

Students' Motivation and Its Changes as the Course Progresses

Emergent Research Forum

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Abstract

Increasingly universities use educational tools within their learning systems. It is assumed that the provision of these tools would stimulate self-regulated learning. There are studies which show students are different regarding tool use but they compared tool use regarding age and gender. We investigated students' motivation which affects the amount of tool use in a real classroom. The Motivated Strategies for Learning Questionnaire (MSLQ) was run three times in an undergraduate course at a leading University in New Zealand to explore students' self-reports on their motivation and use of learning strategies. A group of 188 students participated in the questionnaire to explore how students' motivation changed as the course progressed. Our preliminary analysis showed that students' motivation levels increased and decrease at different points in the course. The trend for students' use of strategies such as rehearsal, elaboration, metacognitive self-regulation, and critical thinking increased, but their organizational strategies decreased.

Keywords

Students' motivation, MSLQ, blended learning environment.

Introduction

Today, digital technologies are integrated with people's lives and have changed the way people communicate and consume things. These technologies have become a primary source of acquiring information for people. With the rise of technology use, in the 1960s and 1970s, computers became part of the instructional design in the educational field. By introducing technology in the education field, the traditional way of teaching has changed to a more blended learning environment. In such learning environments, the students need to study before coming to the class. In other words, using blended approach focuses on producing learners who can take control of their learning. Aim for teaching and learning is to produce lifelong learners who have the ability to take control of their learning and be self-regulated learners. Dabbagh (2002) claims that technology tools help to enrich students' learning by developing students' self-regulatory skills. Self-regulated learning (SRL) has been identified as a factor affecting students' learning and achievement. SRL has been measured by different scholars (Pintrich 1991; Winne and Hadwin 1998). Most theories of SRL focus on students' motivation (Credé and Phillips 2011; Gardner 1995; Zimmerman and Martinez-Pons 1988). Winne and Hadwin (2008) agree with Pintrich's ideas regarding motivational factors which affect the behavioural, contextual and cognitive variables (Pintrich 2000b). The focus of this study was to find out about the motivation of students (as a student variable) to see how students' motivation (internal condition) changed and how it the affected course outcome of the students. Pintrich and De Groot (1990) explained how every three components of self-regulated learning were connected to motivation. For this purpose, we followed Pintrich's work (Pintrich and De Groot 1990) to gauge students' motivation and self-regulated learning in the classroom. We ran MSLQ questionnaire three times in the course. Gašević et al. (2017) ran MSLQ once at the start of the course. However, Martin et al. (2015) noted that students' motivation and engagement changed within a day and between students. Therefore, we ran the survey three times in a course to answer the following research question:

"How does students' motivation change over the course and to what extent does student motivation affect their course outcome?" There are other study talks about the relation of motivation and course

outcome, but their explanation was limited as they are not looking at the motivation over time. This study looked at motivational changes as a result of this program. Pintrich's motivational theory (Pintrich and De Groot 1990) served as a theoretical framework to explain undergraduate students' motivation. Year One students were selected because we aimed to recruit students who were new to the system and who were inexperienced with audience participation tools. For this study, we focused on the components of the model i.e. motivational processes, cognitive processes, and outcomes. These findings help us to understand why students are different regarding tool use and why they are performing differently. We were investigating this issue from a motivational perspective. We were looking at the change of motivation, as theories look at motivation as a process and not as a product. We recognize that there are other factors which could affect the tool use and performance, but in this study, we will focus on motivation. Up until now, we have explained the topic we are investigating and its contribution to the field of instructional design. In the next sections, we review extant literature; our methods, findings, conclusions, and limitations.

Literature review

Dabbagh and Kitsantas (2005) stated that by having various toolsets, students could choose the tool that supports their learning. This will stimulate, self-regulate, and motivate learning. However, students have their own agency and decide for themselves whether to use the tool or not. This view comes from the self-regulated learning (SRL) perspective that looks at students as an active agent who are responsible for their learning. There are different studies which investigate how students use the available tools. The findings revealed that students differ regarding the amount of tool use (Esnaashari et al. 2018; Hung et al. 2017; Romero et al. 2008). Although there is research on the users' intentions to use a tool, there is not enough on the factors that influence adoption and tool use, therefore, it is important to find out the factors that affect usage. As Winne notes Winne (1982) there are different conditions which affect students' tool use. Thus, conditions such as 1) students' thinking about the learning task, the tool, and its usefulness 2) students' ability to adequately use the tool, and 3) students' motivation, all affect tool usage.

Dabbagh and Kitsantas (2005) argued that even though the lecturer provides all the students with the same tool, they use the tool differently based on their motivation and their level of self-regulation. In terms of individual differences and their effects on using learning technologies, age, and gender are the factors that have been investigated the most (Chmielewski 1998; Hoskins and Van Hooff 2005; Huon et al. 2007). However, there is no theory backing up their argument. We are checking the motivation of students as it has been identified as an important factor in SRL. As mentioned in the social cognitive theory of Bandura (1986), students' beliefs about their skills had more effects on students' behaviour compared to the actual technical skills and support. On the other hand, Pintrich and De Groot (1990) also discussed the importance of three components of motivation in performing the task. We follow Pintrich's (2000a) theory of motivation. Pintrich (2000a) theory of motivation has been recognised as an important theoretical approach to understand the motivation of students. There are different studies that looked at the factors that affect students' success. Most of them focus on students' motivation and use of learning strategies (Pintrich 1991; Pintrich et al. 1993; Zimmerman and Martinez-Pons 1990). MSLQ is a self-report, measuring students' reported cognitive strategy use (e.g., rehearsal, organization strategies, elaboration), their reported self-regulation (e.g., cognitive engagement, time, place and effort regulation), their reasons for engaging in a task (value component) and their beliefs about their own capacity to perform specific strategies and to control the learning situation (expectancy component).

Methods

Participants were 188 first-year students from a high ranking University in New Zealand. This was a blended learning course which was run for 12 weeks. The core material was available on the course web page, and review sessions were conducted for discussion purposes. The students were required to watch all the videos and participate in the quizzes at the end of videos before coming to the review sessions. There was a review session conducted weekly for students. Students had the option of going to class in person or watch the review session online when it was streaming and participate in the quizzes run by the lecturer in class. The lecturer used an audience participation tool in class to engage the students in class activities. The students needed to beat other peers in class so that their name appeared on the leaderboard. The students had access to Piazza in case they needed to clarify anything among themselves or with their lecturer. We used a quantitative method to examine the motivation of students as a factor that would affect students' self-regulated learning. We asked about students' attitude and belief in the self-reported survey. We used the Motivated Strategies for Learning Questionnaire (MSLQ)

to measure students' reported motivation and strategy use. We ran MSLQ three times in the course and asked students to complete three surveys. It is shown that we run MSLQ, three times in Week 3, Week 7, and Week 11. In our larger study, based on how students answer the MSLQ questionnaire, we clustered the students to four groups and interviewed three students from each cluster. In total, we interviewed 12 students twice in the course.

Analysis

We ran MSLQ three times. We investigated how the motivation and students' strategy use changed over the course by comparing the descriptive analysis of each iteration of MSLQ across all the components. This analysis was based on how students judge their motivation and strategies. Then we calculated the value, expectancy, affective, cognitive and metacognitive and resource management strategy components and compared the descriptive analysis of the components.

Motivation scales include value, expectancy, and affective. Value component which was calculated based on a) intrinsic goal orientation, b) extrinsic goal orientation, and c) task value decreased for the second measure, and it increased again for the third measure (71.07, 64.23, 68.68).

Goal orientation in MSLQ refers to students' general goal to the course including both intrinsic and extrinsic motivation. Intrinsic goal orientation which is about the challenge, curiosity and mastery reasons that students have for their participation declined for all three measures (18.71, 18.21, 17.94). Extrinsic goal orientation which is about the reasons such as grades, rewards, performance, evaluation by others, and competition for the students to participate in the activities also declined for the second measures, but it increased for the last measure (21.08, 20.28, 20.37).

Task Value which is about how interesting and important the task is as the course progressed. This time we had more change in task value (31.56, 25.74, 30.36). It decreased for the second measures but increased for the third measures. Expectancy components which include a) control beliefs and b) self-efficacy for learning and performance decreased for the second measure and increased again for the third measure (59.57, 59.33, 58.51).

Control belief considers how students' beliefs about their efforts to learn will result in positive outcomes. Students' control beliefs in contrast to other constructs increased in the second measure, but it decreased for the third measure (20.47, 20.56, 20.12). Students' beliefs are important in their learning. In contrast with other measures control belief increased for the second measure, and then again it decreased (Zusho et al. 2003). Self-efficacy is about students' judgment regarding their abilities and whether or not they are able to master a task. Our analysis showed that students' self-efficacy decreased as the course progressed for all the measures (39.10, 38.77, 38.39).

Affective Components which is about Test Anxiety (22.77, 22.62, 22.57) decreased as the course progressed. Test anxiety is believed to have a negative effect on performance. It includes two components of worry and emotional components. Test Anxiety is the only measure that is good to see it has decreased. It shows the level of stress and worry about students' learning. It showed as the course progressed, students' level of anxiety decreased (23.00, 22.62, 22.84). Motivation/affect area in Pintrich's model table is calculated based on intrinsic goal orientation, extrinsic goal orientation, task value, control beliefs, self-efficacy for learning and performance, and test anxiety. As our analysis showed, motivation at the start was high, then in the middle of the course, it declined, and again at the end of the course, it again increased (152.45, 146.18, 148.22) that is consistent with other studies such (Zusho et al. 2003) which showed decrease in the motivational level of students as the course progressed.

The Strategy scale includes cognitive and metacognitive strategies and resource management strategies. Cognitive and metacognitive strategies which include a) rehearsal, b) elaboration, c) organization, d) critical Thinking, and e) metacognitive self-regulation increased as the course progressed which is a good sign for using cognitive and metacognitive strategies (134.27, 136.08, 138.83).

Rehearsal is a strategy for reciting or recalling items from the list of things to learn. The students' report on rehearsal increased among all the measures as the course progressed (17.42, 18.55, 18.92). Elaboration, which is the level of strategy, students focus on extracting meaning, summarising, or paraphrasing increased as the course progressed (27.39, 27.43, 28.12). It showed that students were absorbing more strategies. Organisation is referred to strategies that students used to construct connection among information. In contrast to rehearsal and elaboration, the organisation decreased a lot for the second measure and increased again for the third measure (19.2021, 18.9180, 19.22703) The only construct that decreased was the cognitive and metacognitive strategy. Critical thinking considers how students apply previous knowledge to the new situation. The data showed an increase in critical thinking as the course progressed (19.26, 19.38, 19.54). Metacognitive self-regulation refers to the

awareness, knowledge, and control of cognition. It again increased as the course progressed (51.13, 52.43, 53.03). All the constructs, except the organisation, in cognitive and metacognitive strategies increased as the course progressed.

Resource management strategies which include a) time and study environment, b) effort regulation, c) peer learning, and d) help-seeking decreased for the second measure and increased for the third measures (80.03, 78.47, 79.51). Time and study environment besides cognitive strategies were important. This included strategies for scheduling, planning, and managing. It decreased as the course progressed (37.87, 37.15, 36.79). Effort regulation considers students' ability to control their effort for performing a task. This again decreased as the course progressed (19.17, 18.52, 18.48). Peer learning considers how students can collaborate with other peers. It decreased for the second measure and increased for the third measure (10.04, 10.02, 10.78). Help-seeking is another aspect that students needed to improve as they intended to learn. It decreased for the second measure, but it increased again for the third measure (12.94, 12.77, 13.45). Cognition areas are covered by rehearsal, elaboration, organisation, critical thinking, and metacognition. The strategies of students decreased a little bit for the second measure, but they increased a lot closer to the end of the course for the third measure (214.30, 214.12, 218.34). In strategy use, rehearsal, elaboration, metacognitive self-regulation, and critical thinking increased, and just organisation decreased. Students reflect on their strategies as they went through the exam.

Discussion and Conclusion

We investigated motivation and self-regulated learning by running MSLQ three times in the course. The quantitative survey helped us to measure the separate constructs. We ran the questionnaire three times to see how the motivation of students changed. We collected data from 188 students and compared the components across the three surveys. Students' motivation components all decreased in the second measure and increased for the third measure except control beliefs. The decrease in motivation was also well documented by Zusho et al. (2003). The findings showed that motivation decreased which is consistent with other studies in the literature but it decreased less, and it increased again after the midterm. We intended to see in our future study how low achievers and high achievers were different in terms of their motivation. We intend to see if high achievers actually would report higher self-efficacy. We found that as the course progressed, students' judgments of their confidence to do well in the class and task importance also decreased for the second measure and it increased for the third measure. Task importance incline also showed that students, as the course progressed, believed the tools were more important in their learning. It is consistent with our qualitative data which students believed that tools were more important as the course progressed. In terms of strategy use, students' strategy use increased as the course progressed except for organisation component which decreased for the second round and increased again for the third round. Our finding in regards to students' strategy use is in contrast to other studies (e.g. Zusho et al. 2003). In our future study, we will relate the motivation and cognitive components to the student final course outcome. We intend to understand the components which affect the performance. We know that it is not enough to understand which components have affected the performance but we also need to understand how we can improve those features, for example, self-efficacy and task value among the students, or, for example, teach students how to employ new strategies so that they can achieve better. It is true that we did not find significant changes in their motivation, but we need to see how we can moderate the students' motivation in the process through changes in the classroom context. In our future study, we will also look at students from different motivational groups and will investigate how their beliefs are different in terms of their self-efficacy. We also intend to see how different genders judge their motivations, self-efficacy, and control beliefs.

REFERENCES

- Bandura. 1986. "Social Foundation of Thought and Action: A Social Cognitive Theory," Prentice Hall, Englewood Cliffs, NJ.
- Chmielewski, M. A. 1998. "Computer Anxiety and Learner Characteristics: Their Role in the Participation and Transfer of Internet Training". Wayne State University.
- Credé, M., and Phillips, L. A. 2011. "A Meta-Analytic Review of the Motivated Strategies for Learning Questionnaire," *Learning and Individual Differences* (21:4), pp. 337-346.
- Dabbagh, N. 2002. "Using a Web-Based Course Management Tool to Support Face-to-Face Instruction," *The Technology Source*:12, pp. 32-51.
- Dabbagh, N., and Kitsantas, A. 2005. "Using Web-Based Pedagogical Tools as Scaffolds for Self-Regulated Learning," *Instructional Science* (33:5), pp. 513-540.

- Esnaashari, S., Gardner, L., and Rehm, M. 2018. "Characterizing Students Based on Their Participation in the Class," *International Conference on Artificial Intelligence in Education*: Springer, pp. 84-88.
- Gardner, J. W. 1995. *Self-Renewal: The Individual and the Innovative Society*. WW Norton & Company.
- Gašević, D., Jovanovic, J., Pardo, A., and Dawson, S. 2017. "Detecting Learning Strategies with Analytics: Links with Self-Reported Measures and Academic Performance," *Journal of Learning Analytics* (4:2), pp. 113-128.
- Hoskins, S. L., and Van Hooff, J. C. 2005. "Motivation and Ability: Which Students Use Online Learning and What Influence Does It Have on Their Achievement?," *British journal of educational technology* (36:2), pp. 177-192.
- Hung, J.-L., Wang, M. C., Wang, S., Abdelrasoul, M., Li, Y., and He, W. 2017. "Identifying at-Risk Students for Early Interventions—a Time-Series Clustering Approach," *IEEE Transactions on Emerging Topics in Computing* (5:1), pp. 45-55.
- Huon, G., Spehar, B., Adam, P., and Rifkin, W. 2007. "Resource Use and Academic Performance among First Year Psychology Students," *Higher Education* (53:1), pp. 1-27.
- Martin, A. J., Papworth, B., Ginns, P., Malmberg, L.-E., Collie, R. J., and Calvo, R. A. 2015. "Real-Time Motivation and Engagement During a Month at School: Every Moment of Every Day for Every Student Matters," *Learning and Individual Differences* (38), pp. 26-35.
- Pintrich, P. R. 1991. "A Manual for the Use of the Motivated Strategies for Learning Questionnaire (Mslq)", The University of Michigan, Ann Arbor, MI.
- Pintrich, P. R. 2000a. "An Achievement Goal Theory Perspective on Issues in Motivation Terminology, Theory, and Research," *Contemporary educational psychology* (25:1), pp. 92-104.
- Pintrich, P. R. 2000b. "The Role of Goal Orientation in Self-Regulated Learning," *Handbook of self-regulation* (451), pp. 451-502.
- Pintrich, P. R., and De Groot, E. V. 1990. "Motivational and Self-Regulated Learning Components of Classroom Academic Performance," *Journal of educational psychology* (82:1), p. 33.
- Pintrich, P. R., Smith, D. A., Garcia, T., and McKeachie, W. J. 1993. "Reliability and Predictive Validity of the Motivated Strategies for Learning Questionnaire (Mslq)," *Educational and psychological measurement* (53:3), pp. 801-813.
- Romero, C., Ventura, S., and García, E. 2008. "Data Mining in Course Management Systems: Moodle Case Study and Tutorial," *Computers & Education* (51:1), pp. 368-384.
- Winne, P. H. 1982. "Minimizing the Black Box Problem to Enhance the Validity of Theories About Instructional Effects," *Instructional Science* (11:1), pp. 13-28.
- Winne, P. H., and Hadwin, A. F. 1998. "Studying as Self-Regulated Learning," *Metacognition in educational theory and practice* (93), pp. 27-30.
- Winne, P. H., and Hadwin, A. F. 2008. "The Weave of Motivation and Self-Regulated Learning," *Motivation and self-regulated learning: Theory, research, and applications*:2, pp. 297-314.
- Zimmerman, B. J., and Martinez-Pons, M. 1988. "Construct Validation of a Strategy Model of Student Self-Regulated Learning," *Journal of educational psychology* (80:3), p. 284.
- Zimmerman, B. J., and Martinez-Pons, M. 1990. "Student Differences in Self-Regulated Learning: Relating Grade, Sex, and Giftedness to Self-Efficacy and Strategy Use," *Journal of educational Psychology* (82:1), p. 51.
- Zusho, A., Pintrich, P. R., and Coppola, B. 2003. "Skill and Will: The Role of Motivation and Cognition in the Learning of College Chemistry," *International journal of science education* (25:9), pp. 1081-1094.