

EFFECT OF SOLICITED TEACHER FEEDBACK ON SELF-REGULATED LEARNING OF MALAYSIAN UNDERGRADUATES

TamilSelvan Ramis¹
Loh Sau Cheong²

^{1,2} Department of Educational Psychology and Counseling, Faculty of Education, University of Malaya

Accepted date: 06-01-2019

Published date: 11-03-2019

To cite this document: Ramis, T., & Loh, S, C. Effect of Solicited Teacher Feedback on Self-Regulated Learning of Malaysian Undergraduates. *International Journal of Education, Psychology, and Counselling*, 4 (24), 97-113.

Abstract: Developing self-regulated learners is one of the mandates of modern education. Though a general trend of decreasing students' perceived self-regulation from primary to secondary school has been recorded internationally, and university students do not report having optimal self-regulated learning. Teacher feedback is shown to be an inherent catalyst of students' self-regulated learning. However, the role of more tailored, targeted feedback towards specific challenges faced by students in facilitating students' self-regulated learning are still under-researched. As such, the current study aimed to examine the role of solicited teacher feedback in facilitating students' self-regulated learning. A randomized pretest-posttest experimental design was employed in this study. A total of 121 psychology undergraduates from a Malaysian private university received either solicited teacher feedback or unsolicited teacher feedback over the course of an academic semester. The students' self-regulated learning was measured using the Motivated Strategies for Learning Questionnaire (MSLQ). The results revealed that participants in the solicited teacher feedback condition reported a significantly greater level of metacognitive and behavioral components of self-regulated learning as compared to participants in the unsolicited teacher feedback condition, after controlling for pre-manipulation level of self-regulated learning. However, there was no significant difference in the motivational component of self-regulated learning between students who are given solicited teacher feedback and students who are given unsolicited teacher feedback, after controlling for pre-manipulation level of self-regulated learning. The findings of the study attest to the importance of solicited teacher feedback in enhancing students' self-regulated learning and provide unique insights on the role of teacher feedback in cultivating students' self-regulated learning in the Malaysian university context.

Keywords: Solicited Teacher Feedback, Self-Regulated Learning, Teacher Feedback

Introduction

Lifelong learning is universally emphasized as the demand of modern society. This emphasis is seen through various ingenuities such as the World Initiative on Lifelong Learning developed by a large coalition of multinational businesses, educationalists, and international organizations like United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Organization for Economic Co-operation and Development (OECD) (Longworth & Davies, 1996; Stewart & Ball, 1995). The Education Ministry of Malaysia has also recognized the importance of lifelong learning and has incorporated it in its process of reviewing the 2007-2020 National Higher Education Strategic Plan (Ministry of Higher Education, 2011). As such, an essential aim of today's education including higher education is to develop self-regulated learners who are actively engaged in their own learning process during and after schooling, and throughout one's life.

Self-regulated learning refers to the degree to which students are metacognitively, motivationally, and behaviorally active participants in their own learning process (Zimmerman, 1986). Promotion of self-regulated learning is hoped to address one of the greatest challenges that teachers face today, which is how to help students learn intentionally, autonomously, and effectively (Panadero & Alonso-Tapia, 2014). More than three decades of research on ways to promote self-regulated learning in students has shown that external feedback such as teacher feedback to be an inherent catalyst of students' self-regulated learning (Butler & Winne, 1995).

Students' Self-Regulated Learning and Teacher Feedback

The significance of self-regulation in academics is well recognized in educational psychology literature (Paris & Paris, 2001; Schunk & Ertmer, 2000). Specifically, a considerable amount of research has shown self-regulation to be one of the most powerful predictors of academic motivation and achievement regardless of students' gender, ethnicity, socioeconomic status, and academic areas (Boekaerts, Pintrich, & Zeidner, 2000; Kitsantas, Dabbagh, Hiller, & Mandell, 2015; Pintrich, 2003). Students who are trained in self-regulation processes such as goal setting, self-monitoring, and self-reflection during their learning display greater levels of motivation and achievement (Boekaerts, Pintrich, & Zeidner, 2000; Pintrich, 2003; Schunk, 1996; Wood, Bandura, & Bailey, 1990; Zimmerman & Martinez-Pons, 1990). Furthermore, the meta-analysis by Dignath and Büttner (2008) which included 84 studies and 357 effect sizes on the association between self-regulated learning and academic achievement of primary and secondary school students revealed a large average effect size of 0.69, again demonstrating the importance of self-regulated learning for academic achievement.

While self-regulated learning is stressed as a mandate of the modern society, there is an international trend of decreasing students perceived self-regulation from primary to secondary school (Caprara et al., 2008; Helle, Laakkonen, Tuijula, & Vermunt, 2013; Mok, Fan, & Pang, 2007; Pajares & Valiante, 2002). This decrease then persists as the students pursue their tertiary education in universities. Likewise, Bembenuatty (2008) reported that many university students are not effective self-regulated learners. Dunlosky and Rawson (2012) also claim that students who have difficulty engaging in self-regulated learning are often disadvantaged by inaccurate monitoring.

Feedback also plays an important role in students' academic achievement. Teacher feedback is defined as the information that is communicated to students about their present state of learning and performance, and how they match to the relevant goals and standards (Nicol & Macfarlane-

Dick, 2006). Hattie and Timperley's (2007) review of 12 meta-analyses which included 196 studies and 6,972 effect sizes on the influences of feedback on achievement reported an average effect size of 0.79, twice the typical effect of schooling of 0.40. This large effect size suggests that feedback is one of the most powerful influences of students' learning and achievement. Furthermore, feedback is essential to be investigated in the context of self-regulated learning as a series of research has demonstrated that students' self-regulated learning can be enhanced through social guidance and feedback (Schunk & Swartz, 1993).

Teacher Feedback Interventions to Enhance Students' Self-Regulated Learning

Johansen and Tennyson (1983) investigated the effect of adaptive advisement on students' perception of learning in a learner-controlled, computer-based instruction using a punctuation rule-learning task. Advisement refers to feedback about one's current comprehension levels and advice about ways to further engage in learning. They had three conditions namely advisement-learner control condition in which the students received an introductory computer-based instruction with an initial assessment followed by a learner-controlled section that involved advisement information, a partial learner-control condition in which the students received an introductory computer-based instruction with an initial assessment followed by a learner-controlled section without advisement information, and a conventional learner-control condition in which the students received continuous instruction with complete learner control. The authors found that students in the advisement-learner control condition learned the rules better and persisted on the task more by studying the examples than their counterparts in the other two conditions.

Steinberg's (1989) literature review on learner control in computer-assisted instruction provides further support for the positive effect of advisement on students' self-regulated learning. Advisement is a unique form of feedback in that it offers ways to help students to cognitively engage with the learning tasks as opposed to providing content information alone. Steinberg's review reveals that when students are given complete learning control without advisement, they tend to exit the task prematurely, probably due to ineffective monitoring about their progress and strategies to persist in the task. The review further suggests that students are likely to persist and perform better in the task if they are provided with advisement information.

Balzer, Doherty, and O'Connor (1989) conducted a comprehensive review of the empirical literature on the effects of cognitive feedback on performance. Cognitive feedback refers to the process of providing a person with (1) task information – information about the relations in the environment, (2) cognitive information – information about the relations perceived by the person, and (3) functional validity information – information about the relations between the environment and the person's perception of the environment. The authors' review suggests that cognitive feedback might enhance one's self-regulated learning by supporting the process of meta-monitoring in them. Similarly, Meyer's (1986) review of the empirical literature on teacher feedback to students' errors including lack of information errors, motor errors, confused information errors, and rule application errors underscores the importance of teacher feedback in facilitating students' cognitive processing (a crucial element of self-regulated learning), and ultimately in correcting students' comprehension.

Schunk and Swartz (1993) conducted two experiments to examine how goal setting and progress feedback affect students' self-regulated learning, self-efficacy particularly, and writing achievement. The students received writing strategy instruction and were given either a process goal of learning the strategy, a product goal of writing paragraphs, or a general goal

(instructional control) to guide their self-directed writing practice. Half of the students who were given a process goal of learning the strategy also received verbal teacher feedback on their progress in learning the strategy, about three to four times during each instructional session. Results revealed that students who were given a process goal of learning the strategy and teacher feedback exhibited a greater level of self-regulated learning compared to students in the other three conditions (no teacher feedback). The former students also exhibited greater levels of self-efficacy, strategy use while writing, and writing achievement. The authors further found that the enhanced self-regulated learning as a result of the process goal of learning the strategy with teacher feedback persisted six weeks after the intervention.

More recently, through two experimental studies, Llorens, Vidal-Abarca, and Cerdan (2016) examined the effects of formative feedback on students' transfer of self-regulation of task-oriented reading strategies. The students were instructed to read and answer multiple-choice comprehension questions while receiving consistent feedback about their performance and strategic decisions. They then were requested to perform the same task without receiving any feedback. The authors found that students were able to transfer self-regulated learning strategies to a superior extent when they were given formative feedback compared to when they were not. Collectively, these studies reinforce the importance of feedback in facilitating students' self-regulated learning. However, these studies have focused on traditional top-down unsolicited teacher feedback as opposed to solicited teacher feedback.

More locally, Ng, Bakar, Roslan, Wong, and Rahman (2005) studied the relationship between self-regulated learning and student-teacher interactions in Malaysia. They proposed that student-teacher interactions in relation to self-regulated learning consist of three components including student-centered learning, feedback provided by teachers, and strategy-instruction. They found that student-teacher interactions, specifically student-centered learning and strategy instruction, are positively related to students' self-regulated learning. Interestingly, the authors found that there was no significant relationship between feedback provided by teachers and students' self-regulated learning. As this was inconsistent with an extensive body of research on self-regulated learning, the authors have called for more studies to examine this relationship. It is also essential to note that Ng et al. (2005)'s feedback items focused on unsolicited teacher feedback and the relationship may very well change when solicited teacher feedback is taken into consideration.

A Case for Solicited Teacher Feedback

Teacher feedback, especially solicited teacher feedback in which students explicitly request for teachers' feedback in areas the former find challenging, can be helpful in developing students' self-regulated learning. Solicited feedback would encourage students to better monitor their work and seek appropriate feedback from their teachers. Following an extensive analysis, Butler and Winne (1995) suggest that external feedback on students' domain understandings help them generating monitoring information, especially about cues that students can use to regulate learning. That is, the students will be able to gauge their progress relative to their goals and generate feedback that guides further action. Self-regulated learning researchers have proposed that teachers' feedback helps students in determining the accuracy of their self-monitoring (Schunk, 2000; Zimmerman, Bonner, & Kovach, 1996). Such teacher feedback would aid the self-judgmental subfunction proposed by Bandura (1986) by providing evaluative information as well. Existing research on the effect of teacher feedback on students' self-regulated learning has focused predominantly on top-down, unsolicited teacher feedback. That is, even with the emphasis on student-centered learning as the significant pedagogy in

contemporary educational institutions, feedback is seen as a process of one-way information transmission dominated by teachers (Nicol & Macfarlane-Dick, 2006). This one-way transmission of feedback does not give sufficient consideration to challenges faced by students during academic tasks and ultimately denies the opportunity for students to be active participants in their own learning process. As the practice of solicited feedback will provide further opportunity for students to be more active participants in their own learning, the effect of solicited teacher feedback is worth investigating next.

Moreover, it is critical to explore ways to enhance self-regulated learning of university students particularly, as most of the university students' learning happens outside of the classroom (Hofer, Yu, & Pintrich, 1998). The university students need to learn to be motivationally, metacognitively, and behaviorally active participants in their own learning process in order to excel in their academic courses. Ning and Downing (2015) claim that in contrast to primary and secondary education, university education demands students to be more proactive, self-disciplined, and be able to control their own learning via self-monitoring and self-evaluation. Examining how effective teacher feedback would help the university students to develop a greater self-regulated learning skill thus becomes imperative.

Research Purpose

Given that developing students' self-regulated learning is an important mandate of modern education and that many university students are not effective self-regulated learners, it is essential to find more effective ways of promoting the students' self-regulated learning. This research aspired to do exactly that. Specifically, the research aimed to study the effect of teacher feedback that is more tailored towards the specific challenges faced by students while working on academic tasks on students' self-regulated learning. This type of feedback is in contrast to the traditional top-down feedback process that is dominated by teachers and has minimal involvement of the students; it provides greater opportunities for students to engage in self-regulatory subfunctions such as self-observation and judgmental process proposed by Bandura (1986). It was hypothesized that there will be a significant difference in motivational, metacognitive, and behavioral components of self-regulated learning between students who are given solicited teacher feedback and students who are given unsolicited teacher feedback, after controlling for pre-manipulation level of self-regulated learning.

Method

Research Design

A quasi-experimental research with a randomized pretest-posttest design was employed in this study. The independent variable was type of teacher feedback, with solicited teacher feedback and unsolicited teacher feedback as the levels of the independent variable. The participants were randomly assigned to either of the two conditions. The dependent variables were motivational, metacognitive, and behavioral components of students' self-regulated learning. Pre-manipulation level of self-regulated learning served as the covariate.

Participants

A total of 135 undergraduates who were enrolled in a first-year psychology research module in a Malaysian private university were recruited for the study. Sixty-seven participants were assigned to the solicited feedback condition and sixty-eight participants were assigned to the unsolicited feedback condition. Fourteen of the participants (nine from solicited feedback condition and five from unsolicited feedback condition) dropped out through the course of the

study. As such, only data from 121 participants were included in the analysis. The final sample of the current study consisted of 99 women and 22 men participants with a mean age of 20.33 years old ($SD = 1.02$). 75.2% of participants identified as Chinese, 10.7% as Malay, another 10.7% as Indian, and the remaining 3.3% identified as members of other ethnic groups. 95% of the participants were Malaysian local students and the remaining 5% were international students. The first author also approached the lecturers and tutors of the module to explain the study and get their permission to work with the first author to provide teacher feedback to the students throughout the study period.

Instrument

Students' self-regulated learning was measured using the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1993). The MSLQ is an 81-item self-report questionnaire developed based on social-cognitive and general cognitive theoretical frameworks. The MSLQ composed of Motivation and Learning Strategies major sections. The Learning Strategies section is further divided into Cognitive-Metacognitive and Resource Management sections. The Cognitive-Metacognitive, Motivation, and Resource Management sections correspond to the three aspects of Zimmerman's (1986) conceptualization of self-regulated learning: metacognition, motivation, and behavior. Respondents were to rate themselves on a 7-point Likert-type scale, from 1 (not at all true of me) to 7 (very true of me) on items such as "When studying for this course I try to determine which concepts I don't understand well (Cognitive-Metacognitive item)," "It is important for me to learn the course material in this class (Motivation item)," and "I usually study in a place where I can concentrate on my course work (Resource Management item)."

The MSLQ has demonstrated robust internal reliability as evidenced by Cronbach's alphas ranging from .52 to .93 (Pintrich, Smith, Garcia, & McKeachie, 1993). In the current study, reliability analysis revealed a robust Cronbach's alpha of .95 for the full scale. The Cronbach's alphas for the motivational, metacognitive, and behavioral subscales were .91, .91, and .67 respectively. Confirmatory factor analyses have shown that the general theoretical framework and the scales that measure them are valid. That is, the six motivational subscales and the nine learning strategies subscales characterize a coherent conceptual and empirically validated framework for assessing students' self-regulated learning. This establishes the factor validity of the MSLQ. The scale has also shown promising predictive validity. Students' scores on the scale have been shown to predict students' actual academic performance (Pintrich, Smith, Garcia, & McKeachie, 1993). Other researchers such as Bell (2006) and Bembenuatty (2007) have also found impressive relationships between the scores on the MSLQ and students' academic achievement. A more recent meta-analytic review using 2, 158 correlations from 67 independent samples by Crede and Phillips (2011) has shown that the MSLQ has a reasonably reliable measure of constructs and some of these constructs are meaningfully associated with university academic performance. Furthermore, some of these strengths of associations are similar to those observed for traditional predictors of academic performance such as scores on admission tests and prior academic performance.

Teacher Feedback Intervention

The teacher feedback intervention was implemented on two components of the course, namely lecture and assignment.

Teacher Feedback Intervention – Lecture

At the beginning of Week 2 Lecture, Feedback Request Form A1 (refer to Appendix A) was given to participants in the solicited feedback condition. The participants in the solicited feedback condition were told to think about three requests for teacher feedback as they were listening to the lecture. The participants were also requested to submit their Feedback Request Form A1 to the course lecturer, tutor, or researcher at the end of the lecture period. Upon receiving Feedback Request Form A1, the first author worked with the course lecturer or tutor to prepare the feedback requested by participants in the solicited feedback condition.

Three days after the lecture, the participants in the solicited feedback condition were given Teacher Feedback A1 (refer to Appendix B) – teacher feedback on their Week 1 Lecture based on their three requests for feedback. The participants in the unsolicited feedback condition were also given Teacher Feedback A1 – teacher feedback on their Week 1 Lecture based on three most commonly made requests for feedback by the participants in the solicited feedback condition. The participants in both conditions were told to attend to the given teacher feedback and address them as they were completing other continuous assessments and preparing for the final exam of the course.

The procedure was repeated for Weeks 3, 4, 5, and 7 Lecture. The Feedback Request Form A1 was replaced by Feedback Request Form A2, Feedback Request Form A3, Feedback Request Form A4, and Feedback Request Form A5 for Week 3 Lecture, Week 4 Lecture, Week 5 Lecture, and Week 7 Lecture respectively. The Teacher Feedback A1 was replaced by Teacher Feedback A2, Teacher Feedback A3, Teacher Feedback A4, and Teacher Feedback A5 for Week 3 Lecture, Week 4 Lecture, Week 5 Lecture, and Week 7 Lecture respectively. The intervention was not implemented in Week 6 as the regular lecture was canceled for that week. The only change between the forms was the lecture week (i.e., Week 3 Lecture, Week 4 Lecture, Week 5 Lecture, and Week 7 Lecture as opposed Week 1 in Feedback Request Form A1 and Teacher Feedback A1).

Teacher Feedback Intervention – Assignment

Four weeks prior to participants' written assignment due date, all participants were reminded of the upcoming written assignment due date and the goals of the assessment. In addition, Feedback Request Form B1 (refer to Appendix C) was given to participants in the solicited feedback condition. The participants in the solicited feedback condition were told to think about three requests for teacher feedback as they were working on the written assignment. The participants were also requested to submit their Feedback Request Form B1 to the course lecturer, tutor, or researcher during the course lecture time two weeks before the written assignment due date. Upon receiving Feedback Request Form B1, the first author worked with the course lecturers and tutors to prepare the feedback requested by participants in the solicited feedback condition.

Ten days before the written assignment due date, participants in the solicited feedback condition were given Teacher Feedback B1 – first solicited teacher feedback on their written assignment based on their three requests for feedback (refer to Appendix D). The participants in the unsolicited feedback condition were also given Teacher Feedback B1 – first unsolicited teacher feedback on their written assignment based on three most commonly made requests for feedback by the participants in the solicited feedback condition. Participants in both conditions were told to attend to the given teacher feedback and address them as they continued working on the written assignment. At the same time, participants in the solicited feedback condition

were told to think about three requests for teacher feedback as they continued working on the written assignment. The participants in the solicited feedback condition were also requested to submit their Feedback Request Form B2 to the course lecturer, tutor, or researcher during the course lecture time one week before the written assignment due date. Upon receiving Feedback Request Form B2, the first author worked with the course lecturers and tutors to prepare the feedback requested by participants in the solicited feedback condition.

Three days before the written assignment due date, participants in the solicited feedback condition were given Teacher Feedback B2 – second solicited teacher feedback on their written assignment based on their three requests for feedback. The participants in the unsolicited feedback condition were also given Teacher Feedback B2 – second unsolicited teacher feedback on their written assignment based on three most commonly made requests for feedback by the participants in the solicited feedback condition. Participants in both conditions were told to attend to the given teacher feedback and address them as they continued working and finalizing their written assignment. Three days before the written assignment due date, participants in the solicited feedback condition were also told to think about three requests for teacher feedback as they continued working and finalizing their written assignment. These participants were told to fill in Feedback Request Form B3 and attach it to their final version of the written assignment that was submitted to the course lecturer or tutor. After the written assignment due date, the Feedback Request Form B3 was detached from the assignment and the first author worked with the course lecturers and tutors again to prepare the feedback requested by participants in the solicited feedback condition.

The participants in the solicited feedback condition were given Teacher Feedback B3 – third solicited teacher feedback on their written assignment based on their three requests for feedback a week after the written assignment due date, prior to the release of the written assignment grades. The participants in the unsolicited feedback condition were also given Teacher Feedback B3 – third unsolicited teacher feedback on their written assignment based on three most commonly made requests for feedback by the participants in the solicited feedback condition. The participants in both conditions were told to attend to the given teacher feedback and address them as they were completing other continuous assessments and preparing for the final exam of the course. The only change between the forms was the primary instruction (i.e., “Think about the specific challenges you are facing as you are writing the course assignment” in Feedback Request Form B1, “Think about the specific challenges you are facing as you continue writing the course assignment” in Feedback Request Form B2, and “Think about the specific challenges you were facing as you were writing and finalizing the course assignment” in Feedback Request Form B3).

Procedure

Upon obtaining informed consent, participants were assigned to either solicited feedback condition or unsolicited feedback condition. Participants were first required to fill in the MSLQ. Next, the participants were requested to provide some demographic information such as age, gender, and ethnicity. Participants then went through Teacher Feedback Intervention – Lecture and Teacher Feedback Intervention – Assignment that were described above. The two different interventions ran concurrently. Upon the end of the interventions, all participants were required to fill in the MSLQ again. Finally, participants were requested to state and provide details on any self-regulated learning materials they came across during the duration of the study (however, none of the participants reported coming across any relevant materials). The study was conducted for the course of the semester, which was eight weeks.

Results

Assumptions Testing – Multivariate Analysis of Covariance (MANCOVA)

MANCOVA was ran to test the research questions of the study with type of feedback as the independent variable; motivational, metacognitive, behavioral components of self-regulated learning as the dependent variables, and pre-manipulation level of self-regulated learning as the covariate. Primary assumptions of MANCOVA including linearity, normality, homogeneity of variance, homogeneity of regression slopes, independence of the covariate and treatment effect, and correlation between the covariate and the dependent variable, homogeneity of covariance matrices, and absence of multicollinearity were checked, and it was found that there was no major violation of assumptions.

Findings

The means, standard deviations, skewness, and kurtosis of motivational, metacognitive, and behavioral components of students' self-regulated learning across the solicited and unsolicited feedback conditions are presented in Table 1.

Table 1: Means, Standard Deviations, Skewness, And Kurtosis of Motivational, Metacognitive, And Behavioral Components of Students' Self-Regulated Learning Across Solicited and Unsolicited Feedback Conditions

Condition	Component	<i>M</i>	<i>M_{adj}</i>	<i>S_D</i>	Skewness	<i>SE</i> Skewness	Kurto sis	<i>SE</i> Kurtosis
Solicited	Motivational	4.88	4.87	.69	-.28	.31	.45	.62
	Metacognitive	4.77	4.76	.62	-.08	.31	-.51	.62
	Behavioral	4.70	4.69	.55	.57	.31	.16	.62
Unsolicited	Motivational	4.87	4.88	.72	.03	.30	2.48	.60
	Metacognitive	4.47	4.49	.77	.59	.30	1.21	.60
	Behavioral	4.43	4.44	.59	.36	.30	.88	.60

Using Pillai's trace, there was a significant difference in the motivational, metacognitive, behavioral components of self-regulated learning between students who are given solicited teacher feedback and students who are given unsolicited teacher feedback, after controlling for pre-manipulation level of self-regulated learning, $F(3, 116) = 3.72, p = .01$, partial $\eta^2 = .08$. Separate univariate Analysis of Variance (ANOVA) revealed that there was a significant difference in the metacognitive, $F(1, 118) = 4.90, p = .03$, partial $\eta^2 = .04$ and behavioral, $F(1, 118) = 6.55, p = .01$, partial $\eta^2 = .05$, but not motivational component of students' self-regulated learning, $F(1, 118) = .02, p = .89$, partial $\eta^2 = .00$.

Specifically, the LSD *post hoc* test revealed that participants in the solicited teacher feedback condition reported greater metacognitive component of self-regulated learning than participants in the unsolicited teacher feedback condition, $p = .03$. Similarly, participants in the solicited teacher feedback condition reported greater behavioral component of self-regulated learning than participants in the unsolicited teacher feedback condition, $p = .01$.

Discussion and Conclusion

Discussion

The results of the current study revealed that there was a significant difference in the metacognitive and behavioral components, but not the motivational component of self-regulated learning between students who are given solicited teacher feedback and students who are given unsolicited teacher feedback, after controlling for pre-manipulation level of self-regulated learning. The effect sizes of .04 (metacognitive) and .05 (behavioral) fall under the category of small effect and medium effect respectively (Cohen, 1988); and zone of desired effect in the educational context (Hattie, 2009). These suggest that the effect of type of feedback on metacognitive and behavioral components of self-regulated learning is nonnegligible. These findings are mostly consistent with the series of research by Schunk and Swartz (1993) that established that students' self-regulated learning can be enhanced through social guidance and feedback.

Students who received solicited teacher feedback might have reported a greater level of self-regulated learning than students who received unsolicited teacher feedback possibly because the solicited feedback has encouraged the former group of students to better monitor their work and seek appropriate feedback from their teachers. This proposition is in line by Butler and Winne's (1995) theorization that external feedback such as teacher feedback on students' domain understandings aids the students in generating monitoring information, especially about cues that students can use to regulate their learning. Solicited teacher feedback might have also helped students who received such feedback more in determining the accuracy of self-monitoring, which in turn, enhanced their level of self-regulated learning (Schunk, 2000; Zimmerman, Bonner, & Kovach, 1996). In addition, solicited teacher feedback might have boosted students' self-regulated learning more than unsolicited teacher feedback by providing evaluative information to aid the self-judgmental subfunction of self-regulation (Bandura, 1986).

The current study suggests that solicited teacher feedback (versus unsolicited teacher feedback) affect metacognitive and behavioral components, but not the motivational component of self-regulated learning. Students having to cognitively monitor their learning process to fill in the Feedback Request Forms in the current study might have enhanced their metacognitive component of self-regulated learning. Similarly, having to manage their learning resources to fill in the forms and attend to the given teacher feedback might have enhanced the students' behavioral component of self-regulated learning. On the other hand, as students engaged in the teacher feedback process as a part of the research study and for extra credit, their motivational component of self-regulated learning might not be as affected by the intervention.

Implication

The discussed findings have theoretical, methodological as well as practical implications for the research and practice of students' self-regulated learning. The current research has played a non-trivial role in expanding knowledge on the role of teacher feedback in facilitating

students' self-regulated learning. Specifically, the research has helped in addressing the gap in the literature on the effect of type of feedback (solicited feedback and unsolicited feedback) on students' self-regulated learning. The findings have enlightened us that teachers tailoring their feedback to the specific challenges faced by students during their academic tasks enhance students' self-regulated learning more than providing traditional unsolicited teacher feedback. The findings also further educate us on the importance of utilizing student-centered learning as the significant pedagogy in contemporary educational institutions.

The current study findings also elaborate the self-regulatory mechanisms of Bandura's (1986) social cognitive theory, particularly on the links between feedback, self-observation, and self-judgmental processes. Crucially, the findings of the effect of type of feedback (solicited and unsolicited) on students' self-regulated learning add additional layers to Bandura's conceptions of self-regulatory mechanisms. While Bandura and his academic successors have discussed extensively on the role of feedback in promoting self-regulated learning, there has not been much discussion on whether the feedback is solicited or unsolicited. As systematic differences are found between these two types of feedback, incorporating findings of the current study further strengthens Bandura's conceptions. The findings of the current study provide further empirical support for the notion of reciprocal causality of the social cognitive theory as well. That is, evidence was shown that both environmental (e.g., teacher feedback) and behavioral events (e.g., solicitation of feedback) influence one's self-regulatory processes in a reciprocal fashion.

Furthermore, as a significant proportion of research in the area of self-regulated learning has utilized samples from North America and Europe and having employed a Malaysian sample in the study, this study has provided unique insights on the topic as systematic differences are expected in teaching and learning practices and processes between countries from different regions of the world. More locally, the findings have shed light on self-regulated learning of Malaysian undergraduates as most previous research conducted on this topic has relied on boarding school students as samples.

Methodologically, the study findings attest to the value of self-report in investigating students' self-regulated learning, consistent with McCardle and Hadwin's (2015) assertion that self-reports provide vital information for investigating self-regulated learning even when the information may not be fully accurate. This is because it is crucial to take into account the students' perceptions when it comes to studying self-regulated learning. More specifically, the MSLQ has been shown to be a reliable and valid instrument to study students' self-regulated learning, especially in the Malaysian university setting. In addition, the study findings imply that an intervention that spanned over a brief eight weeks period and that was integrated into existing teaching and learning environment is sufficient to detect some meaningful effects of teacher feedback on students' self-regulated learning. While a longer study period may inevitably provide more robust results, a brief eight weeks period could serve as a good start.

Finally, the findings of the current study offer an evidence-based effective feedback method for both pre-service and in-service teachers. As solicited teacher feedback has been shown to enhance students' self-regulated learning more than unsolicited teacher feedback, the former technique can be taught to in-service teachers as a part of their continuous professional development. This technique would then complement the teachers' existing effort in facilitating students' self-regulated learning. Pre-service teachers on the other hand, can be taught this feedback technique as a part of their teacher training. The incorporation would allow the pre-

service teachers to have another evidence-based feedback method in their teaching practices repertoire. The addition of the technique would also provide greater confidence for the teachers in promoting their students' self-regulated learning, given the empirical support for the stated method. Collectively, these teachers would assist in nurturing the students to be life-long learners by utilizing solicited teacher feedback.

Recommendations for Future Research

The inclusion of only one private university in the study has limited the generalizability of the findings to all universities in Malaysia and beyond. As there could be systematic variations between students from different universities, future researchers may investigate the current topic in other universities. Individual factors such as students' ethnicity and socioeconomic status were not fully controlled during the sampling of the current study as sampling was limited by the student demographics of the chosen university. Replicating the current study in universities with different ethnic compositions would be fruitful.

The current research focused on solicitation of feedback by the students and giving of the different forms of feedback by the teachers only. Future researchers may extend the research methodology by monitoring the students' behaviors in relation to addressing the given feedback. As self-regulated learning tends to be domain-specific, the effectiveness of type of teacher feedback (solicited and unsolicited) on students' self-regulated learning might vary according to chosen subjects. As such, future researchers could investigate the topic of interest in the context of other subjects such as science and education. Finally, as a period of eight weeks utilized in the current study might not have been optimal to fully capture the long-term changes in students' self-regulated learning, future researchers may employ longitudinal study design to capture the long-term changes.

Conclusion

The findings of the current study have enlightened us that teachers tailoring their feedback to the specific challenges faced by students during their academic tasks enhance students' self-regulated learning more than providing traditional unsolicited teacher feedback. It is hoped that the implications and recommendations for future research presented above are critically reflected and acted upon by all relevant parties including academic researchers, university teachers, and governing bodies, with the ultimate goal of enhancing students' self-regulated learning and nurturing the students to be life-long learners.

References

- Balzer, W. K., Doherty, M. E., & O'Connor, R. (1989). Effects of cognitive feedback on performance. *Psychological Bulletin*, 106(3), 410-433. doi:10.1037/0033-2909.106.3.410
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bell, P. D. (2006). Can factors related to self-regulated learning and epistemological beliefs predict learning achievement in undergraduate asynchronous web-based courses? *Perspectives in Health Information Management*, 3(7), 1-17.
- Bembenuitty, H. (2007). Self-regulation of learning and academic delay of gratification: Gender and ethnic differences among college students. *Journal of Advanced Academics*, 18(4), 586-616. doi:10.4219/jaa-2007-553

- Bembenutty, H. (2008). The teacher of teachers talks about learning to learn: An interview with Wilbert (Bill) J. McKeachie. *Teaching of Psychology*, 35(4), 363–372. doi:10.1080/00986280802390787
- Boekaerts, M., Pintrich, P. R., & Zeidner, M. (Eds.). (2000). *Handbook of self-regulation*. San Diego, CA: Academic Press.
- Butler, D. L., & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research*, 65(3), 245–281. doi:10.2307/1170684
- Caprara, G. V., Fida, R., Vecchione, M., Del Bove, G., Vecchio, G. M., Barbaranelli, C., & Bandura, A. (2008). Longitudinal analysis of the role of perceived self-efficacy for self-regulated learning in academic continuance and achievement. *Journal of Educational Psychology*, 100(3), 525–534. doi:10.1037/0022-0663.100.3.525
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.
- Crede, M., & Phillips, L. A. (2011). A meta-analytic review of the motivated strategies for learning questionnaire. *Learning and Individual Differences*, 21(4), 337–346. doi:10.1016/j.lindif.2011.03.002
- Dignath, C., & Büttner, G. (2008). Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level. *Metacognition and Learning*, 3(3), 231–264. doi:10.1007/s11409-008-9029-x
- Dunlosky, J., & Rawson, K. A. (2012). Overconfidence produces underachievement: Inaccurate self-evaluations undermine students' learning and retention. *Learning and Instruction*, 22(4), 271–280. doi:10.1016/j.learninstruc.2011.08.003
- Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses related to achievement*. London, UK: Routledge.
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81–112. doi:10.3102/003465430298487
- Helle, L., Laakkonen, E., Tuijula, T., & Vermunt, J. D. (2013). The developmental trajectory of perceived self-regulation, personal interest, and general achievement throughout high school: A longitudinal study. *British Journal of Educational Psychology*, 83(2), 252–266. doi:10.1111/bjep.12014
- Hofer, B. K., & Yu, S. L. (2003). Teaching self-regulated learning through a 'Learning to Learn' course. *Teaching of Psychology*, 30(1), 30–33. doi:10.1207/S15328023TOP3001_05
- Johansen, K. J., & Tennyson, R. D. (1983). Effect of adaptive advisement on perception in learner-controlled, computer-based instruction using a rule-learning task. *Educational Communication and Technology*, 31(4), 226–236.
- Kitsantas, A., Dabbagh, N., Hiller, S. E., & Mandell, B. (2015). Learning technologies as supportive contexts for promoting college student self-regulated learning. In T. Cleary & T. Cleary (Eds.), *Self-regulated learning interventions with at-risk youth: Enhancing adaptability, performance, and well-being* (pp. 277–294). Washington, DC: American Psychological Association. doi:10.1037/14641-013
- Llorens, A. C., Vidal-Abarca, E., & Cerdan, R. (2016). Formative feedback to transfer self-regulation of task-oriented reading strategies: Feedback to transfer self-regulation. *Journal of Computer Assisted Learning*, 32(4), 314–331. doi:10.1111/jcal.12134
- Longworth, N., & Davies, K. (1996). *Lifelong learning. New vision, new implications, new roles for people, organizations, nations and communities in the 21st century*. London, UK: Kogan Page.
- McCardle, L., & Hadwin, A. F. (2015). Using multiple, contextualized data sources to measure learners' perceptions of their self-regulated learning. *Metacognition and Learning*, 10(1), 43–75. doi:10.1007/s11409-014-9132-0

- Meyer, L. A. (1986). Strategies for correcting students' wrong responses. *The Elementary School Journal*, 87(2), 227-241. doi:10.1086/461491
- Ministry of Higher Education (2011). *The national higher education strategic plan beyond 2020*. Kuala Lumpur: Percetakan Nasional Malaysia Berhad.
- Mok, Y. F., Fan, R. M., & Pang, N. S. (2007). Developmental patterns of school students 'motivational- and cognitive-metacognitive competencies. *Educational Studies*, 33(1), 81-98. doi:10.1080/03055690600948281
- Ng, L. Y, Bakar, K. A., Roslan, S., Wong, S., & Rahman, P. Z. M. A. (2005). Self-regulated learning and its relationship with student-teacher interaction. *Pakistan Journal of Psychological Research*, 20(1-2), 41-63.
- Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, 31(2), 199-218. doi:10.1080/03075070600572090
- Ning, H. K., & Downing, K. (2015). A latent profile analysis of university students' self-regulated learning strategies. *Studies in Higher Education*, 40(7), 1328-1346. doi:10.1080/03075079.2014.880832
- Pajares, F., & Valiante, G. (2002). Students' self-efficacy in their self-regulated learning strategies: A developmental perspective. *Psychologia: An International Journal of Psychology in the Orient*, 45(4), 211-221. doi:10.2117/psysoc.2002.211
- Panadero, E., & Alonso-Tapia, J. (2014). How do students self-regulate? Review of Zimmerman's cyclical model of self-regulated learning. *Anales De Psicología*, 30(2), 450-462. doi:10.6018/analesps.30.2.167221
- Paris, S. G., & Paris, A. H. (2001). Classroom applications of research on self-regulated learning. *Educational Psychologist*, 36(2), 89-101. doi:10.1207/S15326985EP3602_4
- Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, 95(4), 667-686. doi:10.1037/0022-0663.95.4.667
- Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1993). Reliability and predictive validity of the Motivated Strategies for Learning Questionnaire (MSLQ). *Educational and Psychological Measurement*, 53(3), 801-813. doi:10.1177/0013164493053003024
- Schunk, D. H. (1996). Goal and self-evaluative influences during children's cognitive skill learning. *American Educational Research Journal*, 33(2), 359-382. doi:10.2307/1163289
- Schunk, D. H. (2000). *Learning theories: An educational perspective* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall.
- Schunk, D., & Ertmer, P. A. (2000). Self-Regulation and academic learning: Self- efficacy enhancing interventions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of Self-Regulation* (pp. 631-649). San Diego, CA: Academic Press.
- Schunk, D. H., & Swartz, C. W. (1993). Goals and progress feedback: Effects on self-efficacy and writing achievement. *Contemporary Educational Psychology*, 18(3), 337-354. doi:10.1006/ceps.1993.1024
- Steinberg, E. R. (1989). Cognition and learner control: A literature review, 1977-1988. *Journal of Computer-Based Instruction*, 16(4), 117-121.
- Stewart, D., & Ball, Chr. (1995). *Lifelong learning developing human potential. An action agenda for lifelong learning for the 21st century*. Brussels, BE: World Initiative on Lifelong Learning.

- Wood, R., Bandura, A., & Bailey, T. (1990). Mechanisms governing organizational performance in complex decision-making environments. *Organizational Behavior and Human Decision Processes*, 46(2), 181-201. doi:10.1016/0749-5978(90)90028-8
- Zimmerman, B. J. (1986). Development of self-regulated learning: Which are the key subprocesses. *Contemporary Educational Psychology*, 16(3), 307-313. doi:10.1016/0361-476X(86)90027-5
- Zimmerman, B. J., Bonner, S., & Kovach, R. (1996). *Developing self-regulated learners*. Washington, DC: American Psychological Association.
- Zimmerman, B. J., & 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), 51-59. doi:10.1037/0022-0663.82.1.51

Appendix A

Feedback Request Form A1

Instructions:

- i. Think about the specific challenges you were facing as you were **listening to Week 2 Lecture** today.
- ii. State three questions / areas on which you would like your lecturer / tutor to provide feedback / comments on. Please be as specific as you can.
- iii. Please ensure that all three sections are filled in.

Example: The difference between quantitative and qualitative data is unclear.

1. _____

2. _____

3. _____

Appendix B

Teacher Feedback A1

(To be filled in by the lecturer / tutor of the course)

1. _____

2. _____

3. _____

Appendix C

Feedback Request Form B1

Instructions:

- i. Think about the specific challenges you are facing as you are **writing the course assignment**.
- ii. State three questions / areas on which you would like your lecturer / tutor to provide feedback / comments on. Please be as specific as you can.
- iii. Please ensure that all three sections are filled in.

Example: The difference between quantitative and qualitative data is unclear.

1. _____

2. _____

3. _____

Appendix D

Teacher Feedback B1

(To be filled in by the lecturer / tutor of the course)

1. _____

2.

3.