EFFECT OF A MINI LESSON ON SELF-REGULATED LEARNING ON STUDENTS' LEARNING

Amir Maleki¹, Costanza Picolo² and Jonathan Verrett³

¹Department of Mechanical Engineering, ²Department of Mathematics, ³Department of Chemical and Biological Engineering, The University of British Columbia
amaleki@interchange.ubc.ca, constanza@math.ubc.ca, jonathan.verrett@ubc.ca

Abstract – There has been much interest in self-regulated learning in the past few decades. Various studies have reported significant effects on student outcomes when delivering training on self-regulated learning. In this study we investigate the effectiveness of a 50 minute workshop on self-regulated learning in changing the actions and perceptions of students. Surveys indicate slightly greater student self-confidence, pre-lecture review and comfort seeking help from instructors. Students report less use of goal setting behaviours and little changes in minimizing distractions while studying and the use of rephrasing to practice key course concepts. Suggestions for improvements to this intervention are to spread training between multiple sessions so as to better reinforce habits and attitudes related to self-regulated learning.

Keywords: Self-Regulated Learning; WeBWork; Open Educational Resources; Material and Energy Balances; Chemical Engineering

1. INTRODUCTION

Self-regulated learning has been a topic of research in the educational community in the past few decades, and is shown to be a key element in students' success [1]. However, for many students the process of monitoring and regulating their learning does not happen naturally [2]. Providing a thorough education on how to be self-regulated learners can be difficult in university settings, mainly due to time limitations. One viable option is to briefly introduce students to strategic advice that supports self-regulated learning. Previous minimal interventions reportedly offer great success in improving students' performance in their academic grades [3]–[5].

What has been implemented before is the so called “study skill strategies”, an example of which was led by Sandra McGuire [3], [4]. While her group reported success in creating behavioral change in students, they arguably only target one aspect of self-regulated learning: Metacognition. Metacognition is “the awareness learners have about their general academic strengths and weaknesses, cognitive resources they can apply to meet the

demands of particular tasks” which is mostly referred to as “study skills” [6]. The two other important aspects of self-regulated learning are “motivational skill” and “strategical skills” [7]. The former relates to motivation to perform tasks and the latter describes the way in which learners approach challenging tasks.

2. METHODOLOGY

In this study, we aim to adopt the framework of McGuire [3] and provide a mini-lesson to students on how to regulate their learning. Students are invited to participate in a 50-minute long workshop, designed to educate them on how they can regulate their learning. Through the workshop, we target to promote 1) goal setting; 2) self-awareness during studying; 3) growth mindset; 4) effective ways studying and doing homework

The intervention takes place at The University of British Columbia in the context of Math 110 (Differential Calculus). The class with the intervention was a group of 78 students. To analyze student perspectives on self-regulated learning two surveys are carried out, with one before the workshop and another after the workshop. The survey used a five point Likert scale for student responses to a variety of questions followed by an open-ended question for student comments. Response options were “strongly disagree” (SD), “disagree” (D), “neutral” (N), “agree” (A) and “strongly agree” (SA). Full details on the survey format, questions and ethics approval can be found in Appendix A.

3. RESULTS AND DISCUSSION

Surveys from the workshop were analyzed to understand changes in student perception and activities following the working. Questions were asked to students about their use of goal setting both before and after the workshop. Results pertaining to this are presented in figure 1. The figure shows slight shifts in students' opinion about their goal setting abilities, moving towards a less confident stance on their ability for goal setting. Goal setting behaviours may need to be reinforced and revisited more

regularly in order to show improvements in student perceptions.

Fig. 1: Responses to survey questions related to goal setting before and after the workshop.

Results from survey questions related to self-confidence and self-perception before and after the workshop are shown in figure 2. There is a general shift towards more positive responses on self-confidence and self-perception and a large shift away from the strongly disagree response. This indicates the workshop may aid students in feeling more confident in their abilities to learn. Responses from students in the open ended survey question indicate that they enjoyed the workshop and thought the materials were valuable. Given this, we believe that the students saw the techniques presented as helpful in assessing and modify their own learning behaviors.

Fig. 2: Responses to survey questions on self-perception and self-confidence before and after the workshop.

Responses to survey questions pertaining to minimizing distractions while studying before and after the workshop are presented in figure 3. There is no major shift in responses, but a small portion of students move from agree to neutral. The workshop appears to have little effect on student focus while studying in terms of minimizing distractions.

Fig. 3: Responses to survey questions related to minimizing sources of distraction before and after the workshop.

Figure 4 shows student responses to questions related to previewing lecture notes before class. There is a slight shift in responses toward neutral and agree, with the proportion of students strongly agreeing remaining the same. This may indicate a small effect on getting students to preview class materials before lecture, however this trend is not very strong. Some students noted in their open-ended comments that it is challenging to integrate new techniques into their study due to a busy schedule.

Fig. 4: Responses to survey questions on previewing class lecture noted before and after the workshop.

The workshop encourages students to rephrase new topics in order to improve their understanding of that topic. Students indicated whether they felt they used this technique both before and after the workshop and the results are reported in figure 5. Following the workshop students moved more towards agree with a lower proportion of the class selecting disagree or strongly agree. This may indicate more students are attempting this technique, as well as those who may have been strong users using it less so now.

Fig. 5: Responses to survey questions on rephrasing new topics learned before and after the workshop.

Students appear to be more comfortable asking for help from instructors and teaching assistants as shown in figure 6. There was a shift towards agree and strongly disagree from neutral. The training emphasized a growth mindset for students and to seek assistance when needed. This may have changed student attitudes towards seeking assistance.

Fig. 6: Responses to survey questions indicating comfort seeking help from instructors and teaching assistants before and after the workshop.

Though the iteration showed some improvement, the authors believe that it could be improved by being implemented over time in multiple sessions [4], [8]. Students commented that they would have liked to have the training session at the start of the semester rather than in the middle, as they appreciated the discussion and found the techniques useful.

4. CONCLUSION

Following the self-regulation workshop students report slightly greater student self-confidence, pre-lecture review and comfort seeking help from instructors. Students report less use of goal setting behaviours and little changes in minimizing distractions while studying and the use of rephrasing to practice key course concepts. Suggestions for improvements to this intervention are to spread training

between multiple sessions so as to better reinforce habits and attitudes related to self-regulated learning, as well as moving the initial training to the start of the semester.

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APPENDIX A: SURVEY QUESTIONS

Two surveys were issued to students using five point Likert scales for responses with response categories being "strongly disagree" (SD), "disagree" (D), "neutral" (N),

“agree” (A) and “strongly agree” (SA). The study strategy and survey was approved by a research ethics board. The reference number for this process was H17-02210. The first survey was given before the initial workshop. The second survey was given two weeks following the workshop. Questions for each survey are detailed below:

Survey 1

1. If I find the materials that I study uninteresting, I can still keep working on it for long.
2. I like coming to the lectures.
3. I think highly of myself, my expertise and my intelligence.
4. I can manage to do my studying in pre-specified chunks of time and stick to this plan.
5. I define some goals and manage to track them throughout my studies.
6. One of the most important problems I have is procrastination.
7. I often find myself surfing social media in the middle of my study sessions
8. When I am preparing for an exam, I just simply do not know where to start.
9. Most of my studying happens the night before the exam.
10. I try to teach or test myself (or someone else) to make sure I truly understand my studies.
11. I review my class notes before any new lecture
12. I try to rephrase my understanding of a new topic in my own words
13. When doing assignments, I try to find a similar example in the note or textbook.
14. I feel comfortable asking for help from instructors, TAs or my peers in my courses.
15. I am in university because I need a degree, not because I am interested in it
16. I suffer from exam anxiety

Table A1: Survey 1 student responses

	SD	D	N	A	SA
Q1	1	9	10	13	2
Q2	0	3	5	18	7
Q3	6	10	10	7	1
Q4	2	10	11	12	0
Q5	2	5	8	17	3
Q6	2	7	6	19	1
Q7	3	8	10	12	2
Q8	3	18	7	5	2
Q9	1	16	6	10	0
Q10	0	4	4	20	5
Q11	6	16	5	5	1
Q12	0	5	5	16	7
Q13	1	3	5	17	7
Q14	0	2	9	16	7
Q15	10	12	9	1	1
Q16	0	7	12	11	3

Survey 2

1. I managed fairly well to set SMART goals for my studying.
2. I think I have learnt an interesting field of knowledge.
3. I think highly of myself, my expertise and my intelligence.
4. I was able to minimize sources of distraction (phone, social media, etc)
5. I started my homework earlier.
6. I feel more self-aware of my studies.
7. I reviewed my class notes before any new lecture.
8. I try to rephrase my understanding of a new topic in my own words.
9. I sought help from instructors, TAs or my peers in my courses.

Table A2: Survey 2 student responses

	SD	D	N	A	SA
Q1	1	15	24	25	1
Q2	1	3	8	39	15
Q3	6	23	22	11	4
Q4	5	16	23	18	4
Q5	3	10	14	34	5
Q6	0	6	15	42	3
Q7	9	26	15	14	2
Q8	1	6	10	41	8
Q9	0	4	9	37	16