

The Relationship between Self-regulatory Development, Language Learners' Metacognitive Awareness and L2 Reading Comprehension of Iranian Intermediate EFL Learners

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Abstract

This research studied the relationship between self-regulatory development, language learners' metacognitive awareness and L2 reading comprehension of Iranian intermediate EFL learners. The purpose of this research was to investigate whether learners were able to reliably regulate their own reading comprehension or not. Sixty participants were selected based on a simple random sampling from the 75 students by Chocran's Sample size formula. The students were asked to answer the questionnaire developed by Kanfer (1970a, and 1970b) and Schraw, & Dennison (1994). These questionnaires consisted of 63 and 52 items respectively. The reading comprehension test was run to investigate whether there was any relationship between self-regulation and reading comprehension. Pearson correlation was 0.303 in this study. Results revealed that there was strong relationship between reading comprehension and self-regulation. The findings also revealed that there was large relationship between metacognitive awareness and reading comprehension but there was not any relationship between self-regulation and metacognitive awareness. The study could have implications for English language teachers, learners and text book writers.

Keywords: self-regulation, reading comprehension, metacognitive awareness

INTRODUCTION

Reading is a complex cognitive process of decoding symbols in order to construct or derive meaning (reading comprehension). Like all language, it is a complex interaction between the text and the reader which is shaped by the reader's prior knowledge, experiences, attitude, and language community which is culturally and socially situated. The reading process requires continuous practice, development, and refinement. In

addition, reading requires creativity and critical analysis. Because reading is such a complex process, it cannot be controlled or restricted to one or two interpretations. There are no concrete laws in reading, but rather allows readers an escape to produce their own products introspectively. This promotes deep exploration of texts during interpretation. Readers use a variety of reading strategies to assist with decoding (to translate symbols into sounds or visual representations of speech) and comprehension. Readers may use context clues to identify the meaning of unknown words. Readers integrate the words they have read into their existing framework of knowledge or schema (schemata theory). Self-Regulated Strategy Development Model (SRSD) is an implementation model for cognitive strategy instruction. According to Read (2005) "The goal of SRSD is to make the use of strategies habitual, flexible, and automatic". The terms metacognition, self-regulation, and self-regulated learning appear frequently in the educational literature and are sometimes used interchangeably. In order to explore the theoretical and empirical boundaries between these three constructs and the perceptions or misperceptions that their broad and often unqualified application may engender, an analysis of their use within contemporary research was undertaken. The current research addresses the topic of self-regulation as a way to bridge the gap between written texts and students' perception of the evaluation process to foster students' autonomy and improve his/her learning. Though most teachers would agree that teaching students to be more self-regulative in the classroom would be ideal, the practice does not come without challenge. Developing lessons that prepare students to engage in SRL practices and provide real support and opportunities for implementation is no small feat (Paris, & Paris, 2001). Many will find that the major obstacle in helping students become self-regulative is the time required to teach students how to use specific strategies (Boekaerts & Cascallar, 2006). Although teachers in K-12 settings often are pressed to accomplish many tasks in limited time spans, it is important to remember that SRL strategies can help students learn new information and effectively prepare for those very tasks. Fundamental changes at the school level may need to occur for teachers to be able to allocate the time and resources necessary for preparing students to be self-regulated learners. Most importantly, classroom curriculum and accompanying assessment systems must be organized in ways that support and value autonomous inquiry and strategic problem-solving.

REVIEW OF THE RELATED LITERATURE

Zimmerman (2002) explains that self-regulated learning is not only a simple personal trait that learners either possess or lack, but it consists of the selective use of specific processes personally adapted to each learning task. He adds that self-regulated component skills are as follows: (a) setting specific proximal goals for oneself, (b) adopting powerful strategies for attaining the goals, (c) monitoring one's performance selectively for signs of progress, (d) restructuring one's physical and social context to make it compatible with one's goals, (e) managing one's time use efficiently, (f) self-evaluating one's methods, (g) attributing causation to results, and (h) adapting future methods. Baumeister and Vohs (2008) state that self-regulation refers to a person's ability to change his/her behavior. The quality and existence of these actions would

alter in relation to some goals, ideals and norms no matter whether their stem would have public or internal anticipation. In general, human behavior flexibility and adaptability will increase during self-regulation process. This flexibility enables learners to regulate their performance to a broad range of situational or public requirements they encounter in their daily life experience.

Research Questions and Hypothesis

Considering the purpose of this study and in an attempt to trigger more research in the field of L2 reading in Iran, the research question for this study has been formulated as follows:

- Does SRSD improve reading comprehension of Iranian EFL learners?
- To what extent can the application of SRSD enhance the intermediate Iranian EFL learners' metacognitive awareness and reading skill?

Based on the research questions mentioned above the following research hypotheses will be investigated in the current study:

- There is no relationship between SRSD and improvement of reading comprehension.
- The application of SRSD does not enhance the intermediate Iranian EFL Learners' metacognitive awareness and reading skill.

METHOD

Participants

The students who took part in the study consisted of 60 (8 males and 52 females), 18-30 year-old EFL learners at Omid language institution in shahrekord, Iran. Selection of the participants for the study was based on a simple random sampling from the 75 students by Chocran's sample size formula. So the sample size is 60 students.

Instruments

Three instruments were used in this study. First, Metacognitive Awareness Inventory (MAI) Questionnaire by Schraw, & Dennison, (1994) that assesses metacognitive awareness. This questionnaire contains 52 items. All 52 items were answered on a 2-point Likert scale with the true and false choices. Participants who had scores higher than 30 were considered to have metacognitive awareness. In the present study, the obtained Cronbach's alpha is (0.85).

Second, the Self-Regulation Questionnaire (SRQ), Self-regulation is the ability to develop, implement, and flexibly maintains planned behavior in order to achieve one's goals. Building on the foundational work of Kanfer (1970a, and 1970b), Miller and Brown formulated a seven-step model of self-regulation (Brown, 1998) (Miller & Brown, 1994). In the present study, the obtained Cronbach's alpha is (0.92).

In this study because the participants were intermediate EFL learners, the researcher used the translation of Metacognitive Awareness Inventory (MAI) questionnaire, and also translation of The Self-Regulation Questionnaire (SRQ) to comprehend the questionnaires. All 63 items are answered on a 5-point Likert scale with the following scale points: 1 Strongly disagree, 2 Disagree, 3 Uncertain or Unsure, 4 Agree, and 5 Strongly Agree.

Third, reading comprehension test of EFL language learners (Craig Benjamin, "The Machu Picchu Model: Climate Change and Agricultural Diversity." 1999.). This is a standardized multiple-choice reading comprehension test. The administration time was about 60 minutes.

Procedure

In this study the EFL learners Comprehension test was taken by the researcher. All students answered the reading test in one session spending 55 minutes for the test. In the second phase, Metacognitive Awareness Inventory (MAI) questionnaire was carried out lasting 60 minutes. And then the Self-regulation Questionnaire (SRQ) was responded by students.

This research was divided into three phases. The first phase was comprehension test, the second phase was Metacognitive Awareness Inventory (MAI) questionnaire, and the third phase was Self-Regulation Questionnaire (SRQ).

Data analysis

This study is quantitative. The data gathered through reading test was analyzed by using the *Statistical Package for the Social Sciences* (SPSS) for Windows version 20.0. Descriptive statistical procedures and analysis of Pearson correlation coefficient, variance (ANOVA) were used to ascertain the extent to which self-regulation and metacognitive strategy instruction influenced the learners' reading comprehension.

RESULTS

Research Questions

1. Does SRSD improve reading comprehension of Iranian EFL learners?

The mean of SRSD was 2.96 and SD was 0.42. So we compare these scales by One-Sample T-test. Result Showed that mean of Self-Regulation Strategy Development score was more than 2.5 (standardize mean) and the difference was significant ($p < 0/05$). We stated that SRSD instruction improve reading comprehension of Iranian EFL learners. In this regard, Self-regulated learning is a process that assists students in managing their thoughts, behaviors, and emotions in order to successfully navigate their learning experiences. Self-regulation is essential to the learning process (Zimmerman, 2002). It can help students create better learning habits and strengthen their study skills (Wolters, 1999), apply learning strategies to enhance academic outcomes (Harris, and

Graham, 1996), monitor their performance (Harris, 1986), and evaluate their academic progress.

Table 1: One-Sample Statistics

	Number	Mean	Std. Deviation
Sum of SRSD	60	2.96	.42

Table 2: One-Sample Test

Test Value = 2.5						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Sum of SRSD	8.52	59	0.001	0.46	0.35	0.57

(t=8.52 & p=0.001)

2. To what extent can the application of SRSD enhance the intermediate Iranian EFL learners' metacognitive awareness and reading skill?

One-Sample Statistics Showed that mean of metacognitive awareness and reading skill was 37.18 that was upper than standardize mean. One-Sample Statistics Showed that mean of metacognitive awareness marks more than 30 (standard mean) and the difference was significant. ($p < 0/05$). It is explained that self-regulated learners are able to set short- and long-term goals for their learning, plan ahead to accomplish their goals, self-motivate themselves, and focus their attention on their goals and progress. They also are able to employ multiple learning strategies and adjust those strategies as needed, self-monitor their progress, seek help from others as needed, and self-evaluate their learning goals and progress based upon their learning outcomes. Teachers at the primary and secondary levels can use the aforementioned strategies to promote self-regulation in their classrooms. However, teachers should understand that learners develop at various paces, and strategies that work best for one learner may not always work with the next. Research has found self-efficacy and the use of self-regulation strategies to have reflexive positive impacts on one another. Higher self-efficacy beliefs increase the use of self-regulation strategies (Pajares, 2000). The use of self-regulation strategies can lead to increases in self-efficacy beliefs and academic achievement (Schunk, 2001; Zimmerman, 2000). When students are motivated to learn, they are more likely to invest the necessary time and energy needed to learn and apply appropriate SRL skills, and when students are able to successfully employ self-regulation strategies, they are often more motivated to complete learning tasks (Zimmerman, 2000). In the present study we find this result.

Table 3: One-Sample Statistics

	Number	Mean	Std. Deviation
Sum of MAI	60	37.18	8.16

Table 4: One-Sample Test

	Test Value = 30					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Sum of MAI (t=6.81 & p=0.000)	6.81	59	.000	7.18	5.07	9.29

Research Hypotheses

1. There is no relationship between SRSD instruction and improvement of reading comprehension.

In this Study the Pearson Correlation test with ($r=0.303$ & $p=0.019$) shows that there is positive significant relationship between SRSD instruction and improvement of reading comprehension ($P<0.05$). So we accepted the opposite Hypothesis. In this regard the research showed that self-regulated students are more engaged in their learning and voluntarily offer answers to questions and also perform higher on measures of academic achievement. It seems as though SRL can make the difference between academic success and failure for many students.

Pintrich (2000) defines self-regulation (or self-regulated learning) as “an active, constructive process whereby learners set goals for their learning and then attempted to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment”. Since 1985, more than 30 studies have been conducted using SRSD, primarily in the area of writing, with students from elementary through high school (Harris, Graham, 1996). While SRSD encompasses teaching multiple skills and strategies, it also incorporates current beliefs regarding expertise in subject matter domains (Alexander, 1997). The results of this study are consistent with present study.

Table 5: Correlations

		Sum of COMPR	Sum of SRQ
Sum of COMPR	Pearson Correlation	1	.303*
	Sig. (2-tailed)		.019
	N	60	60
Sum of SRQ	Pearson Correlation	.303*	1
	Sig. (2-tailed)	.019	
	N	60	60

2. The application of SRSD does not enhance the intermediate Iranian EFL Learners' metacognitive awareness and reading skill.

The Pearson Correlation test with ($r=0.157$ & $p=0.231$) shows that there is no significant relationship between SRSD and metacognitive awareness in the intermediate Iranian EFL Learners' but there is a significant relationship between SRSD and reading

skill. ($r = 0.303$ & $p = 0.019$). Or ($p < 0.05$). So we accepted the opposite Hypothesis. In this regard it is explained that the application of SRSD does not enhance metacognitive awareness in Iranian EFL Learners, but it can enhance reading skill. About relationship between SRSD and metacognitive awareness, Baumeister and Vohs (2008) state that self-regulation refers to a person's ability to change his/her behavior. The quality and existence of these actions would alter in relation to some goals, ideals and norms no matter whether their stem would have public or internal anticipation. In general, human behavior flexibility and adaptability will be increased during self-regulation process. This flexibility enables learners to regulate their performance to a broad range of situational or public requirements they encounter in their daily life experience. But in this study we have not obtained this result perhaps the sample size is one reason.

About the relationship between SRSD and reading skill Zimmerman (2002) explains that self-regulated learning is not only a simple personal trait that learners either possess or lack, but it consists of the selective use of specific processes personally adapted to each learning task. He defines self-regulated learning strategies as "actions and processes directed at acquisition of information or skills that involve agency, purpose, and instrumentality perceptions by learners. Our result is in agreement with Zimmerman.

Table 6: Correlations

		Sum of MAI	Sum of COMPR	Sum of SRSD
Sum of MAI	Pearson Correlation	1	.371**	.157
	Sig. (2-tailed)		.004	.231
	N	60	60	60
Sum of COMPR	Pearson Correlation	.371**	1	.303*
	Sig. (2-tailed)	.004		.019
	N	60	60	60
Sum of SRSD	Pearson Correlation	.157	.303*	1
	Sig. (2-tailed)	.231	.019	
	N	60	60	60

Other findings

1-There is no relationship between metacognitive awareness and improvement of reading comprehension.

The Correlation shows that there is a positive significant relationship between metacognitive awareness and improvement of reading comprehension. ($r = 0.37$ & $p = 0.004$). Or ($p < 0.05$). In this regard studies demonstrate that successful comprehension does not occur automatically. Rather, it depends on directed cognitive effort, referred to as metacognitive processing, which consists of knowledge about regulation of cognitive processing. During reading, metacognitive processing is expressed through strategies, which are "procedural, purposeful, effortful, willful, essential, and facilitative in nature" (Alexander & Jetton 2000: 295). Also Pressley (Pressley, & Afflerbach, 1995) explained that through metacognitive strategies, a reader

allocates significant attention to controlling, monitoring, and evaluating the reading process.

Table 7: Correlations

Correlations			
		Sum of MAI	Sum of COMPR
Sum of MAI	Pearson Correlation	1	.371**
	Sig. (2-tailed)		.004
	N	60	60
Sum of COMPR	Pearson Correlation	.371**	1
	Sig. (2-tailed)	.004	
	N	60	60

2- There is a significant difference between SRSD, metacognitive awareness and improvement of reading comprehension with participants' genders.

Independent Samples Test shows that there is a significant difference between improvement of reading comprehension with participant's genders ($p < 0/05$), but no difference between SRSD and metacognitive awareness with participant's genders ($p > 0/05$).

Table 8: Group Statistics

	Gender	Number	Mean	Std. Deviation
Sum of SRDS	Male	8	36.00	9.19
	Female	52	37.36	8.08
Sum of MAI	Male	8	193.87	24.05
	Female	52	188.61	30.18
Sum of COMPR	Male	8	2.25	1.16
	Female	52	1.50	.75

Table 9: Independent Samples Test

	t-test for Equality of Means			
	t	df	Sig. (2-tailed)	Mean Difference
Sum of SRDS	-.437	58	.664	1.36
				1.36
Sum of MAI	.469	58	.641	5.25
				5.25
Sum of COMPR	2.424	58	.018	.75
				.75

3- There is a significant difference between SRSD, metacognitive awareness and improvement of reading comprehension with participants' ages.

One-way ANOVA showed that there was a significant difference between metacognitive awareness with participants' ages ($p > 0/05$), but no difference between SRSD and improvement of reading comprehension with participant's ages ($p > 0/05$).

Table 10: ANOVA Test

		Sum of Squares	df	Mean Square	F	Sig.
Sum of SRDS	Between Groups	471.346	7	67.335	1.443	.241
	Within groups	979.689	21	46.652		
	Total	1451.034	28			
Sum of MAI	Between Groups	14422.735	7	2060.391	2.635	.040
	Within Groups	16423.472	21	782.070		
	Total	30846.207	28			
Sum of COMPR	Between Groups	5.479	7	.783	1.422	.249
	Within Groups	11.556	21	.550		
	Total	17.034	28			

DISCUSSION AND CONCLUSION

The present study made an attempt to investigate the relationship between self-regulation development on language learners' metacognitive awareness and its possible impact on the Reading comprehension of intermediate Iranian EFL learners.

In this study sixty Iranian EFL language learners (13.3% male, and 86.7% Female) completed three instruments Metacognitive Awareness Inventory (MAI), the Self-Regulation Questionnaire (SRQ) and reading comprehension. The participants ages were not equal .15% Lower than 20, 68.3% between 20-25 and 16.7% Higher than 25 years old average of their age were 23.7 years old.

Metacognitive Awareness Frequency in the participants scored in 3 level. Low level was not observed. Moderate was 45% and high level 55%. The Self-Regulation score was (78.3% high, 18.3% moderate and 3.3% low).

The results of the research revealed that there was considerable relationship between reading comprehension and self-regulation. The findings also revealed that there was considerable relationship between metacognitive awareness and reading comprehension but there was not any relationship between self-regulation and metacognitive awareness. The study could have implications for English language teachers, learners and text book writers.

Many studies have been conducted to determine the relationship between how one regulates himself and his success in academic studies. The main concern of this research was to study if such a relationship could be detected among intermediate Iranian EFL learners' achievements. Concerning the first question, One-Sample T test was run. Tables 4.5 and 4.6 show the results. The findings show that SRSD instruction improves reading comprehension of Iranian EFL learners ($p < 0.05$). This is consistent with findings of Zimmerman (2002), and Wolters (1999). Concerning the second question, one sample T test was run. Tables 4.7 and 4.8 show the results. The findings show that application of SRSD can enhance the intermediate Iranian EFL learners' metacognitive awareness and reading skill. ($p < 0.05$). It is consistent with findings of Pajares (2008), and Zimmerman (2000) Researches.

With regard to first hypothesis, Pearson Correlation ($p < 0.05$) Show that there is positive significant relationship between SRSD instruction and improvement of reading comprehension. So we accept the hypothesis. Table 4.9 shows this result. So this is consistent with Pintrich (2000), Wong, Harris, Graham & Butler (2003) and Alexander (1997) results.

With regard to the second hypothesis the Pearson Correlation ($p > 0.05$) Show that there is no significant relationship between SRSD and metacognitive awareness in the intermediate Iranian EFL Learners', but there is significant relationship between SRSD and reading skill ($p < 0.05$). So we accept the hypothesis. Table 4.10 shows this result. This result confirms Zimmerman (2002) investigations. Also during this study we concluded that there is positive significant relationship between metacognitive awareness and improvement of reading ($p < 0.05$). It is consistent with Alexander and Jetton (2000), Pressley and Afflerbach (1995) researches.

In this study independent Samples test Show there is significant difference between improvement of reading comprehension with participants genders ($p < 0.05$), but no significant difference between SRSD & metacognitive awareness with participants genders ($p > 0.05$). One-way ANOVA Shows that there is significant difference between metacognitive awareness with participant's ages ($p < 0.05$), but no significant different between SRSD & improvement of reading comprehension with participant's ages ($p > 0.05$).

IMPLICATIONS

The findings of the present study concerning the relationship between the self-regulation and reading comprehension have important pedagogical implications which might prove useful to educationalists and language instructors.

The findings of the study suggest that tasks such as self-regulation by the students themselves can improve the reading comprehension of learners and can be useful for the English classes. The positive relationship between self-regulation and reading comprehension draws our attention to the importance of these variables and the role that they play in learning a foreign language.

This finding has important consequences for language teachers and educators. The educationalists and language instructors should be aware of these effects and use them appropriately in their classrooms.

In order to facilitate self-regulation in L2 classrooms, teachers should prepare learners carefully to the work. Before assigning learners to self-evaluate themselves, teachers should inform the participants about the procedure, so individuals take the responsibility of their work and pay more attention to their own work and negotiate the mistakes that may be unnoticed in correction.

SUGGESTIONS FOR FURTHER RESEARCH

As this research progressed other areas that might be worthy of investigation, but were beyond the scope of this study began to emerge. These questions can be as the following:

- What is the students' perception about the self-regulation process?
- What is the role of the teacher designing and implementing self-regulation?
- Do teachers benefit from assigning self-regulation process in the classroom or not?
- Is there any relationship between self-regulation and writing skills?

The present study investigated the relationship of the self-regulation and reading comprehension of EFL learners. The relationship of self-regulation and reading comprehension needs further empirical research.

As it was mentioned before, longer study and implementation period can provide much more data for analysis of students' perception of self-regulation. It should be pointed out that in studies like the present, many various factors may affect the results. For example, students' family background, socio-economic status, and their learning strategies, their willingness might play a role and have an impact on their level of achievements. Thus, obtaining more information about participants' background and external factors may be useful in yielding more accurate and reliable results.

REFERENCES

- Alexander, P. A. (1997). Mapping the multidimensional nature of domain learning: The interplay of cognitive, motivational, and strategic forces. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 10, pp. 213–250). Greenwich, CT: JAI Press.
- Alexander, P.A., & Jetton, T.L. (2003). Learning from traditional and alternative texts: New conceptualization for an information age. In A.C. Graesser, M.A. Gernsbacher, & S.R. Goldman (Eds.), *Handbook of discourse processes* (pp. 199–241). Mahwah, NJ: Erlbaum.
- Baumeister, R. F., & Vohs, K. D. (2008). *Handbook of self-regulation: Research, theory, and applications*. New York: Guilford.
- Boekaerts, M., & Cascallar, E. (2006). How far have we moved toward the integration of theory and practice in self-regulation? *Educational Psychology Review*, 18, 199–210.
- Bouffard-Bouchard, T., Parent, S., & Larivée, S. (1991). Influence of self-efficacy on self-regulation and performance among junior and senior high-school aged students. *International Journal of Behavioral Development*, 14, 153-164.
- Guthrie, J. T., WigWeld, A., Metsala, J. L., & Cox, K. E. (1999). Motivational and cognitive predictors of text comprehension and reading amount. *Scientific Studies of Reading*, 3, 231–256.

- Harris, K. R. (1986). The effects of cognitive-behavior modification on private speech and task performance during problem solving among learning-disabled and normally achieving children. *Journal of Abnormal Child Psychology*, 14, 63-76.
- Harris, K. R., & Graham, S. (1996). Making the reading process work: Strategies for reading and self-regulation (2nd Ed.). Cambridge, MA: Brookline Books.
- Kanfer, F. H. (1970a). Self-monitoring: Methodological limitations and clinical applications. *Journal of Consulting and Clinical Psychology*, 35, 148-152.
- Kanfer, F. H. (1970b). Self-regulation: Research, issues, and speculation. In C. Neuringer & J. L. Michael (Eds.), *Behavior modification in clinical psychology*, 178-220. New York: Appleton-Century-Crofts.
- Labuhn, A.S., Zimmerman, B.J., & Hasselhorn, M. (2010). Enhancing students' self-regulation and mathematics performance: The influence of feedback and self-evaluative standards Metacognition and Learning, 5 (2), 173-194.
- Moshman (1982), Exogenous, endogenous, and dialectical constructivism. *Developmental Review*, 371-384.
- Pajares, F. (2000). Self-efficacy beliefs and current directions in self-efficacy research. Retrieved June 6, 2013, <http://www.emory.edu/EDUCATION/mfp/effpage.html>
- Pajares, F. (2003). Self-efficacy beliefs, motivation, and achievement: A review of the literature. *Reading & Writing Quarterly*, 19 (2), 139-158.
- Paris, S. G., & Paris, A. H. (2001). Classroom applications of research on self-regulated learning. *Educational Psychologist*, 36, 89-101.
- Pressley, M., & Afflerbach, P. (1995). Verbal protocols of reading: The nature of constructively responsive reading. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Read, (2005). *Cognitive strategy instruction*. UNL, University of Nebraska.
- Schunk, D. H., & Zimmerman, B. J. (2007). Motivation and self-regulated learning: Theory, research, and applications. Mahwah, NJ: Lawrence Erlbaum.
- Wolters, C. A. (1999). The relation between high school students' motivational regulation and their use of learning strategies, eVort, and classroom performance. *Learning and Individual Differences*, 11, 281-295.
- Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist*, 25 (1), 3-17.
- Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeider (Eds.), *Handbook of self-regulation*, 13-39. San Diego, CA: Academic Press.
- Zimmerman, B. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American Educational Research Journal*, 45(1), 166-183.