The Role of Task Value and Online Learning Strategies in an Introductory Computer Programming Course

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Abstract

The online learning environment continues to challenge the design of courses and their facilitation, and it requires learners to pick up newer strategies for regulating the learning process. This study focuses on identifying ways by which the task value of an online introductory programming course influences students' self-regulated learning skills. The task value of a course is the result of the perceived importance, utility, and interest of students who attend the course. Online learning strategies focus on self-regulated learning skills such as goal setting, environment restructuring, task strategies, time management, help-seeking, and self-evaluation. This study shows a relationship between the task value of the course and the self-regulated online learning skills employed by students. More specifically, this study indicates a relationship between a student's interest in the course contents and the reported ability to self-evaluate and seek-help during their online learning process. In addition, the survey results indicated that the course design features that ranks the highest in stimulating a students' interest in the course includes the online learning facilitation strategies and a hands-on learning process.
Keywords: Task-Value, Self-Regulated Learning, Computer-Programming, Self-Evaluation, Interest, Help-Seeking

1. INTRODUCTION

Although students today display increasing familiarity with online tools and communication technologies, many are unfamiliar with online learning methods. As a result, attrition rates in online learning can be twice as high as a traditional classroom format (Levy, 2007) (Boton & Gregory, 2015). In addition, lack of self-regulating ability is a significant reason for dropout rates in online courses (Lee & Choi, 2011).

Despite the many benefits of online learning methods, many challenges arise in the design and delivery of online course content. Course designers and instructors in an online learning environment find it challenging to sustain the learner's engagement throughout the learning period. In an online environment, active engagement is one of the design goals for the course contents that promote interaction between the learner-course contents, learner-learner, learner-instructor, learner-technology (Hanna, Glowacki-Dudka, & Conceição-Runlee, 2000). Design of course contents and course management strategies could enable students to perceive better task value and regulate their learning strategies.

Evidence from prior research shows that motivational constructs can explain achievement and learning behaviors. Based on expectancy-value theory, students' achievement behavior depends on their confidence to accomplish an academic task (self-efficacy) and the degree to which they value the task (task value) (Eccles & Alder, 1983) (Wigfield & Eccles, 2000). Task

value concerns learners' perspective of the task's interest, usefulness, and importance (Wigfield & Eccles, 2002). Interest in a task refers to the intrinsic value of enjoyment or intrinsic motivation for the task. The term usefulness stands for the student's perception that the task will be helpful to meet some future goals. The term importance stands for the attainment value or the value of doing well on the task. Studies report that students with a high value for the task employ more profound cognitive and metacognitive strategies (McWhaw & Abrami, 2001). Prior work has argued that task value is positively related to enjoyment, negatively related to boredom, and unrelated to academic performance (Noteborn et al., 2012).

Learners regarding high value for a task are more likely to persist and further endeavor in the same activity. Considering task value as one of the motivational factors, (Schunk, 2005) highlighted that the learners who feel a given task as related, essential, and valuable prefer to use cognitive strategies more often, leading to better learning outcomes.

Besides motivational factors, learning in an online environment requires students to use their autonomy and responsibility to self-monitor and regulate their learning process. Prior studies showed that learners struggle in online learning environments because they do not have the critical self-regulated learning (SRL) skills and strategies (Azevedo, 2007). Self-regulated learning has been described as an active, constructive process where learners plan and set goals before learning, monitor their learning progress, and then self-evaluate their performance after learning (Pintrich, 1999) (Zimmerman, 2008). A meta-analysis study reports a significant positive relationship between SRL strategies and online academic success (Broadbent & Poon, 2015). Studies have also shown that SRL skills not only regulate students' cognition but also motivational factors such as task-value (Butler & Cartier, 2005) (Pintrich, 2004).

Online learning environments come in a great variety, such as the Massive Open Online Courses (MOOCs), asynchronous learning, and even blended learning options. A recent study reports how task value and self-efficacy predict self-regulated learning in a MOOC environment, where there is little interaction between instructor and learners. In the current study, we look into the context of an introductory computer programming course delivered through a remote-online format. The remote-online format of course delivery combines live online lecture sessions with the asynchronous capability to support online discussions, grading, interactive exercises, feedback, and video lectures. Compared to a MOOC, the remote-online format supports online interaction between the instructor and learner through live video sessions, individualized feedback on coding submissions, office hours, and discussion boards.

This study intends to obtain students' perspectives on applying self-regulated learning skills in a remote online class of an undergraduate level introductory computer programming course. In addition to self-regulation, this study investigates students' task value of the course contents to identify a possible relationship between the perceived task value and the self-regulated learning skills. A previous study has investigated task value and SRL's impact on students' performance in a web-intensive engineering course (Lowanto, 2014). The results of this paper pertain to a remote-online course for an introductory programming course and the intent of this study is to identify how task value influences self-regulated learning strategies.

Prior studies have investigated the role of SRL in computer programming courses (Ramirez et al., 2018; Kumar et al., 2005; Castalennos et al., 2017). However, these studies have not considered the impact of an online learning environment that imposes a need for different types of online SRL strategies. Additionally, these studies have not investigated the correlation between task value and self-regulated learning.

2. THE STUDY

This study investigates the task value regarding the perceived interest, utility, and importance of course materials. It relates the task value to perceptions of self-regulated learning in an introductory Java programming course of an undergraduate program in Computer Information Systems in a public university. This study attempts to answer the following research questions:

1) To what degree did students exercise self-regulated learning strategies in a remote-online introductory programming course
2) What are the student perceived task value of the course contents
3) How does the self-reported task value of the course predict the self-reported scores of SRL reported by students who

are engaged in a remote-online introductory programming course.

Context

This study takes place in an undergraduate class where the contents are delivered using a remote online method. The students in this class, who are also the study participants, are regular campus students whose only option was to attend the remote-online class due to the Covid-19 pandemic. The introductory Java Programming course is a required pre-requisite for several higher-level Computer Information Systems courses. However, this is also a general education course that enrolls students who are non-majors. Students must attend a bi-weekly video session in a remote-online class and access the course materials via the learning management system. Learning materials include lecture slides, code demo videos, interactive practice exercises, weekly assignments, discussion boards, and instructor's feedback. Additionally, students are allowed to resubmit the assignments after obtaining the instructor's feedback. Students watch short pre-recorded videos before attending the regular video sessions. In addition, the instructor uses code demonstrations to explain the course concepts and demonstrate good coding practices.

Students regularly complete auto-graded practice quizzes that follow every lecture video. The lecture videos that introduce key concepts are short and do not exceed 15 minutes. The practice exercise also includes a series of coding assignments that require students to design and implement programs in Java using Eclipse- an integrated development environment (IDE) used throughout the course. The coding assignments are more significant projects for which students obtain feedback from the instructor to improve their solutions. Students communicate to the instructor via the online discussion board, emails, and office hours set up through zoom. The assignment submission drop box in the LMS affords ways to provide written and video feedback for the submissions.

The LMS has features that allow the instructor to set up deadlines and control access to submission drop boxes, quizzes, and assignments. The calendar system in LMS also provides submission reminders on the course page. In addition, students visit the course pages several times a week to keep track of the tasks and due dates.

The online discussion boards allows students to interact with the rest of the class.

Survey Instruments

Seventeen students consented to participate in an end-of-the-course survey. Student identities are anonymous in the survey. The students who attended the surveys consisted of freshman and sophomores. Seventeen respondents answered all the survey questions, and they accessed the survey anonymously using an online survey tool.

The survey instrument includes an Online Strategies for Learning Questionnaire (OSLQ), a 24 item questionnaire that evaluates students' SRL skills in an online learning environment (Barnard, 2008). The OSLQ consists of six subscales – goal setting, environment restructuring, task strategies, time management, help-seeking, and self-evaluation. The subscales of OSLQ map into Zimmerman's SRL model (Zimmerman, 1998), consisting of forethought, performance, and self-reflection phases. The goal-setting and environment restructuring phase correspond to the forethought phase of Zimmerman's SRL model. The subscales of task strategies, time management, and help-seeking correspond to the performance phase of the SRL model. As the name suggests, the self-evaluation subscale measures the self-evaluation phase of Zimmerman's SRL model. The OSLQ asks students to rate their responses on a scale of 1(‘not-at-all-like-me”) to 5(“very-much-like-me”). Appendix A shows the subscales and items in the OSLQ used in this study.

The internal reliability of OSLQ, as indicated by Cronbach's alpha value, is 0.90 for the overall questionnaire and between 0.85 and 0.92 for the subscales (Barnard-Brak, Paton & Lak, 2008). In the current study involving OSLQ and consisting of 17 responses, the Cronbach's coefficient value is 0.89 for the entire set of questions. In addition, the reliability of the subscales is sufficient with an alpha of 0.73, 0.83, 0.76, 0.47, 0.61, 0.71, for goal setting, environment restructuring, task strategies, time management, help-seeking, and self-evaluation, respectively.

The survey contains six questions that measure the perceived task value of course contents. These questions are part of a Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich et al., 1991). Appendix B shows the task value subscale of the MSLQ. In addition to the task value scale, the survey also includes a series of ranking questions created by the author to discover how various critical features of the course content shape students' perceived importance, utility, and interest. Students rank the answer choices on a scale of 1 (most important/useful/interesting) to 5 (least

important/useful/interesting). Please refer to Appendix C for the ranking questions. This survey component helps the instructor pinpoint the course design's important aspects contributing to the perceived task value.

3. RESULTS

Before analyzing the survey results, the author of this paper inspected the data to find and remove any incomplete attempts. The online survey tool had features that could control the ranking questions' irregularities, such as using the same rank value for two different answer choices.

SRL in an Online Learning Environment

Cronbach's alpha value provides the reliability of the 24-item survey instrument on online learning strategies. The Cronbach's alpha value varied between 0.47 and 0.83 for the six subscales. A high value of alpha indicates a higher inter-relatedness of the items (Taber, 2008).

	Mean	Std.Dev	Cronbach's α
Goal Setting	3.8	0.72	0.73
Environment Restructuring	3.76	1	0.83
Task Strategies	3.25	0.87	0.76
Time Management	3.67	0.74	0.47
Help Seeking	3.1	0.83	0.61
Self Evaluation	3.21	0.89	0.71
Total SRL Score	**3.51**	**0.6**	**0.89**

Table 1. Mean scores and reliability of the online SRL subscales.

Table 1 indicates a total mean score of 3.51 for the SRL/online learning strategies on a scale of 1-5. Appendix A shows the details of the student responses for every item in the questionnaire. Even though there were only 17 students who fully responded to the questionnaire, the responses, as verified by Kolmogorov-Smirnoff's test, were normally distributed for every item. Based on the responses, students' perceptions of their forethought phase that includes goal setting, environment restructuring, and task strategies are, on the whole, higher than their ability to apply time management and help-seeking during the performance phase of SRL.

Task Values

The survey measures the task value of the course contents on a scale of 1(strongly disagree) - 7(strongly agree), using the task value subscale of the MSLQ questionnaire. Appendix B shows the items, scales, and student responses for each item. Table 2 shows the (weighted) mean scores for importance, utility, and interest. The mean task value score is 6.04, which indicates a high value. All 17 students attempted this set of questions. Through their responses, students express why they felt the course contents are important, useful, and interesting by answering a series of ranking questions on a scale of 1(most important/useful/interesting) – 7 (least important/useful/interesting). Appendix C shows the percentage of student responses for each score. Some of the responses were completed only by 16 out of 17 students.

	Mean	Std.Dev	Cronbach's α
Importance	6.47	0.60	
Utility	6	0.75	
Interest	5.65	1.32	
Total Task Value Score	**6.04**	**0.74**	**0.76**

Table 2. Task Value Scores

Tables 3, 4, and 5 show the weighted average scores for each of the ranking questions. The majority of the responses occurred in the middle of the 1-5 scale. Please note that the ranking questions may only constitute a sample of the course related factors that indicate importance, utility and interests. Therefore, the scores of questions in Appendix C were not aggregated to produce the scores of importance, utility or interests indicated by Table 2.

Please rank each of the choices on a scale of 1 - 5 on why this course is <u>important</u> to you. On the 1-5 scale, 1 stand for (most important) and 5 stands for (least important).		
	Weighted Avg	Rank
It is a required course	2.71	3
It allows me to learn how to write computer programs	2.63	2
It improves the chances of getting a job	2.56	1
It allows me to understand how a programming solution is constructed using logical elements	2.94	4
It makes me successful in future classes	4.06	5

Table 3: Ranking question on why the course is important.

When asked why the course is important to them, the weighted average scores did not vary by more than 0.4 points for most of the ranked items. However, the response that the course would make them successful in future courses was the least ranked and had a higher score value that differed by more than one point on the 1-5 scale.

Even though the introductory programming course is a pre-requisite for many other upper-level courses in the CIS program, it is also a general education course that enrolls non-majors. Non-majors may not require introductory programming for their future courses. The fact that this is a required course was ranked at a 3 (out of a 5) on the ranking scale. Many of the non-majors attend this class to build programming skills that is indicated by the item in rank 1; the course work improves the chances of getting a job. Perhaps future iteration of the course design could leverage this motivational aspect and include contents that show how various programming concepts are part of real-world applications.

Table 4 shows the ranking for items that ask students why the course is useful to them. Once again, no wide variation in the average score is apparent.

Please rank each of the choices on a scale of 1 - 5 on why this course is <u>useful</u> to you. On the 1-5 scale, 1 stands for (most useful), and 5 stands for (least useful).		
	Weighted Avg	Rank
I learnt how to write and test Java programs using Eclipse	3.13	3
I improved my problem solving skills by writing programs	2.31	1
I can apply what was learnt in this class in future courses	3.44	5
I have developed skills to evaluate the correctness of my programs	3.41	4
I have gained skills on how to translate the requirements in the problem to programming solutions	2.69	2

Table 4. Ranking questions on why the course is useful.

It seems as if students focus on the usefulness of the course based on problem-solving and programming skills they have picked up. Future course design could focus on ways to recognize the course contents students would have mastered and specific skills that they would have picked up through the course. Even though this is an introductory level foundation course, students do not find as much utility in making them successful in future courses.

Table 5 shows the ranking for items that ask students why the course is interesting to them. For example, in Table 5, ranks 1 and 2 pertain to the facilitation of the course. The lower ranks pertain to the steps required to complete a coding assignment, including using Eclipse IDE to complete programs.

Correlation between Task Value and SRL

Data collected from the survey reveals a strong positive correlation between the aggregate SRL and task value scores. Additionally, there was a significant correlation between the aggregate task value score and two subscales – help-seeking and self-evaluation components of SRL identified by the OSLQ.

Please rank each of the choices on a scale of 1 - 5 on why this course is <u>interesting</u> to you. On the 1-5 scale, 1 stands for (most interesting) and 5 stands for (least interesting).		
	Weighted Avg	Rank
I liked the way the course was facilitated (eg: code demos, videos, self-assessment quizzes, and multiple submissions for assignment)	2.13	1
I found it interesting to learn programming by completing the module assignment questions.	3.06	3
I enjoyed the hands-on learning process	2.63	2
I enjoy learning how the basic programming constructs such as the decision structures, loops, and objects are used in real-world applications	3.06	3
I enjoyed working with Eclipse	4.06	4

Table 5. Ranking questions on why the course is interesting.

Self-evaluation requires the ability to reflect upon one's SRL strategy to make improvements. The correlation results show that students with a high

task value also tend to apply self-evaluation strategies in their online learning process. Additionally, these students also tend to use help-seeking strategies to self-regulate their online learning.

Table 6 shows the values of the Spearman Correlation co-efficient, ρ for values pf p<0.005.

Significant Correlations	(ρ , p)
SRL aggregate and Task Value aggreate	(0.58 , 0.01)
SRL - Help Seeking subscale and Task Value aggregate	(0.7 , 0.001)
SRL - Self Evaluation subscale and Task Value aggregate	(0.68, 0.002)
SRL aggregate and Task Value-interest subscale	(0.54 , 0.02)

Table 6. SRL – Task Value Correlations

Again, no significant correlation exists between task value score and other subscales of the SRL responses. A significant positive correlation exists between SRL and the interest component of task value. The ranking of the interest scale in Table 5 shows that the course design and facilitation methods play an essential role in a student's perceived task value and correlate with the student's online SRL strategies.

Regression analysis reveals a linear relationship between the task value score and the aggregate SRL score (obtained from the OSLQ responses), as shown in Table 7. Further investigation of the SRL subscales reveals a regression equation between self-evaluation scores and the aggregate task value scores.

SRL_aggregate Score = 0.89 + 0.434*TaskValue_aggregateScore
Goodness of fit: Overall regression: right-tailed, F(1,15) = 6.201, p-value = 0.025.
R-square = 0.292-> Task value predicts 29.2% of the variance of SRL_SelfEvaluation_Score
Residual Normality : Shapiro Wilk p-value = 0.218 --> data is normally distributed.

Table 7. SRL - Task Value Regression

Table 8 shows the regression equation that relates the self-evaluation component of SRL scores and the aggregate task value.

SRL_SelfEvaluation_Score = -0.64 + 0.64TaskValue
Goodness of fit: Overall regression: right-tailed, F(1,15) = 11.084, p-value = 0.0045.
R-square = 0.425 -> Task value predicts 42.5% of the variance of SRL_SelfEvaluation_Score
Residual Normality : Shapiro Wilk p-value = 0.609. --> data is normally distributed.

Table 8. SRL_Self Evaluation- Task Value Regression

Table 9 shows the regression equation between the SRL-self-evaluation scores and the interest component of the task value score.

SRL_SelfEvaluation_Score = 1.31 + 0.34 *TaskValue_Interest_Subscale
Goodness of fit: Overall regression: right-tailed, F(1,15) = 9.099, p-value = 0.00867479.
R-square = 0.377 -> Task value interest subscale predicts 37.7% of the variance of SRL_SelfEvaluation_Score
Residual Normality: Shapiro-Wilk p-value = 0.353 --> data is normally distributed.

Table 9. SRL Self Evaluation – Task Value Interest Regression

SRL_HelpSeeking_Score = -1.14 + 0.70*TaskValue
Goodness of fit: Overall regression: right-tailed, F(1,15) = 9.674, p-value = 0.0072.
R-square = 0.392-> Task value predicts 39.2% of the variance of SRL_SelfEvaluation_Score
Residual Normality : Shapiro Wilk p-value = 0.062. --> data is normally distributed.

Table 10. SRL_Help Seeking – Task_Value(aggregate) Regression

Results from Table 7 implies that students' task value predicts their SRL skills. Table 8 shows that task value specifically predicts the self-evaluation strategies used by students. Table 9 indicates that the interest component of task value is related to the self-evaluation component of the SRL score. Finally, the regression equation in Table 10 shows that the perceived task value of the course content influences the help-seeking strategies used by students.

4. DISCUSSION

The introductory programming course, which forms the context of this study, is a required foundational course for Computer Information Systems majors. At the same time, this course is also a choice for non-majors to meet the requirements for general education. Therefore, the survey results indicate how the career potential of computer programming ranks the highest for why this course important. However, the rankings in Table 3 shows that students do not give as much importance to the fact that this is a critical course that could make them successful in future courses. Items from Table 4 indicate that the improvement in problem-solving skills ranks high on why the course is helpful to students.

The reasons for interest in the course, as shown in Table 5, indicate that students depend on the engagement afforded by the course design and facilitation methods for regulating their interest in the course. More than what they learned through the course contents, their interest depended on how they learned. However, this does not mean that what they learn from the course is less beneficial to them. For instance, rankings in Table 4 indicate that the programming course's utility is ranked the highest for the skills students develop through the course.

This study takes place in a small classroom from which only 17 students fully participated in the survey. A small sample size limits the generalizability of the findings even among introductory programming courses. Despite its limitations, this study has developed a method to study the relationship between online learning strategies and task value using well-known and validated survey instruments that can apply across multiple contexts and online course delivery methods. A comparative study across multiple disciplines and online delivery mediums will be a valuable direction to pursue future studies.

5. CONCLUSIONS

This study elicits student perceptions of their SRL skills and task value of course contents in a remote-online learning environment for an introductory computer programming course. Course-specific factors that influence the perceived task value regarding importance, utility, and interest for the course could guide the future redesign of the online learning experience. Regression studies indicate that there are a relationships between the perceived interest in the course and the tendency of students to seek help and self-evaluate their learning process. Student responses rank a well-facilitated, hands-on learning experience as important factors for making the course interesting to them.

Online learning continues to challenge ways in which students employ self-regulated learning. Students' lack of face-to-face interaction and increased autonomy and responsibility requires them to develop newer SRL strategies in an online learning environment. Therefore, developing strategies to increase the course content's task value could motivate students to develop newer online learning strategies.

6. ACKNOWLEDGEMENTS

The author would like to thank and acknowledge the PASSHE-FPDC grant for funding the instructor during summer 2019. The grant funding helped the author acquire the required professional development on the Self-Regulated Learning, and Learning Design Study applied in this study.

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ISSN 2473-4901
v7 n5577

Appendix A

This set of questions requires you to self-assess your competency in various aspects of self-regulated learning. Please note that the use of the term "online" in some of the questions are synonymous with "remote-online"Please provide responses to the following questions on a 1 to 5 scale where 1 stands for " Not at all like me" and 5 stands for "Very much like me"												
Goal Setting												
	5- Very much like me		4		3		2		1- Not at all like me		Total	Weighted Average
I set standards for my assignments in online courses.	23.53%	4	47.06%	8	23.53%	4	5.88%	1	0.00%	0	17	3.88
I set short-term (daily or weekly) goals as well as long-term goals (monthly or for the semester).	17.65%	3	47.06%	8	29.41%	5	0.00%	0	5.88%	1	17	3.71
I keep a high standard for my learning in my online courses	35.29%	6	41.18%	7	17.65%	3	0.00%	0	5.88%	1	17	4
I set goals to help me manage studying time for my online courses.	23.53%	4	35.29%	6	29.41%	5	5.88%	1	5.88%	1	17	3.65
I don't compromise the quality of my work because it is online	29.41%	5	23.53%	4	35.29%	6	5.88%	1	5.88%	1	17	3.65
												3.778
Environment Restructuring												
I choose the location where I study to avoid too much distraction.	37.50%	6	18.75%	3	18.75%	3	25.00%	4	0.00%	0	16	3.69
I find a comfortable place to study.	41.18%	7	17.65%	3	17.65%	3	17.65%	3	5.88%	1	17	3.71
I know where I can study most efficiently for online courses.	35.29%	6	47.06%	8	11.76%	2	5.88%	1	0.00%	0	17	4.12
I choose a time with few distractions for studying for my online courses.	29.41%	5	41.18%	7	5.88%	1	23.53%	4	0.00%	0	17	3.76
												3.82
Task Strategies												
I try to take more thorough notes for my online courses because notes are even more important for learning online than in a regular classroom.	29.41%	5	23.53%	4	41.18%	7	5.88%	1	0.00%	0	17	3.76
I read aloud instructional materials posted online to fight against distractions.	23.53%	4	35.29%	6	11.76%	2	5.88%	1	23.53%	4	17	3.29
I prepare my questions before joining in the chat/zoom room and discussions.	11.76%	2	23.53%	4	47.06%	8	11.76%	2	5.88%	1	17	3.24
I work extra problems in my remote online courses in addition to the assigned ones to master the course content.	11.76%	2	17.65%	3	58.82%	10	5.88%	1	5.88%	1	17	3.24
Time Management												**3.3825**
I allocate extra studying time for my online courses because I know it is time-demanding	23.53%	4	47.06%	8	23.53%	4	5.88%	1	0.00%	0	17	3.88
I try to schedule the same time everyday or every week to study for my online courses, and I observe the schedule.	23.53%	4	29.41%	5	29.41%	5	11.76%	2	5.88%	1	17	3.53
Although we don't have to attend daily (in-person) classes, I still try to distribute my studying time evenly across days.	12.50%	2	50.00%	8	31.25%	5	6.25%	1	0.00%	0	16	3.69
Help Seeking												**3.7**
I find someone who is knowledgeable in course content so that I can consult with him or her when I need help.	23.53%	4	41.18%	7	5.88%	1	23.53%	4	5.88%	1	17	3.53
I share my problems with my classmates online so we know what we are struggling with and how to solve our problems.	17.65%	3	29.41%	5	23.53%	4	23.53%	4	5.88%	1	17	3.29
If needed, I try to meet my classmates face-to-face.	11.76%	2	5.88%	1	17.65%	3	35.29%	6	29.41%	5	17	2.35
I am persistent in getting help from the instructor through e-mail and regular zoom-sessions.	11.76%	2	29.41%	5	35.29%	6	17.65%	3	5.88%	1	17	3.24
Self Evalutaion												**3.1025**
I summarize my learning in online courses to examine my understanding of what I have learned.	17.65%	3	41.18%	7	41.18%	7	0.00%	0	0.00%	0	17	3.76
I ask myself a lot of questions about the course material when studying for an online course.	18.75%	3	50.00%	8	18.75%	3	12.50%	2	0.00%	0	16	3.75
I communicate with my classmates to find out how I am doing in my online classes.	11.76%	2	11.76%	2	41.18%	7	29.41%	5	5.88%	1	17	2.94
I communicate with my classmates to find out what I am learning that is different from what they are learning.	11.76%	2	29.41%	5	23.53%	4	29.41%	5	5.88%	1	17	3.12
												3.3925

OSLQ questionnaire and responses were used to rate various SRL skills.

ISSN 2473-4901
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APPENDIX B

Please answer this question on a scale of 1-7 where 1 stands for "Strongly disagree" and 7 stands for "Strongly agree".																
Importance	7-Strongly Agree		6		5		4		3		2		1-Strongly Disagree		Total	Weighted Average
It is important for me to learn the course material in this class.	58.82%	10	41.18%	7	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	17	6.59
Understanding the subject matter of this course is very important to me.	47.06%	8	47.06%	8	0.00%	0	5.88%	1	0.00%	0	0.00%	0	0.00%	0	17	6.35
Utility																
I think I will be able to use what I learn in this course in other courses.	35.29%	6	35.29%	6	23.53%	4	5.88%	1	0.00%	0	0.00%	0	0.00%	0	17	6
I think the course material in this class is useful for me to learn	35.29%	6	47.06%	8	5.88%	1	5.88%	1	5.88%	1	0.00%	0	0.00%	0	17	6
Interest																**6**
I am very interested in the content area of this course.	41.18%	7	17.65%	3	17.65%	3	17.65%	3	5.88%	1	0.00%	0	0.00%	0	17	5.71
I like the subject matter of this course.	41.18%	7	17.65%	3	17.65%	3	11.76%	2	5.88%	1	5.88%	1	0.00%	0	17	5.59
																5.65

Task Value subscale of MSLQ questionnaire and survey results

ISSN 2473-4901
v7 n5577

APPENDIX C

Please rank each of the choices on a scale of 1 - 5 on why this course is important to you.
On the 1-5 scale, 1 stand for (most important) and 5 stands for (least important).

	1- Most Important		2		3		4		5 - least Important		Weighted Avg
It is a required course	47.06%	8	0.00%	0	17.65%	3	5.88%	1	29.41%	5	2.71
It allows me to learn how to write computer programs	0.00%	0	56.25%	9	25.00%	4	18.75%	3	0.00%	0	2.63
It improves the chances of getting a job	25.00%	4	31.25%	5	12.50%	2	25.00%	4	6.25%	1	2.56
It allows me to understand how a programming solution is constructed using logical elements	29.41%	5	5.88%	1	23.53%	4	23.53%	4	17.65%	3	2.94
It makes me successful in future classes	0.00%	0	6.25%	1	25.00%	4	25.00%	4	43.75%	7	4.06

Please rank each of the choices on a scale of 1 - 5 on why this course is useful to you.
On the 1-5 scale, 1 stands for (most useful), and 5 stands for (least useful).

	1-Most Useful		2		3		4		5-Least Useful		Weighted Avg
I learnt how to write and test Java programs using Eclipse	31.25%	5	6.25%	1	12.50%	2	18.75%	3	31.25%	5	3.13
I improved my problem solving skills by writing programs	18.75%	3	50.00%	8	12.50%	2	18.75%	3	0.00%	0	2.31
I can apply what was learnt in this class in future courses	12.50%	2	6.25%	1	37.50%	6	12.50%	2	31.25%	5	3.44
I have developed skills to evaluate the correctness of my programs	5.88%	1	17.65%	3	23.53%	4	35.29%	6	17.65%	3	3.41
I have gained skills on how to translate the requirements in the problem to programming solutions	31.25%	5	18.75%	3	18.75%	3	12.50%	2	18.75%	3	2.69

Please rank each of the choices on a scale of 1 - 5 on why this course is interesting to you.
On the 1-5 scale, 1 stands for (most interesting) and 5 stands for (least interesting).

	1-Most Interesting		2		3		4		5-Least Interesting		Weighted Avg
I liked the way the course was facilitated (eg: code demos, videos, self-assessment quizzes, and multiple submissions for assignment)	25.00%	4	50.00%	8	18.75%	3	0.00%	0	6.25%	1	2.13
I found it interesting to learn programming by completing the module assignment questions.	25.00%	4	0.00%	0	25.00%	4	43.75%	7	6.25%	1	3.06
I enjoyed the hands-on learning process	18.75%	3	31.25%	5	18.75%	3	31.25%	5	0.00%	0	2.63
I enjoy learning how the basic programming constructs such as the decision structures, loops, and objects are used in real-world applications	25.00%	4	18.75%	3	12.50%	2	12.50%	2	31.25%	5	3.06
I enjoyed working with Eclipse	5.88%	1	0.00%	0	29.41%	5	11.76%	2	52.94%	9	4.06

Task Value – Ranking Questions on why the course is important, useful, and interesting, along with the survey results.