especially acute during the COVID-19 pandemic (Carnegie et al., 2022). As the delivery of higher education is linked with student satisfaction (Tho, 2017), adequate innovation in teaching practices is a key requirement to remaining competitive in the current environment.

Blended and flipped learning modes are viewed as a solution to current challenges higher education faces for two reasons. Firstly, the flipped classroom has been identified as a student-centered approach allowing students to complete online modules in their own time and at their own pace (Mingorance, et al., 2019) and the

attainment of such flexibility is viewed as a means of attracting students (Sora, 2001). Further, this provides opportunities for educators to use the classroom time for collaborative and active learning (Wanner & Palmer, 2015). Secondly, blended and flipped models appear attractive to higher education administrators due to their cost-saving potential as some aspects of teaching and learning can be provided with minimal human contact (Oerther, 2017). Development of online learning resources can be time-consuming (Oerther, 2017), however, once the online modules are developed they can be delivered to a large number of students over different periods without the occurrence of additional delivery costs (O'Flaherty & Phillips, 2015).

As time spent on blended instructions often comes at the cost of research activities, efforts from universities to adopt new teaching modes continue to put pressure on academics in managing their workload (Samkin & Stainbank, 2016). Prior studies have reported increasing tensions on teaching and research-related activities among academics in the UK (Smith & Urquhart, 2018), Australia (Steenkamp & Roberts, 2020), Norway (Kyvik, 2013), and Netherlands (Leišytė, 2016). A recent study reported that academics perceive designing and implementing online learning activities and materials as a significant source of pressure (Steenkamp & Roberts, 2020). Despite academics' preference for traditional teaching methods, the use of blended learning approaches continues to gain popularity (Frick et al., 2020; Lage et al., 2000). Therefore, the current focus of this trend has shifted to understanding how the use of technology-mediated learning is affecting student outcomes (Becker et al., 2017).

Despite the recent rapid uptake in universities of the flipped and blended learning approaches, research on the flipped classroom is still in a nascent stage (Steen-Utheim & Foldness, 2018; Williams et al., 2019) and it is under-evaluated, under-theorised, and under-researched (Abeysekera & Dawson 2015; Li et al., 2021). Academic studies that investigate the large-scale implementation of the flipped classroom across multiple courses as opposed to the individual course as the unit of analysis are non-existent (Akçayir & Akçayir, 2018) and studies in the accounting discipline remain few (e.g., Brown et al., 2016; Frick et al., 2020; Lento, 2016). This dearth of research is surprising, given how technological advances have contributed to the rapid rise of the flipped classroom approach in higher education (Chen et al., 2016).

The flipped classroom is perceived to foster student engagement and active learning through preparatory work (O'Flaherty & Phillips, 2015) and the role of the educator is to mediate students' ownership of their own learning and self-regulative skills in the classroom (Steen-Utheim & Foldness, 2018). Therefore, students require increased motivation in the flipped environment as they need to self-initiate study before attending the class and are expected to be active participants in sharing, understanding, and constructing new knowledge (Damsa et al., 2015). Students' motivation can be an outcome of their learning environment, which can either support or inhibit the satisfaction of their basic cognitive needs, leading to higher or lower levels of motivation (Deci & Ryan 2008). Evidence on student motivation in a flipped learning environment is scarce and generally limited to quantitative analysis of student surveys and standalone interventions i.e., a single course (e.g., Sergis et al., 2018; Yoon et al., 2020; Zamzani & Perera, 2019). Chuang et al. (2018) identified that motivational factors might play a key role in the success of the flipped classroom indicating that learners with a high level of motivation benefit the most from the flipped classroom. However, they did not provide insight on whether the flipped classroom effects the motivation of learners. Therefore, this study aims to understand how the

unique setting of a fully-flipped program supports or inhibits the cognitive needs of relatedness, competence, and autonomy, thus leading to increased or decreased levels of motivation. Specifically, focusing on self-determination theory (SDT), we ask:

Research Question: How does the flipped classroom environment support (1) students' need for competence; (2) students' need for autonomy; (3) students' need for relatedness; and how does this support affect students' motivation levels?

As has been documented in the literature, the flipped classroom requires substantial student effort to complete pre-class work (highlighting the role of motivation) (Chen et al., 2014). Thus, our focus on the role of students' cognitive needs in supporting motivation offers new and valuable insights into this new approach to teaching and learning. We offer insight into the following areas: (1) large-scale implementation of the flipped classroom across multiple courses (the importance of which is identified by Akçayir & Akçayir [2018]); (2) instrumental learners and how teaching can support more expressive forms of learning (Ottewill [2003] calls for this less instrumental and more expressive approach to learning and teaching), and (3) the related role of personal and contextual factors (an issue identified by Lee & Shute [2010]). This research redresses the "under-theorisation" of the flipped classroom approach highlighted by Abeysekera & Dawson (2015) and Li et al. (2021). We propose that to facilitate pedagogically the transition from a passive to an active learning environment requires focus on the three basic psychological needs of competence, autonomy and relatedness (identified in SDT), individual dispositions (interest), and environmental factors. This assessment of the flipped learning environment is both relevant and timely in potentially enhancing student learning outcomes.

This paper is organised as follows: we begin by examining the relevant literature and then presenting the theoretical framework. Afterwards, we outline the research methods including the context of the research setting followed by our results. We then discuss the research findings and limitations before providing a conclusion.

Literature

The body of empirical research examining the environments of blended learning or the flipped classroom in accounting education continues to be in its infancy, with only a handful of studies focusing on the assessment of these teaching and learning approaches. Flipped learning is a pedagogical approach in which information delivery moves from the group learning space to the individual space are often facilitated by online digital tools such as pre-recorded lectures and interactive videos (Fisher et al., 2021;). Interestingly, researchers see flipped learning as a form of blended learning as it involves a combination of face-to-face and online components (Garrison & Kanuka, 2004). Thus, the extant literature on blended learning is highly relevant to flipped learning and we refer to literature on blended learning in this paper.

Most of the existing research assessing the effectiveness of the flipped classroom or blended learning models compares a blended format to traditional modes to examine the effectiveness of such a format in improving student engagement and learning achievement (Fortin et al., 2019; McCarthy et al., 2019) and focuses on students' perceptions or satisfaction with the course in general and with the online resources in particular (Brown et al., 2016; Osgerby, 2013). For example, Frick et al. (2020) report that a blended learning model enhanced students'

engagement, as measured by participation and concentration in a large lecture class. D'Aquila et al. (2019) report that instructor-generated videos are associated with improved performance in both traditional and blended learning environments. Lento (2018) found engagement with online homework resources was positively associated with performance in the final exam. However, the focus on the outcome (exam performance), as opposed to the learning process, provides little guidance for educators who wish to understand how the blended learning environment enhances student engagement.

Most of the research on flipped learning in the higher education literature has focused on the learner and content (Hao, 2016; McNally et al., 2017) and on the learner and technology (Wieling & Hofman, 2010; Williams et al., 2012), while important areas such as the learner and learning support (which refers to the support a student receives from other peers and the institution) have not been examined in detail (Wang et al., 2015). Chuang et al. (2018) investigate individual characteristics that might affect learning outcomes in a flipped classroom, reporting that learners with a high level of motivation benefit the most from the flipped classroom. Chuang et al.'s (2018) study extends the literature by suggesting that motivational factors might play a key role in the success of the flipped classroom; however, their findings offer little insight into whether the flipped classroom has any effect on learners' motivation, a gap that the present study explores.

Hao (2016) reports that although students appreciate the student-centered approach of the flipped classroom, they complain about the extra time required to complete the pre-class tasks, which highlights issues around student motivation also reported by other studies (e.g., Akçayir & Akçayir, 2018; Awidi & Paynter 2019). Whilst Sergis et al. (2018) and Zainuddin and Perera (2019) reported that the flipped classroom supports the basic psychological needs of SDT, the interconnectedness between these psychological needs and the resultant impact on motivation is not considered. The present study extends this literature by examining how the fulfilment of three cognitive needs and the interconnectedness between these needs enhances student motivation in the flipped learning environment. Focusing on the relationships between the learner and multiple subsystems, including peers (learning support), facilitator, content, and technology, this study sheds light on the effect these subsystems have on student motivation in the context of the flipped classroom.

Most studies on the flipped classroom focus on only one unit delivered using the flipped classroom approach, and there is a need for research to examine the large-scale implementation of the flipped classroom across multiple units (Akçayir & Akçayir, 2018). In fact, Wanner and Palmer (2015) warned of an increased workload for students if all their classes employed flipped learning. These researchers also reported academics' preference for a traditional teaching mode over flipped or blended learning modes because of the extra time requirements involved in preparing and managing, which undermines their research output. Similar evidence related to the resistance of educators to embrace new educational technologies has emerged (Watty et al., 2016). To address this, this is the first study to focus on a tertiary environment in which the faculty has fully embraced a flipped learning environment and in which all the courses are flipped.

Theoretical Framework and Self Determination Theory (SDT)

The theoretical foundation of the flipped classroom is based on an active learning process. It is believed that cognitive development is an active process as opposed to a passive process. For

example, Vygotsky (1978) argues that cognitive development is fostered by collaboration with others, whereas Piaget (1967) highlights the importance of individual space in learning while acknowledging that interaction with peers can benefit cognitive growth. The flipped classroom is considered an inverted classroom in which the events that traditionally occurred inside the classroom now occur outside the classroom and vice versa (Lage et al., 2000).
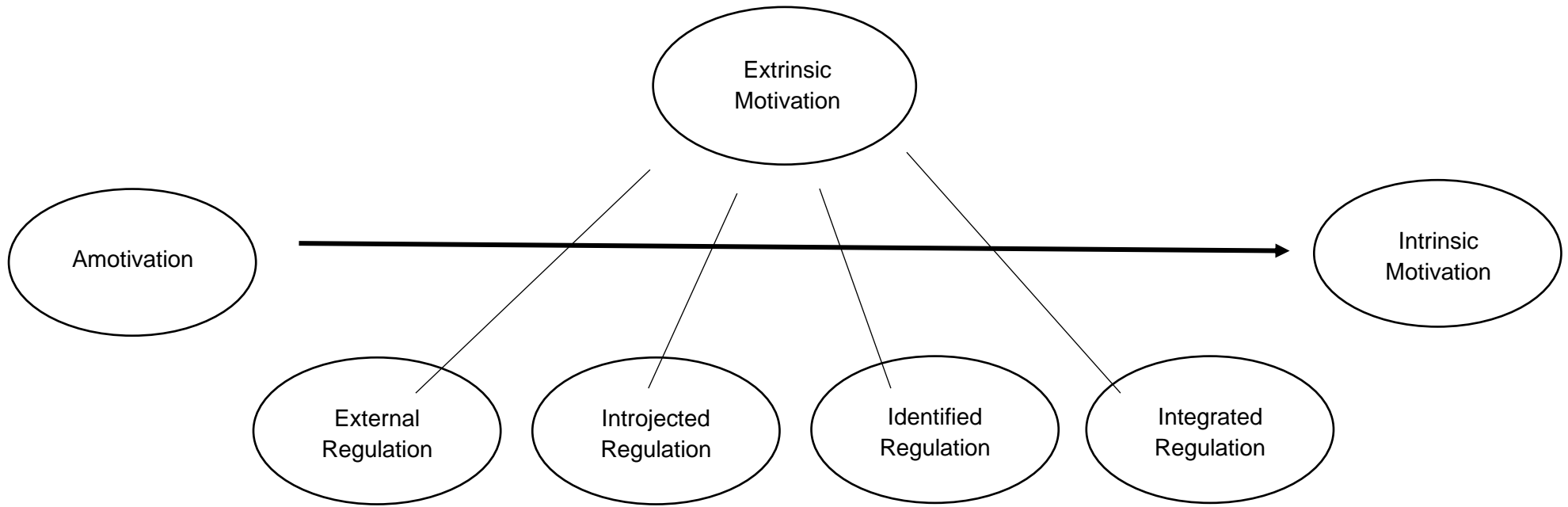
Given the theoretical foundations used for justifying the flipped classroom and the present study's focus on the role of social factors in cognitive development, this study employs SDT, which proposes that student motivation is an outcome of the learning environment, whereby the learning environment either promotes or impedes satisfaction based on cognitive needs (Deci & Ryan, 2008). SDT identifies three basic cognitive needs: relatedness, competence, and autonomy. Relatedness relates to the attainment of social skills and behaviours; competence relates to feelings of mastery of knowledge; and autonomy relates to feelings of control and independence (Abeysekera & Dawson, 2015).

Cognitive evaluation theory (CET), which is a subset of SDT, argues that learning activities and structures (i.e., feedback, rewards, interpersonal communication) that conduce to feelings of competence can enhance intrinsic motivation by satisfying the basic psychological need for competence. CET further argues that a feeling of competence will not enhance motivation unless it is accompanied by a sense of autonomy (De Charms, 2013; Ryan & Deci, 2000). Prior research has shown that extrinsic rewards can undermine intrinsic motivation (Deci, 1971; Lepper et al., 1973). However, SDT argues that extrinsic motivation exists in different forms and can vary greatly in the degree to which it is autonomous. To deal with this varying degree of extrinsic motivation and autonomy, SDT proposes fostering internalisation and integration of values (Deci & Ryan, 1985).

The process of internalisation and integration refers to a process by which individuals accept a value or regulation and fully transform this value or regulation into their own (Ryan & Deci, 2000). This has been explained via a continuum to describe how an individual's motivation can range from amotivation or unwillingness to passive compliance or to active commitment (see Figure 1). A little further along the continuum (just after amotivation) is a category referred to as "external regulation", which represents the least autonomous form of extrinsic motivation. Individuals typically experience this behaviour as a controlling activity or task, and it is completed only to satisfy an external demand. Another type of extrinsic motivation is referred to as "introjected regulation", which is still quite controlling because people perform the activity or task to avoid guilt or anxiety. Next on the continuum is a more autonomous form of extrinsic motivation, which is known as "identified regulation". In this form of extrinsic motivation, an individual identifies the importance of a particular behaviour and thus accepts its regulation as their own. Finally, the most autonomous form of extrinsic motivation is referred to as "integrated regulation", in which regulation has been fully assimilated into the self.

In relation to the cognitive need for relatedness, given that extrinsically motivated behaviours are not inherently stimulating, if a student can form a connection with peers or the facilitator, the student will be more likely to exhibit behaviours that are valued by significant others in the flipped learning environment. This suggests that creating a sense of belongingness or relatedness is critical to facilitating internalization.

Figure 1: Cognitive evaluation theory

Adapted from Ryan and Deci (2000)

202 # Research Method

203 **Research Context**

204 The research context of this study is learning in a tertiary business management and accounting
205 degree. The key learning challenge with students in business and management students is their
206 well-documented excessively instrumental approach toward learning. For example, a country-
207 wide survey conducted on behalf of the Open University Business School concluded that
208 "students today, in business, management, and accountancy, present problems for their teachers
209 beyond those that have always been present … there are problems of motivation" (Business
210 Education Support Team, 2002, p. 2). Research has shown that intrinsic motivation is a key factor
211 for art and creation (Stanko-Kaczmarek, 2012); however, the strongest motives for participating
212 in higher education for business students are associated with job prospects and higher pay (Lucas
213 & Tan, 2013), which represent extrinsic motivation. Several factors have contributed to this
214 problem, including the increasing emphasis on universities' contribution to economic production,
215 the emergence of vocational discourse in higher education, and the employment of instrumental
216 teaching approaches (Ottewill, 2003).

217 The educators are employed in teaching-focused only roles and their performance is attached to
218 teaching outcomes and innovation in teaching as opposed to research outcomes. This is expected
219 to overcome the challenges of instrumental teaching that are present in the traditional university
220 environment, in which performance goals primarily relate to journal publications and research is
221 valued far more than teaching (Duff & Marriott, 2017; Khosa et al., 2020). All the subjects in the
222 program under research are delivered in a flipped learning mode. The classrooms are designed
223 to suit the flipped learning mode, that is, they have student-centered seating arrangements,
224 multiple screens, easily moveable furniture, and portable whiteboards; all of which are conducive
225 to collaboration and discussion. A wide range of participative approaches, including gamification,
226 problem-based learning, business simulations, and industry-engagement activities are employed
227 to foster deeper learning and teaching. Student assessments comprise at least 50 percent of in-
228 class and homework activities in all subjects. This large-scale implementation provides a unique
229 setting for an investigation and by providing empirical evidence on the effect of pedagogic and
230 associated aspects of teaching and learning on instrumental attitudes, this study fills a largely
231 unaddressed gap in the literature.

232 **Research Design**

233 Literature The present study examines undergraduate business students in an Australian
234 university. The study was conducted in 2019 in two stages: Stage 1 administered online surveys;
235 Stage 2 administered semi-structured interviews. This project was approved by the (organisation
236 deidentified) Ethics Low Risk Review Committee.

237   Stage 1 online surveys were explorative and aimed at building knowledge regarding the research
238   context and to gain an understanding of the factors that influence learning experiences in flipped
239   classrooms. Stage 1 survey results were used to inform the questions developed for the
240   interviews conducted in Stage 2. To develop better understanding of student motivation and how
241   it influences student behaviour, Stage 2 involved conducting face-to-face interviews, with
242   questions drawn from both survey findings and existing literature based on SDT. For example,
243   the interview questions were informed by prior evidence on motivation (Abeysekera & Dawson,
244   2015; Ryan & Deci, 2000); personal and situational interest (Rotgans & Schmidt, 2017; Dobrow
245   et al., 2011; Schraw et al., 2001); and the individual's lifeworld (Husserl, 1970; Pintrich et al.,
246   1993). We used an interview protocol comprising a mix of semi-structured and open-ended
247   questions, with two pilot interviews being conducted for appropriateness and clarity of questions.
248   This led to some refinements in the questions.

249   Participants were recruited through advertisements on campus and by referrals. None of the
250   interviewees were current students of the researchers. We used a non-probability sampling
251   approach to recruit participants (Flick, 2018), involving quota sampling to ensure equal
252   representation of male and female participants (Fox, 2018). Consistent with Francis et al.'s (2010)
253   principles for data saturation, we specified an initial sample of twenty students, with two extra
254   interviews as stopping criteria should no new themes emerge from initial analysis. The
255   researchers were familiar with many aspects of flipped learning and were able to make sense of
256   their observations 'fairly quickly' (Ahrens & Chapman, 2006). This may also have helped us
257   recognise the theoretical saturation levels. Data collection stopped after the twenty second
258   interview, when data saturation became evident. Student interviews were supplemented with five
259   interviews from facilitators. In each interview, student motivation and relationships in the flipped
260   learning environment were explored in detail.

261   On average, interviews lasted between 20 and 30 minutes and were conducted by both
262   researchers. Separate interview protocols were prepared for students and facilitators, which are
263   reported in Appendix 1 and Appendix 2. The interviews were audio recorded and transcribed
264   verbatim. All transcripts were imported into NVivo 12 qualitative-data-analysis software and were
265   subjected to thematic analysis. Themes were generated deductively from SDT (Boyatzis, 1998).
266   Consistent with Khosa et al.'s (2022) approach, the first author coded all transcripts and the
267   second author coded approximately half of the transcripts. With respect to the transcripts coded
268   by both authors, the intercoder agreement was above 90%. Inconsistencies were subsequently
269   reexamined and agreement was reached regarding how anomalies would be recoded. The
270   interview data was coded using two cycles. During the first stage, coding was undertaken to
271   identify major factors supporting and inhibiting motivation; however, it was descriptive in nature
272   and required little interpretation (Tracy, 2019). Codes identified in the first cycle were streamlined
273   and grouped into larger interpretive categories during the second stage. For example, codes such
274   as 'friends', 'connections' and 'teamwork' were grouped as a code-family of 'relatedness'. The
275   presentation of data in an aggregated manner, via the creation of codes, allowed the identification
276   of patterns in the data and enabled inferences to be drawn from it (Lucas, 2015), which was
277   categorised as follows:

278   •   Relatedness: Closer connections, peer learning, and competence through relatedness

279 • Competence: Pre-class resources and videos, and situational interest

280 • Autonomy: Ability to control learning and external pressures

281 • Other: Students' lifeworld and interest, work-life balance, the perceived cost versus
282 perceived benefit, goals/career, variety of challenges, and facilitators' attributes.

283 Four participants (two students and two facilitators) also read and commented on the preliminary
284 analysis to ensure an appropriate fit between participants' understanding of their experiences in
285 flipped learning and our interpretations of their experiences. Generally, the feedback indicated
286 that the analysis was an accurate reflection of participants' experiences; however, the feedback
287 was considered to recategorise some of the nodes. This validation was an important way to
288 establish the credibility of our analysis (Braun & Clarke, 2013).

289 The findings are presented without identifying participants' names or affiliations, as per our ethical
290 responsibilities. Data that could identify participants is not directly quoted.

291 # Results

292 **Sample**

293 Demographics of the student participants (see Table 1) show that male and female students were
294 equally represented, most were pursuing an undergraduate degree in accounting and studying in
295 the third year of their degree. For a significant portion of participants (36.4%), English was not
296 their first language.

297

298 **Table 1: Demographic information of students (in percentages)**

	Male $N = 11$	**Female** $N = 11$	**Total** $N = 22$
Gender	50	50	100
Age			
18–21 years	81.8	100.0	90.9
22–29 years	18.2	0.0	9.1
30 years and older	0.0	0.0	0.0
Discipline			
Accounting	63.6	72.7	68.2
Business	36.4	27.3	31.8
Enrolment year of undergraduate			

Year 1	27.3	27.3	27.3
Year 2	27.3	18.2	22.7
Year 3	45.5	54.5	50.0
Enrolment status			
Domestic	72.7	54.5	63.6
International	27.3	45.5	36.4
First language			
English	90.9	36.4	63.6
Non-English*	9.1	63.6	36.4

299   * Other languages included Mandarin, Bengali, Hindi, Indonesian, and Filipino

300   **Themes**

301   Our interview data reveal that the participants spoke about their learning experiences in ways that
302   provided rich insights into the nature and source of their motivation. The results presented in
303   Table 2 show that nearly all participants (95%) indicated that their relationships with peers and
304   facilitators (i.e., their relatedness), and their perceptions of their learning and competence (i.e.,
305   their competence) had a positive or negative influence on their motivation in the flipped learning
306   environment. A relatively small but not insignificant number of participants (54%) perceived that
307   autonomy had a positive or negative influence on their motivation in the flipped learning
308   environment. The right-hand column of Table 2, which considers not only the number of
309   participants referring to specific factors influencing their motivation but also to the number of
310   references made to each factor, reveals that only 7 percent of the codes referred to autonomy,
311   compared with 30 percent for relatedness and 22 percent for competence. The results also show
312   that basic psychological needs (i.e., relatedness, competence, and autonomy) identified in the
313   SDT account for only 59 percent of all coded segments influencing student motivation. Forty-one
314   percent of the coded segments were judged to be outside the three basic psychological needs.
315   Among these, the consideration referred to most commonly by students was the connection
316   between learning resources and their own world and personal interest in specific subjects or
317   topics (i.e., students' lifeworld and interest). Connection or lack of connection between the course
318   material and students' lived experiences were found to have a positive or negative influence on
319   student motivation.

320

321 Extrinsic factors such as perceived cost versus perceived benefit of engaging with learning, and
322 alignment or lack of alignment between course materials and students' goals and career
323 aspirations (i.e., goals/career) were also influential in explaining motivation. Our analysis suggests
324 that students' motivation was also shaped by work-life balance, new challenges presented (i.e.,
325 variety of challenges), and the facilitators' ability to arouse interest and engage students (i.e.,
326 facilitators' attributes).

327 **Table 2: Factors influencing student motivation**

328

	Number (%) of participants	Number (%) of coded segments
Relatedness	21 (95)	63 (30)
Competence	20 (91)	47 (22)
Autonomy	12 (54)	15 (7)
Total relatedness, competence, and autonomy	**22 (100)**	**125 (59)**
Extrinsic motivational factors		
Perceived cost v. benefit	12	14
Goals/career	9	14
Other factors		
Students' lifeworld and interest	16	31
Work–life balance	11	12
Facilitators' attributes	6	8
Variety or new challenges	6	7
Total other factors	**18 (82)**	**86 (41)**
Total	22	211

329

330 ***Relatedness***

331 The findings show that relatedness is an important factor in assisting learning in the flipped
332 classroom because it enables closer social connections which affect motivation. This
333 "relatedness" results from a culture of active learning that encourages teamwork and frequent
334 presentations:

335   You can't really just sit in a corner and just listen to the teacher. You have to talk … here

336   it feels like you are more involved in the class and you see that everyone else is actually

337   looking at the videos … which gives you the motivation to actually study at home and

338   try to contribute in the class. (Student A)

339 This also manifested itself in relation to attendance because relatedness decreased isolation and
340 affected peer-to-peer learning: "It motivates you to come to class when you can discuss with
341 friends" (Student B). Further, a student who had experience studying in the flipped learning mode
342 and in the traditional lecture–tutorial format in a different institution made the following comment:
343 "I'll stay back and do group work with people … whereas [in the traditional model] I would say in
344 my second unit I probably watched only half of the lectures, maybe and came to half of the tutorials
345 … because it was so hard to go" (Student C).

346 The presence of relatedness in the learning environment is shown to encourage peer learning
347 because students feel responsible to prepare for classes to support their peers: "If I let myself
348 down, that's one thing … you couldn't let the others down by not doing the pre-work for the
349 subject" (Student C). Our results also reveal that a focus on gaining approval from significant
350 others, that is, fulfilling their need for relatedness, was seen as a key to motivation by some
351 students:

352   I like to volunteer to answer questions or present just because … it looks good … I find

353   that people generally tend to like you more. (Student D)

354 A facilitator identified that "it's important for business students particularly to understand how to
355 work effectively with other people" (Facilitator A). In line with this view, some students identified
356 the relationship between the connections made at university and the opportunities that could
357 come later in life:

358   A lot of people say it's about who you know not what you know. Developing those

359   relationships, and the opportunities it will give you later in life, is a massive motivation

360   as well. (Student E)

361 Student E identified with the personal importance of developing long-lasting relationships with
362 peers, accepting it as her own, which is a more autonomous form of extrinsic motivation.

363

364   ***Competence through Relatedness***

365   The data clearly revealed the connection between relatedness and competence. Students
366   identified that working with peers in a fully-flipped program gave them increased opportunities to
367   improve their marks. For example, "I've got friends doing [other] degrees …in this degree ... my
368   grades are a lot higher. I think because I've been able to work with peers to get better
369   assessments" (Student F).

370   Relatedness can be of particular benefit to social learners: "You get to work in a group, to talk and
371   actually interact, which is more how I learn" (Student E). However, not all students found it
372   productive to work in groups:

373   I think productiveness is actually lost when put into a group discussion because there's

374   the social aspect which gets tied in. (Student H)

375   This view was also supported by a facilitator: "the group-work aspect is quite good to a certain
376   extent … provided it's in a controlled way or they can just turn the whole working session into
377   leisure stuff" (Facilitator B).

378   Our analysis suggests that students' motivation is also shaped in part by approval from self or
379   others when the student performs an activity to enhance or maintain self-esteem, which results in
380   enhanced competence:

381   I want to be more confident. I'll be able to talk to my peers … I'll be able to answer the

382   question the facilitator asks. I think that is another part of the motivation as well. (Student

383   I)

384   ***Competence***

385   Students' perceptions of their competence were sometimes related to learning in general, and
386   sometimes to specific aspects of learning such as their ability to participate in class, their ability
387   to achieve requirements set by the facilitator, their subject knowledge, and their ability to acquire
388   the skills necessary to excel in their career. We find evidence to support that the flipped classroom
389   arouses situational interest through weekly quizzes and assessments, leading to higher levels of
390   motivation. For example, one student stated the following: "because we have a weekly quiz … I
391   definitely want to get a good mark for that … you can see where people have struggled in the pre-
392   class, so, oh, I need to spend a bit more time on this one" (Student E).

393   Many students viewed pre-class materials as an important learning resource. However, some
394   facilitators considered that students learn principally in the group space (class), which undermines
395   the value of the pre-class resources. An accounting facilitator commented the following: "I think
396   it's in the class itself. Pre-class is just something for them to get familiar" (Facilitator C).

397

398   The least autonomous forms of extrinsic motivation manifested themselves in a variety of ways,
399   most commonly through marks attached to pre-class, in-class, and post-class activities that the
400   students viewed as external. Several participants acknowledged that completion of an activity
401   merely to gain marks would not enhance their motivation "that wouldn't motivate me, that would
402   just make me do it" (Student A).

403   However, a facilitator's comment that "you cannot just simply make a student do something
404   without any payback in terms of accumulation of scores" (Facilitator B) demonstrates the
405   importance of allocating a reward in the form of marks to encourage completion of in-semester
406   activities. This was mediated by constant reminders about the benefits of completing certain
407   activities. For example, "you're being treated as a person responsible for your own learning and
408   for your own fate" (Facilitator B). The purpose of facilitators highlighting the importance of
409   assessment marks is for students to internalise an external reward to enhance their motivation.

410   ***Feedback on Videos***

411   Full-time students studying four subjects may be required to spend significant time in preparation
412   for class each week. Their experience with preparation time resulted in quite strong and clear
413   feedback, particularly about the length and supporting materials. For example, one student stated
414   the following: "when there's a lot of videos to watch, that's quite annoying. It's much easier to
415   extract knowledge from seeing it written on your computer" (Student F). Another student stated
416   the following: "I find some might just do a massive … YouTube that's 15 minutes long. No offence,
417   but no one is going to watch that" (Student E), alluding towards fatigue regarding meeting the
418   expectations of a fully-flipped program. Participants who indicated an unwillingness to interact
419   with pre-class modules showed awareness that there can be a lack of congruence between the
420   content of the learning resources and their career goals (i.e., lack of integration). These students
421   called for more concise content and the provision of relevant examples from practice, "you
422   definitely should make it a little bit shorter … provide one or more cases related to it, that actually
423   happened in real life" (Student A). Students also indicated a preference for supporting notes or
424   directed reading, particularly for difficult topics, for example: "the lecturer … could do a whole
425   video [but then only provides] a little bit of notes" (Student E).

426   ***Autonomy***

427   Our analysis of the data shows that students found the ability to access learning resources in their
428   own time enhanced their ability to learn by providing an opportunity outside the classroom to
429   engage with materials. Having access to materials allows students to take responsibility for their
430   learning:

431   I like the access to resources and that you can do a lot of the work at home … [if] … you
432   can't focus very well in class … you can still take it upon yourself to learn the material.
433   (Student F)

434 However, some participants indicated that the ability to access learning resources in their own
435 timeframe was expected, regardless of the teaching approach. The flipped classroom approach
436 may not create a higher level of autonomy in students because the use of online lecture recordings
437 in the traditional lecture and tutorial format is becoming increasingly popular at all Australian
438 universities (Williams et al., 2012) and at international universities (Wieling & Hofman, 2010):

439   Definitely, it gives the autonomy to access it whenever we want … but at the same time,

440   I kind of expect that degree of flexibility. (Student J)

441 One student stated the following on this aspect of flipped learning: "I don't miss out on anything if
442 I don't do the pre-class. Like, if I'm still learning and doing everything that's needed in class. So,
443 I didn't see the need to do the pre-class, before I come to class. So, I see it more as a revision"
444 (Student B). In contrast, from the facilitator's perspective, it is highly important that students
445 complete the pre-class materials before attending the class because the in-class activities are
446 built on the pre-class concepts. However, this is not always achieved, and one facilitator reported
447 feeling the need to repeat the pre-class material during the class for students who had not
448 engaged with pre-class resources:

449   You can't proceed through because you are just going to lose them if they didn't do their

450   [pre-class] work. You will have to do it in class … otherwise, you just end up having them

451   fail. And I don't know how that is productive at all. (Facilitator B)

452 As expressed by many students, this has certain implications for student motivation. Repetition
453 of pre-class material during the class time undermines the value of completing these activities
454 before the class, and the cohort of students who had not completed the material did not see
455 themselves at a disadvantage. Further, if facilitators repeat the information from the pre-class
456 materials in the workshop, this may inhibit the autonomy of the group of students who completed
457 the pre-class activities because it violates these students' identification and the student becomes
458 more dependent on the facilitator to explain the material:

459   You do the pre-work ready for class. But then maybe it's because all those students

460   haven't done the pre-class yet, the teacher ends up just going through it. And so, then

461   it's like, oh, no point doing pre-class. (Student F)

462 This shows the importance of facilitators understanding the basic concepts and approaches to
463 teaching in a flipped classroom pedagogy to ensure its benefits are achieved.

464 ***Students' Lifeworld and other Factors***

465 A student's lifeworld refers to the lived experiences that they bring to the course. Connecting
466 course materials with a students' lifeworld assists learning where the student has autonomy to
467 choose the case study topic:

468   Projects where there's some initiative from students to choose is good … there was a

469   whiskey company I bought shares in and my father has just opened a whiskey bar …

470   case study on that company really made learning a lot more fun and interesting. (Student

471   F)

472 Students having familiarity with or interest in a topic or example was reported to help their learning:
473 "just making it more familiar also then helps you learn because it triggers that little thing and you're
474 like oh, this relates to this … that's what I find good" (Student E). This indicates the importance of
475 gaining a deeper understanding of a students' lifeworld when designing course materials.

476 Some facilitators who teach technical subjects expressed the importance of meeting the challenge
477 of making the content more exciting and relatable for students:

478   Well, they say that making it more interesting and more lively might help … how do you

479   make this more exciting … some of the work that we do as a professional, it's not always

480   interesting. (Facilitator B)

481 The use of case studies in teaching was found to assist with increasing interest in topics that were
482 dry and technical. For example, one student stated that the "unit content was not that interesting,
483 it was boring stuff but became interesting when we read real case reports" (Student A). Students
484 also highlighted the importance of providing examples and of keeping content current. For
485 example, one student stated the following: "If we are still talking about something like 2008, it's
486 too far away. If we keep the examples or the material updated, just something happening last
487 year, I think that'll be more interesting" (Student I). Current university students live in a world of
488 media overstimulation (Berk, 2009), with abundant information available that becomes outdated
489 very rapidly. Academics should consider this when developing and updating learning resources.

490   **Discussion**

491 This section discusses how our findings contribute to the broader literature, identifies several
492 implications and recommendations for academics and practice and acknowledges limitations of
493 our study.

494 This study provides powerful insights into factors that enhance or impede student motivation in
495 the flipped learning environment. Our findings suggest that relatedness, competence, and
496 autonomy (SDT) have an important effect on students' motivation in the flipped learning
497 environment. Although it is not possible to enhance a more autonomous form of extrinsic
498 motivation, unless it entails personal endorsement from the learner, we found that guiding
499 students to an understanding that a certain activity or behaviour is important or relevant for their
500 career or goals is likely to facilitate internalisation. Conversely, the completion of an activity to
501 comply with a course requirement will not result in self-determination. Attainment of social skills
502 and a sense of relatedness are found to support internalisation and a student's need for
503 competence. For some students, engagement with pre-class learning resources was influenced
504 by ego-enhancement or pride. In a flipped program, it may be beneficial to have dedicated
505 discipline-specific study areas to achieve the full benefit of relatedness as access to confined

506 group spaces was found to help develop bonds among peers. In answer to McNally et al.'s (2017)
507 call, the current findings shed light on how best to introduce a flipped classroom.

508 Our findings indicate that the way in which the facilitator manages the connection between the
509 pre-class and in-class activities has a direct effect on student autonomy. The common conception
510 of the flipped classroom is that the traditional lecture or tutorial is replaced with a video lecture
511 (Abeysekera & Dawson, 2015) as part of pre-class work. However, our findings provide strong
512 evidence that recorded videos are perceived as ineffective and inadequate if they are not
513 supported by text and reading modules, thus leading to lower levels of motivation in students to
514 complete pre-class modules. These pressures associated with fatigue from watching a large
515 number of videos are shown to amplify when the whole program is delivered in the flipped mode.
516 Bracci et al., (2020) identified that teaching methods which are inconsistent with students' learning
517 preferences are unlikely to improve academic performance and attitudes towards learning. Thus,
518 it is important to break the videos down into smaller segments to ensure they are focused and are
519 not overly long.

520 Further, a students' lifeworld or interest was found to affect student motivation. That is, when the
521 facilitator presents learning resources or examples a student can relate to, the student
522 experiences increased interest in the subject, resulting in higher levels of motivation. Thus, in line
523 with Dobrow et al. (2011) and Schraw et al. (2001), our findings strongly suggest the benefits of
524 fostering interest through choice. One way of enabling choice would be to allow students to select
525 cases or companies for their assignments and assessments (rather than the facilitator making
526 such choices) to align the content with a students' personal interests; however, this should be
527 achieved in conjunction with ensuring the assessments can be standardised to facilitate marking.
528 The flipped learning environment allows for more weekly assessments. For some students, not
529 obtaining a good mark in these assessments led to increased interaction with learning materials
530 to improve their next mark; thus, these students exhibited information-seeking behaviour.

531 This study makes several contributions to scholarship on the flipped classroom. First, by
532 explaining how the fulfillment of cognitive needs in a fully-flipped program has the potential to
533 enhance student motivation (i.e., observable changes in the patterns of class attendance,
534 engagement, and completion of pre-class activities), our findings provide a way to discuss student
535 motivation in the flipped environment and the resulting implications for educators and universities.
536 In contrast to earlier studies, which have primarily focused on whether the blended learning
537 models offer better student outcomes (e.g., Bergfjord & Heggernes, 2016; Brown et al., 2016;
538 Lento, 2018; Khan & Watson, 2018; McCarthy et al., 2019; Pattanaphanchai, 2019) and
539 identifying characteristics of students that benefit the most from the flipped approach (see Chuang
540 et al., 2018), we focus on how to best support students' cognitive needs to maximise the potential
541 of the flipped classroom. Second, evidence regarding the length of the videos, the provision of
542 reading, and the consequences of not completing the pre-class activities inform our understanding
543 of how facilitators' behaviours have critical consequences on student motivation. For example,
544 this study offers new insights into how a facilitators' decision to repeat pre-class materials in the
545 class creates a behavioural response from students. Third, this study also qualifies and extends
546 SDT by demonstrating that in addition to relatedness, competence, and autonomy, students'

547   motivation is also shaped by a wider range of environmental factors (e.g. work-life balance, variety
548   of challenges) and individual dispositions (e.g. students' lifeworld and interest).

549   **Practical Implications**

550   Drawing on the findings of this study, there are a number of recommendations for pedagogical
551   practice. Firstly, to facilitate internalisation, there needs to be an emphasis on highlighting the
552   importance of certain behaviour or activity to students' career or goals. Findings related to student
553   engagement being mediated by ego-enhancement suggests that academics adopting the flipped
554   learning approach should embrace group tasks and activities to develop relatedness in their
555   students. Secondly, our findings show that despite being generally satisfied with the pre-class
556   activities, student motivation is influenced by the length of videos, provision of reading or notes to
557   supplement videos and consequences of not completing the pre-class activities. Finally, where
558   possible, educators should allow students to select cases or companies for their assignments and
559   assessments as students' social context or familiarity with the learning resources is shown to
560   enhance student motivation.

561   To offer pedagogy for transitioning from passive learning to active learning, we argue it is
562   necessary to support students' cognitive needs as identified in SDT, as well as the other
563   environmental factors and individual dispositions found in this study.

564   **Limitations**

565   We acknowledge a number of limitations of this study, some of which are common to many studies
566   employing qualitative research methods: (1) results may be influenced by response bias because
567   students who participated in the research may be motivated to participate because of either an
568   extremely (dis)satisfying learning experience; (2) participants comprised only a small portion of
569   students in an Australian university. However, case-study research can be transferred to similar
570   contexts (Braun & Clarke, 2013), and has been shown to yield a rich and thick description of the
571   phenomenon under study rather than provide shallow but broad data (Parker & Northcott, 2016).
572   We also acknowledge that the validity of our findings relies on the accuracy of our own inferences
573   from the participants' responses. Mitigating researcher bias was helped through employing the
574   following methods: (1) consistent application of the coding framework developed based on SDT;
575   (2) closeness of the code to the raw information; (3) using both authors to code the information;
576   (4) having the participants validate the development of themes and codes.

577

Conclusion

578

579 The present research has considered the effectiveness of the flipped classroom approach by
580 considering student learning outcomes in relation to motivation, which is considered an outcome
581 of the learning environment. The contribution of our study is that it provides empirical evidence
582 for factors that influence student motivation in the flipped learning environment, and demonstrates
583 how more autonomous forms of extrinsic motivation can be used to enhance intrinsic motivation.
584 While earlier research has provided evidence on students' perceptions of the flipped classroom,
585 no previous study has examined the relative significance of basic psychological needs (SDT) and
586 other factors in relation to the flipped learning environment. The findings are of particular interest
587 to academics; however, unlike earlier studies focusing on only one unit, the results can be
588 generalised across all business subjects because they are based on the implementation of the
589 flipped classroom approach for the entire range of subjects in a business degree. We argue that
590 academics and education providers must carefully consider multiple influences on student
591 motivation and be aware of the importance of creating an environment that facilitates student
592 internalisation of active learning methods.

593 Our findings show that the flipped learning environment can affect student motivation on multiple
594 levels. Personal endorsement and a feeling of choice are critical for the enhancement of more
595 autonomous forms of motivation, whereas externally regulated activities may result in mere
596 compliance. Given that extrinsically motivated behaviours are not inherently interesting, it is
597 important to provide a sense of relatedness. Our findings related to the length of videos or the
598 provision of reading materials are important because universities are currently placing great
599 emphasis on converting existing lectures into pre-class modules, and if these factors are not
600 considered carefully, then students may not interact effectively with these materials.

601 This study has demonstrated that carefully considering the design of pre-class materials and
602 workshop activities can lead to increased motivation of students in relation to relatedness,
603 competence, autonomy, environmental factors, and individual dispositions. However, if the flipped
604 classroom approach is implemented without the necessary care, a great deal of time and effort
605 spent in preparing course programs and lessons could result in a learning environment that is
606 less conducive to student learning and increase pressures on educators who are required to
607 deliver lessons in the flipped format.

Conflict of Interest

608

609 The author(s) disclose that they have no actual or perceived conflicts of interest. The authors
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856

857 **Appendix 1.**
858 **Interview questions for students**

859

860 1. How has your experience been learning in the flipped classroom environment?
861 2. Does the flipped classroom approach suit your learning style?
862 3. How have you liked the freedom to engage with pre-class material at your own pace?
863 4. What motivates you to engage with pre-class materials? What dissuades you from
864   completing pre-class materials?
865 5. How do you feel this classroom approach has contributed to your learning?
866 6. What motivates you to participate in class discussions?
867 7. Do you find that when learning material has a connection to your interests it increases
868   your ability to understand or motivation to learn?
869 8. Do you feel that flipped mode assists you to make connections with other students?
870 9. What skills do you feel this classroom style has assisted you with? Are there any skills
871   you lack?
872 10. Can you provide me details of any low or high points during your program?

873 **Appendix 2.**
874 **Interview questions for facilitators**

875

876 1. How has your experience been teaching in the flipped classroom environment?
877 2. Does the flipped classroom approach suit your teaching style? Does it suit students'
878   learning style?
879 3. In your opinion, how do students like the freedom to engage with the pre-class material
880   at their own pace?
881 4. What are your views on student motivation in this program? Do you think flipped
882   environment has the potential to influence their motivation level?
883 5. In your opinion, what motivates students to engage with pre-class materials? What
884   dissuades them from completing pre-class materials?
885 6. How do you feel this style of teaching contributes to students' learning?
886 7. In your opinion, what motivates students to participate in class discussions? Do you find
887   students are more likely to attend class when there is a mark attached?
888 8. What are your considerations while developing learning materials and activities? Do you
889   find that when learning material has a connection to students' interest it increases their
890   motivation to learn?
891 9. Do you feel that flipped mode assists students to make connections with other students?
892 10. What skills do you feel this classroom style has assisted students with? Are there any
893   skills students lack?

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