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Effect of Science Learning Coach on Student Self-Regulation Skills

Numerico Lloyd B. Fabrigar

ABSTRACT

To improve students' self-regulation skills toward accomplishing science-related tasks and workloads, this study was designed to determine the effect of a science learning coach as an intervention program on student self-regulation skills. This quasi-experimental study determined the mean pre-test and post-test performance of Grade 10 students under the Special Science Curriculum. This research used a non-random purposive sampling procedure to select the respondents. The experimental group participated in the intervention program throughout the 3rd Quarter of SY 2023–2024, per the Department of Education calendar. The research instrument used in this study was a 35-item test questionnaire aimed at measuring the self-regulation skills of the respondents. The data were analyzed using Statistical Package for Social Science (SPSS) using t-test for independent samples to compare the pre-test and post-test mean scores before and after the implementation of the intervention program, respectively, and using paired samples t-test to determine the difference between the pre-test and post-test mean scores of the experimental group. Also, an analysis of covariance was used to determine and evaluate whether the means of the dependent variable are equal across levels of a categorical independent variable. This research study revealed a significant difference in terms of pre-test and post-test mean scores before and after the implementation of the intervention program using t-test for independent samples. This also showed no significant difference in the experimental group's pre-test and post-test mean scores using a t-test for paired samples. However, using pre-test mean scores as covariates, it was revealed that there is a significant difference in the post-test results of tests between subjects.

Keywords: *self-regulation skills, science learning coach, intervention programs*

INTRODUCTION

In today's fast-paced world, various external factors often compromise learning. Many students struggle with time management and organization, and certain groups are more vulnerable than others to these issues. However, these challenges do not just affect pupils who have been diagnosed with learning problems. These issues are widespread, and the increasing availability of technology seems to exacerbate the problem for students (Garhammer, 2002, as cited by Pellas, 2014). With these, independent learning becomes imperative.

According to Zimmerman et al. (1996, as cited by Pellas, 2014), independent learning requires managing time, an essential strategy. Additionally, it is shown that in the absence of efficient study time management, students often make learning judgments based on expediency since they lack the time to carry out self-regulation treatments. Therefore, pupils must become proficient in time management to apply study skills and autonomous learning methodologies.

Stress reduction, a stronger sense of control, and increased life and work satisfaction correlate with effective time management and allow students to finish tasks and use self-regulation techniques necessary for autonomous learning (Velencia-Vallejo et al., 2019).

Students who lack effective time management skills frequently put off and postpone finishing their assignments and other obligations, leading to procrastination. It is the act of putting off or failing to complete a task even though one considers it a high priority. Knowing what needs to be done but not wanting to do it leads to it. The skill to employ self-control strategies and regulate procrastination are prerequisites for delaying the satisfaction of instant gratification and controlling procrastination (Graziano et al, 2015). The most common situations where procrastination is used are when a person finds a task

✉: nlbfabrigar@mrc.pshs.edu.ph
Philippine Science High School – MIMAROPA Region Campus
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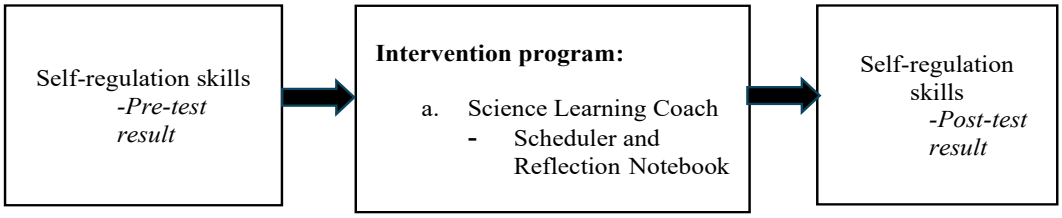

Figure 1. Conceptual framework of the study

tough or overwhelming, unpleasant, or dull. When working on reasonably challenging projects, students are significantly more likely to put off doing them than when doing ordinary homework or going to class. Students who struggle with their studies are more likely to put things off (Bembenutty, 1999; Wolters, 2003, as cited by Broadbent and Poon, 2015).

Independence to do tasks also plays a big role in the learning process. According to Bakir (2014), independence refers to the degree of control students have over their learning environment and style.

With these factors, metacognition skills are critically important to students' academic success because this has a significant impact on the acquisition, comprehension, retention, and application of what is learned (Lichtinger & Kaplan, 2015). Metacognition is defined as "cognition about cognition" or "thinking about thinking". It is an awareness and understanding of one's thought processes. Additionally, this includes the capacity to consciously reflect on and act on one's knowledge of cognition to adjust or modify one's thought processes and methods (Flavell, 1976, as cited by Blalock et al., 2015). For one learner to succeed, learning reflection and learning management are important in learning and development (Lehmann et al., 2014). Learning reflection and learning management belong to the metacognitive abilities that learners must possess. According to Chang and Chang (2015), developing metacognitive abilities is about acquiring specific learning strategies and not just simply becoming reflective learners. Independent learning requires a high level of metacognitive skills for students to succeed. Metacognitive skills allow students to be more mindful of their performance, accomplishments, reasons, and ways of gaining and developing the skills they are learning, which are essential in various situations they will face.

Figure 1 shows the conceptual framework of this study. The intervention program is perceived to be effective in improving students' self-regulation skills.

One of the goals of this study is for the students to gain independence in their studies. According to one explanation, independence refers to how much influence students exercise on the situation and approach. It is the sole element of the intricate relationship between several elements that make up the educational process (Montroy et al., 2016).

Objectives of the study

This quasi-experimental study was conducted to describe, assess, and analyze respondents' pre-test and post-test scores before and after the implementation of the intervention program.

Specifically, this study aimed to answer the following: (1) is there a significant difference between the pre-test and post-test mean scores of the two groups of respondents before and after the implementation of the intervention program?; (2) is there a significant difference between the pre-test and post-test mean scores of the experimental group before and after the implementation of the intervention program?; and (3) will the intervention program improve the self-regulation skills of the students after its implementation using mean pre-test scores as covariates?

Synthesis of the review of related literature and studies

Independence in the context of the learning process

Students' degree of control over the setting and mode of their education has been referred to as their independence (Komarraju & Nadler, 2013). It is but a small portion of the intricate interactions between several elements that make up the learning process.

According to Komarraju and Nadler (2013), one of adult education's most often mentioned goals must be to support learners' capacity to plan and carry out their education independently. Some educators have considered this to be an equally vital goal, but Short et al. (2016) suggest that it is the ability to make decisions free from outside pressure or constraints. This includes the freedom to select one's learning objectives, activities, and assessment techniques. The person is free to choose without being forced to do so because they know these options. This is the freedom to determine what, when, and where to learn, as well as the ability to analyze one's learning requirements and create one's learning objectives.

Independent Learning

Students' perception of the need for change is a prerequisite for developing independent learning skills. Students will not be incentivized to break long-standing habits or modify their approach unless they see this requirement and want to change. Studying is deliberate, not incidental. It is not under the authority of an adult; instead, it is autonomous and independent. For most students, developing independence requires instruction in both tactics and approaches. However, according to Lichtinger and Kaplan (2015), kids hardly ever acquire the self-monitoring abilities required for the best academic achievement unless they are taught tactics. Consequently, teaching self-regulation rather than only particular study techniques is now advised. (Zimmerman et al., 1986, as cited by Lichtinger and Kaplan, 2015).

According to Broadbent and Boon (2015), self-regulated students actively and independently direct their education and refresh their knowledge as needed. Developing self-regulation abilities and providing opportunities for lifelong learning should also be top priorities in school. It has been discovered that self-regulation techniques and guided instruction are more crucial than natural aptitude when people are learning chess, computer programming, sports, music, typing, and writing. (Zimmerman et al., 1996, as cited by Lichtinger and Kaplan, 2015). Similar techniques are used when academically successful students study on their own. They self-regulate their motivation, emotions, behavior, time management, mental processes, and context to optimize their learning. As they gain knowledge, they put strategies into practice, assess their effectiveness, and adjust their tactics based on their performance (Ifeanyi & Chukwuere, 2018). Self-regulatory mechanisms—specifically, organization, record keeping and monitoring, record review, and environmental management—predict academic success with 96% accuracy. (Blalock et al. 2015 quoted Zhou et al., 2001). Additionally, student characteristics interact with social and instructional aspects to create a more expansive dynamic system (Hood, 2015).

Self-regulation

Self-regulation involves at least three phases (Alvi & Gillies, 2015): preparation, performance, and appraisal. Planning, goal-setting, task description, analysis, and the choosing of a strategy based on attitudes like self-efficacy, outcome expectations, valuing, and intrinsic motivation are all components of preparation. Performance consists of goal-setting, applying strategies, monitoring and modifying strategies, self-monitoring, attentional focus, self-recording, self-experimentation, and self-control. The last stage, known as assessment, includes self-reflection, self-judgment, performance evaluation, performance feedback, and self-satisfaction. A Successful learner controls their motivation and emotions during each of the three stages of self-regulation. (Zimmerman et al., 1996, as cited by Lichtinger and Kaplan, 2015). In phase one, preparation, the learner takes ownership of their education and adopts effective goal orientations and attributions for both success and failure. In the second phase, known as the performance phase, the learner observes and practices strategies to maintain motivation and regulate emotions. During the evaluation phase, which is the third stage of the learning process, the learner evaluates their motivation and feelings from the experience and applies those insights to modify their future objectives, attitudes, and attributions.

Self-regulated learners include self-regulation techniques in their time management and behavior. During planning, individuals break down more complex assignments into smaller, more manageable tasks, set goals, and schedule their time. During the performance phase, individuals use self-observation to monitor their actions and manage their innate procrastination tendencies. During the performance evaluation stage, they take stock of their actions and apply the insights they gain to modify their conduct and self-care techniques going forward. In addition, self-regulated learners organize, track, evaluate, and manage the environmental elements that influence their learning (Graziano et al., 2015)

Self-regulated students ensure they eat healthily and have the proper vision and hearing correction for the tasks at hand. They get enough sleep since sleep deprivation impairs one's capacity to concentrate, regulate behavior, and learn. (Lehmann and Ifenthaler, 2014). During the learning sessions, students also consider any physical aspects that might have helped or hurt their performance. These strategies are influenced by the learner's context, which consists of the learning environments created in the classroom, school, and home and the social context provided by instructors, parents, and classmates (Li et al., 2016).

Social cognition is the main process that develops the capacity for self-regulation. (Bandura, 1986, as cited by Pellas, 2014). The child first understands key strategy elements by closely observing their parents, siblings, peers, and teachers exhibiting self-regulation. The youngster mimics similar tactics while being guided by someone else. so gaining the capacity to regulate motivation, feelings, thought processes, actions, and behavior in controlled environments.

Self-regulation strategy in managing distractions

Since distraction prevents the attentional selection and processing of appealing stimuli and the behavioral implications of these stimuli, it can be a very helpful self-regulation technique. (Montroy et al., 2016).

However, distraction will not help with the problem of self-control. Short et al. (2016) state that maintaining a high cognitive load once a strong desire has already been aroused may make it more difficult to resist temptation (like chocolate cake) and stick to long-term objectives (like dieting). This could be because cognitive load hinders self-control attempts (top-down) rather than the emotive reactions (bottom-up) that create temptation.

Thus, the working memory load may paradoxically impact self-regulation depending on when the distracter activity is finished. Traumatic memory intrusions can be reduced by reducing the working memory load during the consolidation of emotional memories (Broadbent & Poon, 2015). This distinguishes between two aspects of mindfulness: attention regulation, which is defined by a greater level of top-down control over attention, and attention quality, which we refer to as the mindful attention perspective.

METHODOLOGY

Research Design

The study employed a quasi-experimental group pre-test and post-test methodology, and participants were not paired off at random into two groups. Through experiments in which the intervention is not allocated randomly, quasi-experimental studies assess the relationship between an intervention and a result. Furthermore, quasi-experiments are a subset of non-studies that mimic the experimental design of genuine, randomized experiments but do not use random assignment.

Similar to the control group designs for the pre-and post-tests, implementing a science learning coach as an intervention program was introduced to the two groups of respondents. Pre-tests and post-tests were administered to both groups to assess their similarity before and after the intervention program.

Research method

A two-group, quasi-experimental pre-test and post-test design was used in this investigation. Empirical studies that establish the causal effects of an intervention on the target population are known as quasi-experimental studies. Usually, it enables the researchers to regulate the allocation to the treatment condition by employing a different criterion than random assignment. The researcher utilized the quasi-experimental research method through pre-tests and post-tests to determine the effect of the science learning coach as an intervention program to improve the students' self-regulation skills.

Research locale and time of the study

The setting of the experimental investigation at Odiongan National High School, Brgy. Dapawan, Odiongan, Romblon, Division of Romblon. Odiongan is one of the municipalities on Tablas Island, the largest among the islands of Romblon.

Population and samples of the study

The study samples were the 2 sections of Grade 10 students under the Special Science Curriculum from Odiongan National High School, with 20 students in each section.

To choose the control and experimental groups for the study, the researcher pre-tested the participants using the self-regulation abilities questionnaire.

Since the respondents to this study are minors, written parental approval was obtained before conducting the study. They received guarantees that all information and data collected will be utilized exclusively for this study and in compliance with RA 10173, often known as the Data Privacy Act of 2012.

Research Sampling Procedure

This research work used non-random purposive sampling to determine the effect of a science learning coach as an intervention program to improve students' self-regulation skills. his method was chosen because the respondents were intentionally selected based on their pre-test self-regulation skills. Forty students made up this quasi-experimental design: twenty for the experimental group and twenty for the control group. The intervention program was presented to twenty pupils in total.

Formulation of research instrument

A 35-item test that the researcher created to measure the student's abilities in self-regulation was the research tool utilized in this study. To measure the self-regulation skills of the respondents, a Likert Scale with seven (7) alternative ratings was adapted: 7 – Very True For Me, 6 – Moderately True For Me, 5 – Slightly True For Me, 4 – Neutral, 3 – Slightly Not True For Me, 2 – Moderately True For Me, 1 – Not All True For Me.

Validation and reliability of the instrument

The instrument was given to specialists for a reliability test and content validation to determine its validity and dependability. Additionally, 150 students who were not study participants participated in a pilot test of it.

Data gathering procedure

The Odiongan National High School Office of the School Principal was consulted to obtain permission to conduct the study. To gauge the students' abilities in self-regulation, the researcher gave the target respondents the pre- and post-tests, respectively, before and after the intervention program's start.

Table 1. Pre-test and post-test mean scores of the control and experimental groups

Test	Group	Mean	StD	N
Pre-test	Control	5.22	.50077	20
	Experimental	5.69	.64643	20
Post-test	Control	5.16	.55691	20
	Experimental	5.83	.72470	20

Data processing and analysis

The pre-test was given to the target groups by the researcher to identify the control and experimental groups for the study. Independent samples t-test was then administered to determine the difference between the pre-test mean scores of the 2 groups before the implementation of the intervention programs. After the study's control and experimental groups were identified, the experimental group underwent an 8-week intervention program throughout the entirety of the third quarter of the 2023–2024 academic year. The 8-week duration of the intervention program is supported by a quasi-experimental study conducted by Blancia and Fetalvero (2021), who conducted quasi-experimental research and employed an intervention for a duration of 8 weeks. Another quasi-experimental study conducted by Power et al. (2017), who tested the impact of the intervention on student achievement of the students conducted their data collection for a duration of 2 weeks. Mirhosseini et al. (2018), who tested the effectiveness of self-regulation learning skills on motivational and academic variables among students, provided the students with a self-regulation training program in 12 sessions of 1 hour, 12 hours in total, the entire duration of the intervention.

After the intervention program's implementation, the researcher gave the post-test to the two groups. An independent samples t-test was used to find the difference between the post-test mean scores following the intervention program's execution. A paired samples t-test was used to ascertain the difference between the experimental group's pre- and post-test mean scores following the execution of the intervention program. Additionally, pre-test mean scores were used as covariates, and analysis of covariance (ANCOVA) was used to assess whether the means of the dependent variable were equivalent across levels of a categorical independent variable.

FINDINGS AND DISCUSSION

Table 1 shows the descriptive statistics of the pre-test and post-test mean scores of the samples in the control and experimental groups. The pre-test and post-test have the same number of students, with a total sample of 40. The pre-test mean score of the control group is 5.22 with a standard deviation of .50077, while the experimental group is 5.69 with a standard deviation of .64643. As for the post-test, the control group's mean score is 5.16 with a standard deviation of .55691, while the experimental group is 5.83 with a standard deviation of .72470.

Table 2 shows the result of the independent samples t-test for the pre-test and post-test mean scores of control and experimental groups. Before the Analysis of Covariance, the test for homogeneity was first established using a t-test for two independent samples, which resulted in a significant value of 0.014, lower than a significant value of 0.05. This implies a significant difference between the two groups regarding pre-test mean scores, indicating different levels of self-regulation skills.

The initial result is supported by Verstege et al.'s (2019) study, which examined the relationship between students' perceived levels of self-regulation and their associated learning behaviors and outcomes in a virtual experiment environment, supports the idea that students' initial levels of self-regulation skills vary depending on what they already know. Students in the study were categorized as having high, medium, or low perceived levels of self-regulation skills. Additionally, this study demonstrated that those with limited self-regulation skills exhibited the lowest level of engagement and the highest level of optimal learning activity.

As for the post-test mean scores of the control and experimental groups, the test resulted in a significant value of 0.002, lower than a significant value of 0.05. This implies that there is a significant difference between the two groups in terms of post-test mean scores and directly describes that both groups have different levels of regulation skills after the implementation of the science learning coach as an intervention program.

Table 3 shows the result of the paired samples t-test for the pre-test and post-test mean scores of the experimental group after the implementation of the intervention program. The test resulted in a significant value of 0.350, higher than a significant value of 0.05. The test implies no significant difference in the pre-test and post-test mean scores of the experimental group

Table 4 shows the ANCOVA results of test between-subject effects in the post-test mean scores of the control and experimental groups. The results have shown a significance value of 0.042 ($F = 4.421$). The significance value of 0.042 is lower than the significance value of 0.05, implying that the experimental group's post-test mean score is significantly higher than the control group. This means that the science learning coach is effective as an intervention program to determine its effect on student self-regulation skills.

Table 2. Independent samples t-test for pre- and post-test mean scores of control and experimental groups

Test		Levene's Test for Equality for Variances		t-test for Equality of Means	
		F	Sig.	t	Sig. (2-Sided p)
Pre-test	Equal variances assumed	2.478	.124	-2.563	.014
	Equal variances not assumed			-2.563	.015
Post-test	Equal variances assumed	2.648	.112	-3.278	.002
	Equal variances not assumed			-3.278	.002

Table 3. Paired samples t-test for pre-test and post-test mean scores of the experimental group

Test	Paired - differences			
	Mean	Std. Deviation	t	Sig. (2-tailed)
Pre-test & Post-test	-.14000	.65363	-.958	0.350

Table 4. ANCOVA post-test results of tests of between-subjects using pre-test mean scores as covariates

Source	F	Sig.	Partial Eta Squared
Corrected model	13.065	< .001	.414
Intercept	7.905	.008	.176
Pre-test	12.217	.001	.248
Group	4.421	.042	.107

The result of the analysis of covariance shows that the use of science learning coaches as an intervention program influences the students' self-regulation skills. As revealed, a significance value of 0.042 implies that using a science learning coach as an intervention program effectively improves the student's self-regulation skills. It also revealed an effect size of 0.107, which means that the effect is small, with 58% of the control group below the experimental group's mean. Nevertheless, no matter how big or small the effect size, implementing a science learning coach as an intervention program affects student self-regulation skills.

This has been proven by a similar study conducted by Montroy et al. (2016), which showed that when students can manage their emotions, behaviors, and attitudes to reach an ideal level of simulation where they can learn, self-regulation skills are affected and improved. Another similar study conducted by Ejubovic and Puska (2019) showed that academic performance is affected by self-regulation skills. To support this further, the following are direct reflections of some of the respondents:

"The reasons for me to accomplish the scheduled tasks are because I wanted to finish all the pending activities and I wanted to finish it on time."

"I realized that time management is very important when you have a lot of activities to do."

"I am more productive when I have a planned out schedule."

The implications of the result o this study revealed the effect of science learning coaches on student self-regulation skills. Elementary and secondary schools need to adapt to different methods and strategies that can be employed to improve students' self-regulation skills and academic performance. In return, teachers would not have to make interventions to improve student academic performance after a rating period which can be classified as a reactive approach than a proactive approach. According to Fonteyne et al. (2014), academic achievement and students' usage of self-regulation learning practices are related. Academic performance and self-efficacy both increase when self-regulation learning skills rise. Freeman et al. (2017) also found that students can apply metacognitive skills and link these skills to academic success. Academic accomplishment is positively and significantly impacted by practicing self-regulation learning mechanisms, as demonstrated by a study conducted by Mirhosseini et al. (2018).

CONCLUSION AND RECOMMENDATIONS

This study investigated how scientific learning coaches affected students' abilities to self-regulate. In this investigation, the control and experimental groups were chosen by non-purposive random selection. The

analysis of covariance utilizing pre-test mean scores as covariates produced data that indicated the impact of the science learning coach on students' self-regulation abilities. However, the independent samples t-test for pre-test and post-test scores showed no significant change in self-regulation skills after the intervention program.

This research has certain limitations. The respondents in this study were under the Special Science Curriculum of the Department of Education, which somehow students have structured learning abilities and strategies. To validate the results, additional statistical analysis must be performed to examine the link between the variables. The study must include more respondents, along with additional criteria and questions. Aside from that, more research must be done to determine how and what the science learning coach influences and affects the students' self-regard capacity.

The curriculum should be created by curriculum designers to support students' learning autonomy. Teachers should try implementing more student-centered learning activities in the classroom and inspire students to study more autonomously by introducing them to cutting-edge ideas in self-regulated learning. Students should constantly complete extremely challenging academic assignments to increase their self-efficacy. They should also strive to generate intrinsic drive as they approach each new learning endeavor.

Given the results and discussions of the study, the researcher recommends that school administrators and policymakers use the empirical results generated from this study as evidence and a springboard in the formulation of rules and guidelines for better quality education. Also, as this study only covers one-quarter of the school year, the adequacy of the length of the intervention cannot be fully ascertained. With this, the researcher recommends a similar study with a two-quarter-long experiment or a yearlong investigation. In addition, since the researcher used the students under the Special Science Class program as respondents to the study, the students somehow have more structured learning strategies and higher self-regulation skills than others. With this, the researcher also recommends conducting a similar study with students from the Basic Education Program or other Department of Education curriculum programs.

AUTHOR'S CONTRIBUTIONS

The author confirms sole authorship of this study.

CONFLICT OF INTEREST

The author declares no conflict of interest.

REFERENCES

Alvi, E., & Gillies, R. M. (2015). Social interactions that support students' self-regulated learning: A case study of one teacher's experiences. *International Journal of Educational Research, 72*, 14–25. https://doi.org/10.1016/j.ijer.2015.04.008

Bakir, S. (2014). 5th grade students' opinions about active learning environment. *Procedia-Social and Behavioral Sciences, 116*, 3553–3558. https://doi.org/10.1016/j.sbspro.2014.01.801

Blalock, D. V., Franzese, A. T., Machell, K. A., & Strauman, T. J. (2015). Attachment style and self-regulation: How our patters in relationships reflect broader motivational styles. *Personality and Individual Differences, 87*, 90–98. https://doi.org/10.1016/j.paid. 2015.07.024

Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education, 27*, 1–13. https://doi.org/10.1016/j.iheduc.2015.04.007

Chang, C., & Chang, C. K. (2014). Developing students' listening metacognitive strategies using online videotext self-dictation-generation learning activity. *The EUROCALL Review, 22*(1), 3–19. https://doi.org/10.4995/eurocall.2014.3636

Ejubovic, A., & Puska, A. (2019). Impact of self-regulated learning on academic performance and satisfaction of students in the online environment. *Knowledge Management & E-learning, 11*(3), 345–363. https://doi.org/10.34105/j.kmel.2019.11.108

Blancia, G. V. V., & Fetalvero, E. G. (2021). Problem-based learning approach: effect on achievement in genetics among grade 12 students. *Turkish Online Journal of Qualitative Inquiry, 12*(7).

Fonteyne, L., De Fruyt, F., Dewulf, N., Duyck, W., Erauw, K., Goeminne, K., Lammertyn, J., Marchant, T., Moerkerke, B., Oosterlinck, T., & Rosseel, Y. (2014). Basic mathematics test predicts statistics achievement and overall first-year academic success. *European Journal of Psychology of Education, 30*(1), 95–118. https://doi.org/10.1007/s10212-014-0230-9

Freeman, E. E., Karayanidis, F., & Chalmers, K. A. (2017). Metacognitive monitoring of working memory performance and its relationship to academic achievement in Grade 4 children. *Learning and Individual Differences, 57*, 58–64. https://doi.org/10.1016/j.lindif.2017.06.003

Graziano, P. A., Slavec, J., Ros, R., Garb, L., Hart, K., & Garcia, A. (2015). Self-regulation assessment among preschoolers with externalizing behavior

problems. *Psychological Assessment, 27*(4), 1337–1348. https://doi.org/10.1037/pas0000113

Ifeanyi, I. P., & Chukwuere, J. E. (2018). The impact of using smartphones on the academic performance of undergraduate students. *Knowledge Management & E-Learning, 10*(3), 290–308.

Komarraju, M., & Nadler, D. (2013). Self-efficacy and academic achievement: Why do implicit beliefs, goals, and effort regulation matter?. *Learning and individual differences, 25*, 67–72. https://doi.org/10.1016/j.lindif.2013.01.005

Lehmann, T., Hähnlein, I., & Ifenthaler, D. (2014). Cognitive, metacognitive and motivational perspectives on preflection in self-regulated online learning. *Computers in Human Behavior, 32*, 313–323. https://doi.org/10.1016/j.chb.2013.07.051

Lichtinger, E., & Kaplan, A. (2015). Employing a case study approach to capture motivation and self-regulation of young students with learning disabilities in authentic educational contexts. *Metacognition and Learning, 10*(1), 119–149. https://doi.org/10.1007/s11409-014-9131-1

Li, T. M. H., Chau, M., Sung, W., Lee, A. J., Wong, P. W. C., & Yip, P. S. F. (2016). Design and evaluation of a Facebook game for self-directed e-learning. *Knowledge Management & E-Learning, 8*(3), 464–480.

Montroy, J. J., Bowles, R. P., & Skibbe, L. E. (2016). The effect of peers' self-regulation on preschooler's self-regulation and literacy growth. *Journal of Applied Developmental Psychology, 46*, 73–83. https://doi.org/10.1016/j.appdev.2016.09.001

Mirhosseini, F. S., Lavasani, M. G., & Hejazi, E. (2018). The effectiveness of self-regulation learning skills on motivational and academic variables among students. *World Family Medicine Journal, 16*(5), 68–75. https://doi.org/10.5742/mewfm.2018.93385

Pellas, N. (2014). The influence of computer self-efficacy, metacognitive self-regulation and self-esteem on student engagement in online learning programs: Evidence from the virtual world of Second Life. *Computers in Human Behavior, 35*, 157–170. https://doi.org/10.1016/j.chb.2014.02.048

Power T., McCormick R., Asbeek-Brusse E. (2017). *A Quasi-Experimental Study of the Classroom Practices of English Language Teachers and the English Language Proficiency of Students, in Primary and Secondary Schools in Bangladesh. Research Report.* EIA Research Reports; English in Action (EIA), Dhaka, Bangladesh.

Short, M. M., Mazmanian, D., Oinonen, K., & Mushquash, C. J. (2016). Executive function and self-regulation mediate dispositional mindfulness and well-being. *Personality and Individual Differences, 93*, 97–103. https://doi.org/10.1016/j.paid.2015.08.007

Verstege, S., Pijeira-Díaz, H. J., Noroozi, O., Biemans, H., & Diederen, J. (2019). Relations between students' perceived levels of self-regulation and their corresponding learning behavior and outcomes in a virtual experiment environment. *Computers in Human Behavior, 100*, 325–334. https://doi.org/10.1016/j.chb.2019.02.020

You, J. W., & Kang, M. (2014). The role of academic emotions in the relationship between perceived academic control and self-regulated learning in online learning. *Computers & Education, 77*, 125–133. https://doi.org/10.1016/j.compedu.2014.04.018