



High school learning outcomes: The effect of self-regulation, resilience, and family environment

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ABSTRACT

Inspired by the poor Economics learning outcomes of students in state senior high schools (SSHS) in Cianjur regency, this study aims to determine and analyze self-regulation mediating the effect of resilience and family environment on student learning outcomes. It employed an explanatory survey with questionnaires and observations to collect the data. The population of this study comprises all grade XI social science students of SSHSs in Cianjur Regency, while the sample members selected randomly include 223 students. The data collected was then analyzed by using multiple linear regression analysis with the mediator variable. The results likely show that (i) resilience and family environment are in the high category, while self-regulation and learning outcomes are in the medium category. (ii) Both resilience and family environment influence self-regulation, and (iii) resilience, family environment, and self-regulation affect learning outcomes. (iv) Resilience affects learning outcomes either directly or indirectly through self-regulation. (v) Family environment likely influences learning outcomes directly or indirectly through self-regulation. The results of this study imply that the concepts of resilience, family environment, and self-regulation are relevant and can estimate student learning outcomes.

Keywords: high school learning outcomes, self-regulation, resilience, family environment

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INTRODUCTION

The disparity between the goals for educational achievement and the consequences of the learning process has made the issue of student learning outcomes significant for many concerns of the public. Learning outcomes as of late have grown to be a highly complicated issue. They have received extensive research in the hopes of lowering the high unemployment rate by increasing individuals' capacity to become successful (He et al., 2021). Potentially weak students become such a cause of disturbance and discomfort when the educational process is being performed. There are many causes and reasons for the gap in the achievement of student learning outcomes, one of which is seen in the student's score being below the normal average in a subject. Learning outcomes are significant for education, teachers, students, and researchers (Al-Zoubi & Younes, 2015).

Failure to achieve learning outcomes has been shown to result in low critical skill acquisitions and high unemployment rates (Khor et al., 2016; Zhang et al., 2017), which in aggregate, have the potential to affect the nation's economic growth and stability (Yi et al., 2012). In the era of globalization as it is today, education and technology development require superior quality of human resources. A researcher has determined that learning outcomes depend on general cognitive abilities, such as working memory, processing speed, and relational reasoning (Geary, 2011). Besides, learning outcomes are always associated with academic resilience, self-regulation, technology, past experiences, parental support, and resources (Kumi-Yeboah, 2020).

The grand theory of learning outcomes in this study is based on the cognitive psychology learning theory developed by Robert M. Gagne (Nara, 2017), namely Information-Processing Theory. In this information processing, there is an interaction between internal environmental conditions (Purwanto et al., 2022; Layco, 2020; Hong et al., 2020; Johnson et al., 2015) with individual external environmental conditions (Rahayu & Trisnawati, 2021; Ion et al., 2020; Tanjung, 2020; Afriyani, 2020; Umar et al., 2020; Lindfors et al., 2018; García et al., 2018; Hampden-Thompson & Galindo, 2017; Top et al., 2017; Long & Pang, 2016; J. & K., 2015; Cho & Campbell, 2011). According to Gagne, learning outcomes can be in the form of intellectual skills that allow a person to interact in the environment through the use of symbols or symbols, ideas, and cognitive strategies (Nara, 2017).

Although studied for decades, the factors that predict the achievement of predetermined learning outcomes require continuous research because the student population is constantly changing, and the criteria for learning success also vary from institution to institution (Obrentz & Commander, 2012). The introduction of the factors that influence learning outcomes is critical to help students achieve the best learning achievement. While learning and learning models, until now, have been useful for the advancement of education, P'Pool (2012) emphasizes the importance of identifying specific factors that contribute to student learning outcomes to assist educators in creating and utilizing effective teaching methods that will improve their learning outcomes. In addition, Robertson (2020) argues that knowledge of the factors that influence and predict student learning outcomes has substantial implications for their academic success. Learning outcomes are suggested to be achieved through self-regulation strategies, such as clarifying learning objectives and monitoring the learning process, which is then given reflection (Yan, 2020).

Student learning outcomes usually depend on general cognitive abilities, such as working memory, processing speed, and rational reasoning which have been shown to play a critical role in achieving learning outcomes (Geary, 2011). Some factors affecting student learning outcomes are divided into microsystem and macrosystem factors. The microsystem factor consists of traits from within students and the nature of their direct interaction with others, such as teachers and other students. Based on the microsystem factors, there are several determinants such as student resilience, cognitive and metacognitive factors, health, motivation, affective, and readiness (Rytönen et al. (2012). Macrosystem factors, on the other hand, include interactions that directly impact student learning outcomes. The following have been identified as the second important factors in supporting student success, including school climate, multicultural competence, good relations with positive values and norms, consultation time, training from partnerships and parents, setting vision, mission, values, and goals, professional development of teachers, teacher support, teacher evaluation, a mentor system, group discussion, and collaborative and democratic expectations.

Students' internal factors include health problems, physical disabilities, psychological factors (intelligence, interest in learning, attention, talent, motivation, maturity, and readiness of students), and fatigue. Meanwhile, external factors influencing student learning processes and outcomes include family, school, and community factors (Nurhasanah & Sobandi, 2016; Purnamasari et al., 2014). One of the main factors that influence learning outcomes is a such internal factor as resilience and a student's cognitive ability. Resilience is the ability of students to cope with academic setbacks, stress, and learning pressure related to school, which is manifested by internal and external factors (CN & FM, 2015). Past research has shown that resilience significantly affects schools and students' lives, including learning outcomes (Liu et al., 2022; Chen et al., 2022; Ramasubramanian et al., 2022).

The family environment, likewise, plays an essential role in supporting student learning outcomes by forming the character of a positive family environment; it will also develop students' interests, talents, and achievements in learning (Usman & Fadilah, 2020). The family environment dramatically contributes to the student's learning process. For learning without good and fun conditions, focusing on the subject matter to be studied will be challenging. Although some children can learn in a noisy atmosphere, they are busy and able to learn when accompanied by music. However, in essence, a person can study well and diligently in a calm, comfortable, safe,

peaceful atmosphere and a good mood, so that the surrounding condition does not interfere with an individual concentration on learning. Hence, a good family environment strongly influences the learning atmosphere, and Tanjung (2020) adds that it reflects harmonious parents and good communication between family members.

Regarding the explanation above, there is research that has contradictory results showing that the family environment has no relationship with student learning outcomes at school (Pappattu & Vanitha, 2017). While several other previous studies show the results of their research that there is a positive influence of the family environment on student learning outcomes Ion et al., 2020; Tanjung, 2020; Afriyani, 2020; Umar et al., 2020; Lindfors et al., 2018; Hampden-Thompson & Galindo, 2017; Top et al., 2017; Long & Pang, 2016; J. & K., 2015; Cho & Campbell, 2011). Thus, essentially a conducive and supportive family environment will impact students in carrying out their learning activities to be more productive for generating outputs in the form of optimal learning outcomes.

Self-regulation is an important predictor of student learning outcomes and motivation. Self-regulated learning creates opportunities for individuals to manage their resources and improve all learning processes (Banarjee & Kumar, 2014). According to Schunk, D. H., & Zimmerman, B. J. (2013), it can be said that self-regulated learning is interrelated with each other. The first is a metacognitive process in which students plan, set goals, organize, monitor, and evaluate their learning process. The second process is motivation, where students show high effort and persistence in their learning activities. The third process is behavior; in this case, students choose and create a learning environment to help optimal learning. Zimmerman explained that self-regulation is one factor that influences learning outcomes, where individuals will obtain satisfactory learning outcomes when they know effective ways of learning (Fitriya & Lukmawati, 2016). Learning outcomes are determined by students' interactions with their environment in the learning process, whether they are good or bad, depending on the learning strategies created (Atika et al., 2020; Sidik NH. & Winata, 2016).

Based on the results of previous research conducted by Cetin, B. (2015) shows the results of his research that self-regulation is not an important predictor that affects student learning outcomes. Meanwhile, several other previous researchers, who had research answers that contradicted this explanation, reported the results of their research that self-regulation had a positive relationship and influence on student learning outcomes (Jansen et al., 2019; Ergen & Kanadli, 2017; Morgan, 2013; Zheng). & Li, 2016; Vargas. G., & Martha 2020; Mutawah et al., 2017; Khan et al., 2020; Haftu Shaine, 2015; Hakiki & Qolby, 2019; Doostian et al., 2014; Yusuf, 2011).

Resilience in learning as found by Mohan (2020) is proven to have significant implications in that by using metacognitive independent learning strategies students develop such diverse skills as making effort, persevering, planning, and academic work. Resilience is positively correlated with metacognitive self-learning settings. In line with the findings of previous researchers, Artuch-Garde et al. (2017) found that the ability to self-regulate is the most crucial protective factor of resilience (learning resilience) that students can cultivate. Like learning from mistakes, self-regulation becomes a significant predictor of maintaining resilience to become more confident.

According to Krzensk (2018), self-regulation and resilience as skill sets that can be trained have been shown to positively affect student learning outcomes, especially with the effective use of self-regulation. Academic resilience has a direct effect on the use of self-regulatory strategies (i.e., regulation of effort, self-regulation, and time management), which affects learning outcomes (as measured by grade point average) (Johnson et al., 2015). Likewise, with the family environment, active parental involvement in the healthy development of students' personalities can only be achieved with a conducive atmosphere in the family. The family environment is significantly related to student self-regulation (Kadhiravan, 2020). Family influences children's readiness for school, provides stimulation for learning, provides enriched cultural and social experiences, helps develop more complex abilities, and motivates children to achieve higher goals. The important role of the family environment has an impact on the use of self-regulation or student learning strategies that are regulated. The family environment, therefore, is a strong

predictor of the use of self-regulation in the achievement of student learning outcomes (Kerr et al., 2021).

This study calls attention to the need to explore and identify the cause of the drop in student learning outcomes utilizing key variables or predictors that have a bearing on those results. To fix the issue, all sides must collaborate to come up with solutions, and it is crucial to find a solution to the issue of subpar student learning outcomes as soon as possible. The problem regarding student learning outcomes that have not been optimal, therefore, needs to be solved through an initial investigation that seeks to find out the factors that cause this problem to arise (Novianti & Supardi, 2018; Muizaddin & Santoso, 2016).

METHOD

This descriptive research employed an explanatory survey method with a quantitative approach. It aims to analyze self-regulation mediating the effect of resilience and family environment on student learning outcomes. To achieve its objectives, theories on resilience, family environment, and self-regulation are introduced to anticipate how these constructs relate to one another.

First, the resilience theory from Reivich & Shatte suggests that students can harness resilience for overcoming (increasing positive control abilities, living more motivated, productively, and happily, overcoming problems and learning pressure), bouncing back (belief can self-control back to normal), reaching out (meaningful experience and learning) (Purwanto et al., 2022). The effect of resilience on self-regulation strategies in learning is positive (Mohan & Verma., 2020). Resilience can also be defined as a person's ability to deal with obstacles, stress, and other difficult situations in overcoming academic problems. Resilience has a significant effect on student learning outcomes Layco (2020); Ifeoma & Chinaza (2020; Hong et al., 2020; Unachukwu, 2020; Ifeoma & Chinaza, 2020; Fang et al., 2020; Mwangi et al., 2018; Ergen & Kanadli, 2017; Johnson et al., 2016).

Secondly, the family environment is the foremost social environment that affects student learning activities because it plays a more critical role in paying attention to children's development, character building, educating, and providing guidance to children. It also positively affects the development and improvement of regulation or self-regulated learning by students (Kadhiravan, 2020; Shanwal & Gautam., 2014). The level of the family environment is related to the level of student self-regulation (Oloye & Flouri., 2021; Muwaga et al., 2020; Luszczynska et al., 2020) and significantly affects student learning outcomes (Tanjung, 2020; Afriyani, 2020; Umar et al., 2020; Lindfors et al., 2018). Families have an important role in cognitive, emotional, and social development, as well as collaborative work between students and their families), and Hakyemez (2020) adds that parents have an impact on academic activities. The home environment is likewise essential in shaping students' character; a positive family environment will also develop children's interests, talents, and achievements (Usman & Fadilah, 2020). The family environment's involvement in student learning positively impacts how students learn and is an essential factor for building success in achieving learning outcomes (Schunk, 2013).

Lastly, Bandura's concept places humans as individuals who can regulate themselves when learning (self-regulated learning) and influences behavior by regulating the environment and creating cognitive support (Alwisol, 2019). Self-regulation plays a role in mediating the relationship between the family environment and learning outcomes (Freddy et al., 2021). Students will grow smart if their parents always pay attention and encourage their children through enthusiasm, not just by providing material (Mahmudi et al., 2020), and students' good family environment and self-regulation skills can maximize their learning outcomes (Lau, E. Y. H., & Williams, 2021). Based on the literature, self-regulation consists of self-motivation, self-control, and self-evaluation has been shown to positively affect student learning outcomes (Schunk, 2013; Freddy et al., 2021; E. Hong et al., 2019; Barnard-Brak et al., 2016) and has a positive relationship and influence on student learning outcomes (Grijalva-Quiñonez et al., 2020; Khan et al., 2020; Bai & Wang, 2020); Jansen et al., 2019; Hakiki & Colby, 2019; Valinasab &

Zeinali, 2018; Ergen & Kanadli, 2017; Mutawah et al., 2017; Zheng & Li, 2016; Haftu Shaine, 2015; Doostian et al., 2014; Morgan, 2013; Yusuf, 2011).

Based on the explanation above, the relationship among these constructs is shown in Figure 1.

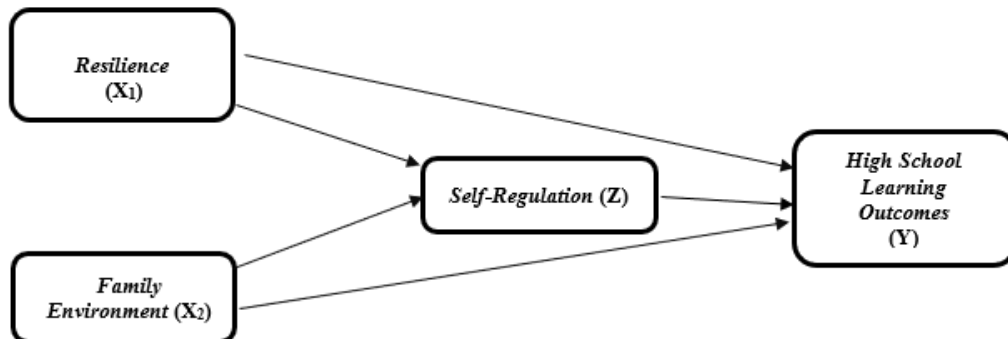


Figure 1. The Conceptual Model

Research instrument (questionnaire)

The questionnaire for the study comprises the studied exogenous and endogenous variables. The exogenous variables consist of three latent variables, namely (1) resilience (emotional regulation, impulse control, optimism, ability to analyze problems, empathy, and self-efficacy), (2) family environment (how parents educate kids, relationships among family members, home atmosphere, family economic situation, parents attention, and cultural background), and (3) self-regulation (personal function, behavioral function, and environmental function) (Magno, 2018). The endogenous variable in this study is High School Learning Outcomes.

Before distributing the questionnaires for further data collection, the quality of the research instruments was tested by using validity and reliability tests. The validity test used applied was the construct validity test (construct validity) which determines the validity by correlating the scores obtained for each item in the form of questions or questions with the total score. This total score is the value obtained from all item scores. The correlation between all item scores and their total score must be significant based on statistical measures. If it turns out that the scores of all items arranged based on the concept dimensions are correlated with the total score, it can be said that the measuring instrument has validity. Testing the correlation coefficient (r) was conducted with a significance level of 5%. The test results are said to be valid if the correlation coefficient is 0.3 with a significance level of less than 0.05.

Meanwhile, reliability testing was used to measure the questionnaire to be free from errors. The questionnaire is said to be reliable if the respondent answers each question consistently or is stable from time to time. The method used in reliability testing was Cronbach's Coefficient Alpha or Cronbach's Alpha in which the reliability coefficient shows how well the items in a set are positively correlated. Cronbach's Alpha is calculated regarding the average intercorrelation between measuring concepts. The closer the value of Cronbach's Alpha (α) to the value, the higher the reliability. The test results are reliable if Cronbach's Alpha value is more significant than 0.7. The results of the validity and reliability tests are shown in Table 1.

Table 1. Results of testing the validity and reliability of research instruments

Variable	Item No.	No. Invalid Items*	Alpha Coefficient**	Information
Resilience (X_1)	1-20	-	0.911	Valid & Reliable
Family Environment (X_2)	21-35	-	0.879	Valid & Reliable
Self-Regulation (Z)	36-48	-	0.906	Valid & Reliable

Based on Table 1, it is readily clear that all research variables are valid and reliable because the reliability value is more significant than Cronbach's Alpha coefficient of 0.70. Therefore, all

items in the instrument of this study are valid and reliable, and the questionnaire was ready to be used to collect the data.

Participants and data collection

The population of the study was all-state senior high school (SSHS) students in Cianjur Regency with a total of 491 people. To determine the representative sample size in this study, the solving approach was used to obtain a minimum sample size of 223. The final data set contains responses from 252 respondents from all distributed programs, as shown in Table 2.

The provided table depicts the students' demographics in terms of gender, age, parental education, and parents' job. As can be observed from the data, male students are slightly higher in number than females, and half of the participants are 17 years old (50%), followed by 41% aged 16. In terms of parents' background, most of them graduated from the level of primary, senior high, and junior high with percentages of 40%, 30%, and 26% respectively, leaving only 4% on the college degree level. Besides, almost half of the parents are self-employed (46%) and farmers (39%), while those working as civil servants are 20 (9%), and others have varied jobs (6%).

Table 2. Participants' demographics & parental information

	Frequency	Percentage
Gender		
a. Male	117	52
b. Female	102	48
Total	223	100
Age		
a. 16	92	41
b. 17	112	50
c. 18	19	9
Total	223	100
Parental Education		
a. Primary school	91	40
b. Junior High School	57	26
c. Senior High School	66	30
d. College (S1/S2/S3)	9	4
Total	223	100
Parents' Job		
a. Self-employed	103	46
b. Farmer	86	39
c. Civil servant	20	9
d. Other	14	6
Total	223	100

FINDING AND DISCUSSION

Finding

The regression model analysis aims to determine the direct effect of resilience (X1) on self-regulation (Z), the direct influence of the family environment (X2) on self-regulation (Z), the direct influence of resilience (X1) on learning outcomes (Y), the effect of directly from the family environment (X2) on learning outcomes (Y), the direct influence of self-regulation (Z) on learning outcomes (Y). This hierarchical regression analysis was used to see the difference between the regression without the mediating variable and the regression when entering the mediating variable and to see the difference between the regression without the mediating variable and the regression when entering the mediating variable. The results of all regressions of each model are enumerated in Table 3.

As seen in Table 3 the standardized beta values and the coefficient of determination (R) for each model are explained. In this research model, the family environment variable influences self-regulation by 41.1%, and the remaining 58.9% is influenced by other variables outside this study. The resilience variable affects learning outcomes by 75.3%, and other variables outside this research model influence the remaining 24.7%. The family environment variable influences learning outcomes by 53.1% and the remaining 46.9% is influenced by other variables outside this research model. The self-regulation variable affects learning outcomes by 45.7%, and other variables outside this model influence the remaining 54.3%.

When entering the mediating variable, a hierarchical regression equation is used to see the difference between a regression without a mediating variable and a regression. The results show that for model 6, resilience and the family environment had an effect of 55.2 percent without mediating variables. When entering the self-regulation mediation variable, it increases to 61.5 percent. This means that self-regulation dictates the influence of desalination and the family environment on student learning outcomes.

Table 3. Results of the regression model data analysis

				Coefficients				
Model	R	R ²	R2 Change	Unstandardized Coefficients		Standardized Coefficients	F (t)	Sig.
				B	Std. Error	Beta		
1	.743	.552						.000
(Constant)				8.770	2.193		3.011	.000
Resilience				.552	.033	.743	16.488	.000
2	.546	.411		6.024	3.048			.000
(Constant)							2.976	.019
Family Environment				.758	.045	.546	16.658	.000
3	.830	.753						.000
(Constant)				43.418	7.517		5.776	.000
Resilience				.303	.086	.830	3.513	.001
4	.692	.531						.000
(Constant)				46.595	7.976		5.842	.000
Family Environment				.346	.039	.692	2.909	.004
5	.238	.457						.000
(Constant)				45.752	6.604		6.928	.000
Self-regulation				.423	.116	.238	3.649	.000
6.1	.552	.509	.552					.000
(Constant)				8.770	2.193		3.011	.000
X ₁				.552	.033	.743	16.488	.000
6.2	.615	.555	.063					.000
(Constant)				41.071	7.464		5.372	.001
X ₁				.206	.029	.218	2.211	.003
Z				.268	.073	.251	2.547	.012
7.1	.411	.549	.411					.000
(Constant)				6.024	3.048		2.976	.019
X ₂				.758	.045	.546	16.658	.000
7.2	.468	.555	.057					.000
(Constant)				44.301	7.464		5.553	.000
X ₂				.158	.029	.232	2.326	.002
Z				.381	.073	.215	2.182	.030

Based on the regression test analysis of the three equations, if analyzed using the Causal Step method, self-regulation (Z) can be said to meet the criteria or requirements as a mediating

variable. This can be seen from the following criteria (1) In equation 1, resilience (X1) and family environment (X2) affect learning outcomes (Y), (2) In equation 2, resilience (X1) and family environment (X2) affect self-regulation (Z), and (3) In equation 3, self-regulation (Z) affects student learning outcomes (Y).

Judged from the three equations above, the analysis of the mediating variable using the simple step method found that 1) The resilience variable (X1) has a significant effect on student learning outcomes (Y) and remains significant by including self-regulation (Z) as a mediating variable. This shows that self-regulation can mediate the effect of resilience on student learning outcomes partially or partially. 2) The family environment variable (X2) has a significant effect on student learning outcomes (Y) and remains significant by including self-regulation (Z) as a mediating variable. This shows that self-regulation can partially mediate the influence of the family environment on student learning outcomes

Discussion

Effect of resilience on self-regulation

As presented in the previous section, the results of this study show that resilience has a positive and significant effect on student self-regulation, meaning that the higher the resilience, the higher the self-regulation that students will achieve. The results of this study strengthen the results of Mohan's (2020), which states that learning resilience has proven to have significant implications, that by using independent learning strategies, students develop various skills, such as making effort, persevering, planning, and performing academic work. Resilience is positively correlated with self-study settings or self-regulation. In accordance with this, Artuch-Garde et al. (2017) discovered that the most crucial protective element of resilience (learning resilience) that students may build is the capacity for self-regulation. Resilience and the ability to learn from mistakes are important indicators of stronger self-regulation. In order to develop self-regulation or self-confidence to choose autonomous and effective learning practices, resilience can serve as a benchmark.

Furthermore, the results of this study are in line with those of Mohan & Verma (2020) when examining the effect of resilience on self-regulation strategies in learning, showing that there is a significant positive effect between resilience and self-regulation in student learning. Resilience is one of the qualities that can motivate students to develop strong self-control since it will increase students' self-assurance in their skills, optimism, and ability to perceive prospects for success so they can cope with current learning challenges on academic tasks. According to Reivich and Shatte's resilience theory, students may utilize resilience to overcome (increase their capacity for positive control), bounce back (restore their confidence in their ability to maintain self-control), and reach out (engage in meaningful experiences and learning) (Purwanto et al., 2022).

The effect of family environment on self-regulation

In line with the findings of the study, the family environment has a favorable and substantial impact on students' ability to self-regulate; the better the family environment, the better the students' ability to self-regulate. The home environment is crucial in forming learners' character, and children's interests, talents, and accomplishments will all grow in a healthy family context (Usman & Fadilah, 2020). Family and home are beneficial environments for fostering independence and self-control in learning. When the quality of communication and support from their home environment is good to assist them accomplish in learning, students will have efficient ways to study successfully. Growing self-regulation for independent learning can also be assessed against the home context. According to a study (Shanwal & Gautam, 2014), the family atmosphere encourages overcoming obstacles and finishing tasks. The home environment has a positive influence on a student's ability to manage or increase their own learning (Kadhiravan, 2020). Student self-regulation is correlated with the quality of the parental environment (Oloye & Flouri, 2021; Muwaga et al., 2020; Luszczynska et al., 2020).

The effect of resilience on learning outcomes

The results likewise demonstrate that student learning outcomes are positively and significantly impacted by resilience. Students will perform better academically the more resilient they are. Students with strong resilience can learn from failure and use the experience to create greater ideals if they realize that failure does not mean the end of the world. Even in difficult circumstances, students can achieve academic success in a classroom setting. Students with high resilience believe they can work well and tend to see difficult things as something to be mastered rather than something to be avoided.

On the other hand, when students' resilience is lacking, the ability to participate in the learning process, and overcome the problem of complex learning tasks, will not be adequately resolved and can result in less-than-optimal learning outcomes. Students with a good level of resilience will have the confidence to continue to rise and always try to survive under pressure, adapt, live more motivated, be productive in learning, broaden their horizons, and assume that mistakes are not the end of everything. This study strengthens Layco's (2020) and Ifeoma & Chinaza's (2020) suggesting that resilience significantly affects student learning outcomes. In the context of education, resilience is a person's ability to deal with obstacles, stress, and other difficult situations in overcoming academic problems. It, as suggested by a number of researchers, has a positive relationship and influence on learning outcomes (Hong et al., 2020; Unachukwu, 2020; Ifeoma & Chinaza, 2020; Fang et al., 2020; Mwangi et al., 2018; Ergen & Kanadli, 2017; Johnson et al., 2015).

The effect of family environment on learning outcomes

The findings indicate that the family setting had a positive and significant impact on the learning outcomes of students. Students will succeed more effectively if the more supportive their families are of them. Students are better able to solve challenges on poorly understood subjects if they grow up in a supportive family setting. The family setting is the primary social context that influences how well students learn because families devote more time to supporting children's growth, fostering good character, educating them, and offering them advice. Students from well-adjusted families will always have the tenacity to do their hardest, adapt, be more motivated, and take their involvement in the educational process seriously. This findings likely conform with previous ones suggesting that the family environment significantly influences student learning outcomes (Tanjung, 2020; Afriyani, 2020; Umar et al., 2020; Lindfors et al., 2018; García et al., 2018; Hampden-Thompson & Galindo, 2017; Top et al., 2017; Long & Pang, 2016; Jayanthi & Srinivasan, 2015; Cho & Campbell, 2011). Teachers/mentors and other people can affect student learning outcomes and motivation (Sacntrock, 2015).

The effect of self-regulation on learning outcomes

The results showed that self-regulation positively and significantly affected student learning outcomes. The higher the self-regulation, the higher the learning outcomes that students will achieve. High self-regulation can contribute significantly to applying the learning plans and goals to be achieved. *Self-regulation* is an essential and fundamental skill that students must possess to contribute to their learning outcomes through the learning process. People who have self-regulation will see themselves as competent, successful, have good social attitudes, satisfied, robust and independent. Conformity between thoughts, feelings, and actions is a critical component of making the arrangement structured and directed so that it can follow the learning process optimally, which has an impact on increasing learning success.

Bandura's concept places humans as individuals who can regulate themselves when learning (self-regulated learning), influence behavior by regulating the environment, and create cognitive support (Alwisol, 2019). Self-regulation is one of the factors that influence learning outcomes, where individuals will obtain satisfactory learning outcomes when they are aware of and know effective ways of learning, and self-regulation is generally understood as metacognitive awareness which includes knowledge of tasks, competencies, interests, and attitudes, as well as procedural knowledge (Schunk, 2013). This results align with previous researchers who stated

that self-regulation has a positive relationship and effect on student learning outcomes (Grijalva-Quíñonez et al., 2020; Khan et al., 2020; Bai & Wang, 2020); Jansen et al., 2019; Hakiki & Qolby, 2019; Valinasab & Zeinali, 2018; Ergen & Kanadli, 2017; Mutawah et al., 2017; Zheng & Li, 2016; Haftu Shaine, 2015; Doostian et al., 2014; Morgan, 2013; Yusuf, 2011).

The influence of family environment on learning outcomes

The study's results also indicate that the family environment influences student learning outcomes directly and indirectly through the mediation of self-regulation. Indirectly, the family environment affects student learning outcomes through self-regulation. The more conducive the students' family environment, the higher the learning outcomes they achieve indirectly through self-regulation. Increased self-regulation in students is closely related to resilience or learning resilience. The students' family environment determines self-regulation, and the involvement of this family environment is a natural form of family relationships with students. Families play an essential role in cognitive, emotional, and social development, as well as collaborative work between students and parents, which impacts academic activities (Hakyemez, 2020). The family environment's involvement in student learning positively impacts how students learn and is a critical factor for building success in achieving learning outcomes (Schunk, 2013).

Besides, self-regulation plays a role in mediating the relationship between the family environment and learning outcomes (Freddy et al., 2021), and learning outcomes are closely related to the family environment. Students will grow smart if their parents always pay attention and give encouragement in the form of enthusiasm to their children, not just providing financial support (Mahmudi et al., 2020). A good family environment and good self-regulation skills in students can maximize their learning outcomes (Lau & Williams, 2021). Self-regulated learning characterizes reflective individuals with learning strategies who can manage behavior well. Self-regulation, consisting of self-motivation, self-control and self-evaluation, has been shown to have a positive relationship with student learning outcomes (Schunk, 2013). The results of this study strengthen the results of previous investigations mentioning that self-regulation was a mediator of the influence of the family environment on learning outcomes (Freddy et al., 2021; Hong et al., 2019; Barnard-Brak et al., 2016).

CONCLUSION

Based on previous results and discussion, the study would conclude that (i) resilience and family environment are in the high category, while self-regulation and learning outcomes are in the medium category. (ii) Resilience and family environment influence self-regulation, and both of them also influences learning outcomes. (iii) Self-regulation likely affects learning outcomes. (iv) Resilience affects learning outcomes either directly or indirectly through self-regulation, and (v) family environment influences learning outcomes directly or indirectly through self-regulation.

The results of this study imply that the concepts of resilience, family environment, and self-regulation are relevant and can estimate student learning outcomes. Thus, Reivich and Shatte's theory of resilience, and Albert Bandura's social cognitive theory of social cognition regarding the concept of resilience, family environment, and self-regulation, are all relevant and can be used to estimate student learning outcomes. Moreover, both resilience and a conducive family environment are needed to improve student learning outcomes, provided that self-regulation is strengthened.

This research, however, is limited to resilience, family environment, and self-regulation as the exogenous variable that affects student learning outcomes as endogenous variables. It does not examine other variables that may have a more significant influence on enhancing learning outcomes. Therefore, the researcher recommends further research using other variables using mediation and moderation models.

REFERENCES

- Ariyanti, N. S., & Dahlan, D. (2019). *Self Regulated Learning Effect on Learning Outcomes in Moderated Student Learning Motivation*. 65(Icebef 2018), 158–161. <https://doi.org/10.2991/icebef-18.2019.38>
- Al-Zoubi, S. M., & Younes, M. A. B. (2015). Low Academic Achievement: Causes and Results. *Theory and Practice in Language Studies*, 5(11), 2262. <https://doi.org/10.17507/tpls.0511.09>
- Alwisol. (2019). *Psikologi Kepribadian (Edisi Revisi)*. UMM Press. <https://ummpress.umm.ac.id/katalog/detail/psikologikepribadianedisirevisi.html>
- Artuch-Garde, R., González-Torres, M. del C., de la Fuente, J., Mariano Vera, M., Fernández-Cabezas, M., & López-García, M. (2017). Relationship between resilience and self-regulation: A study of Spanish youth at risk of social exclusion. *Frontiers in Psychology*, 8(APR), 1–11. <https://doi.org/10.3389/fpsyg.2017.00612>
- Atika, A., Machmud, A., & Suwatno, S. (2020). Pendekatan Meta-Analisis : Blended Learning terhadap Hasil Belajar DI Era Covid-19. *Jurnal Basicedu*, 4(4), 919–926. <https://doi.org/10.31004/basicedu.v4i4.488>
- Bai, B., & Wang, J. (2020). The role of growth mindset, self-efficacy and intrinsic value in self-regulated learning and English language learning achievements. *Language Teaching Research*. <https://doi.org/10.1177/1362168820933190>
- Banarjee, P., & Kumar, K. (2014). International Journal of Multidisciplinary Approach and Studies A Study on Self-Regulated Learning and Academic Achievement among the Science Graduate Students. *International Journal of Multidisciplinary Approach & Studies*, 1(6), 329–342.
- Barnard-Brak, L., Paton, V. O., & Lan, W. Y. (2016). Self-regulation across time of first-generation online learners. *ALT-J: Research in Learning Technology*, 18(1), 61–70. <https://doi.org/10.1080/09687761003657572>
- Cetin, B. (2015). Academic motivation and self-regulated learning in predicting academic achievement in college. *Journal of International Education Research*, 11(2), 95–106.
- CN, M., & FM, O. (2015). Relationship between Academic Resilience and Academic Achievement among Secondary School Students in Kiambu County, Kenya. *International Journal of School and Cognitive Psychology*, 01(s2). <https://doi.org/10.4172/2469-9837.s2-003>
- Chen, D. L., Ertac, S., Evgeniou, T., Miao, X., Nadaf, A., & Yilmaz, E. (2022). Grit and Academic Resilience During the Covid-19 Pandemic. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4001431>
- Choe, D. E., Olson, S. L., & Sameroff, A. J. (2019). Effects of early maternal distress and parenting on the development of children's self-regulation and externalizing behavior. *Development and Psychopathology*, 25(2), 437–453. <https://doi.org/10.1017/S0954579412001162>
- Doostian, Y., Fattahi, S., Goudini, A. A., A'zami, Y., Massah, O., & Daneshmand, R. (2014). The Effectiveness of self-regulation in students' academic achievement motivation. *Practice in Clinical Psychology*, 2(4), 261–270.
- Ergen, B., & Kanadli, S. (2017). Öz düzenlemeli öğrenme stratejilerinin akademik başarıya etkisi: Bir meta analiz çalışması. *Eğitim Arastirmalari - Eurasian Journal of Educational Research*, 2017(69), 55–74. <https://doi.org/10.14689/ejer.2017.69.4>
- Fang, G., Chan, P. W. K., & Kalogeropoulos, P. (2020). Social support and academic achievement of Chinese low-income children: A mediation effect of academic resilience. *International Journal of Psychological Research*, 13(1), 19–28. <https://doi.org/10.21500/20112084.4480>
- Freddy, F., Lestari, S., & Prihartanti, N. (2021). Self-regulated learning sebagai mediator keterlibatan orang tua dan prestasi akademik siswa SMA. *Persona: Jurnal Psikologi Indonesia*, 10(1), 1–15. <https://doi.org/10.30996/persona.v10i1.4321>
- Geary, D. C. (2011). Consequences, characteristics, and causes of mathematical learning disabilities and persistent low achievement in mathematics. *Journal of Developmental and*

- Behavioral Pediatrics*, 32(3), 250–263. <https://doi.org/10.1097/DBP.0b013e318209edef>
- Grijalva-Quiñonez, C. S., Valdés-Cuervo, A. A., Parra-Pérez, L. G., & García Vázquez, F. I. (2020). Parental involvement in Mexican elementary students' homework: Its relation with academic self-efficacy, self-regulated learning, and academic achievement. *Psicologia Educativa*, 26(2), 129–136. <https://doi.org/10.5093/PSED2020A5>
- Haftu Shaine, M. (2015). The Effect of Self-Regulated Learning Strategies and Self-Efficacy on Academic Achievement of Primary School Students. *Psychology and Behavioral Sciences*, 4(3), 107. <https://doi.org/10.11648/j.pbs.20150403.14>
- Hakyemez, S. (2020). Turkish early childhood educators on parental involvement. *European Educational Research Journal*, 14(1), 100–112. <https://doi.org/10.1177/1474904114565152>
- Hakiki, T., & Qolby, A. R. C. (2019). *The Effect of Self-Regulated Learning on Academic Achievement Among Hafiz Students*. 304(Acpch 2018), 197–200. <https://doi.org/10.2991/acpch-18.2019.49>
- Hampden-Thompson, G., & Galindo, C. (2017). School–family relationships, school satisfaction and the academic achievement of young people. *Educational Review*, 69(2), 248–265. <https://doi.org/10.1080/00131911.2016.1207613>
- He, X., Wang, H., Chang, F., Dill, S. E., Liu, H., Tang, B., & Shi, Y. (2021). IQ, grit, and academic achievement: Evidence from rural China. *International Journal of Educational Development*, 80(November 2020), 102306. <https://doi.org/10.1016/j.ijedudev.2020.102306>
- Hong, E., Peng, Y., & Rowell, L. L. (2019). Homework self-regulation: Grade, gender, and achievement-level differences. *Learning and Individual Differences*, 19(2), 269–276. <https://doi.org/10.1016/j.lindif.2008.11.009>
- Hong, S.-H., Kim, J.-S., Ju, D.-B., & Author, C. (2020). The Effect of Resilience on Academic Stress and Academic Achievement in Nursing Students. *Journal of the Korea Convergence Society*, 11(9), 443–450. <https://doi.org/10.15207/JKCS.2020.11.9.443>
- Ifeoma, E., & Chinaza, K. (2020). *Unachukwu, G. C., Anierobi, Elizabeth Ifeoma, Nwosu, Kingsley Chinaza & Okeke, Nkechi Uzochukwu*. 116–130.
- Ion, I. E., Lupu, R., & Nicolae, E. (2020). Academic achievement and professional aspirations: between the impacts of family, self-efficacy and school counselling. *Journal of Family Studies*, 0(0), 1–24. <https://doi.org/10.1080/13229400.2020.1746685>
- Jayanthi, J., & Srinivasan, K. (2015). Influence of home environment on academic achievement in Mathematics. *IOSR Journal of Mathematics*, 11(4), 26-31. <https://doi.org/10.9790/5728-11422631>
- Jansen, R. S., van Leeuwen, A., Janssen, J., Jak, S., & Kester, L. (2019). Self-regulated learning partially mediates the effect of self-regulated learning interventions on achievement in higher education: A meta-analysis. *Educational Research Review*, 28(September), 100292. <https://doi.org/10.1016/j.edurev.2019.100292>
- Johnson, M. L., Taasobshirazi, G., Kestler, J. L., & Cordova, J. R. (2015). Models and messengers of resilience: a theoretical model of college students' resilience, regulatory strategy use, and academic achievement. *Educational Psychology*, 35(7), 869–885. <https://doi.org/10.1080/01443410.2014.893560>
- Kadhiravan. (2020). Influence Of Family Environment On The Students ' Use Of Self-Regulated Learning Strategies. *Journal of Educational Psychology*, 5(1).
- Kerr, M. L., Rasmussen, H. F., Smiley, P. A., Buttitta, K. V., & Borelli, J. L. (2021). The development of toddlers' emotion regulation within the family system: associations with observed parent-child synchrony and interparental relationship satisfaction. *Early Childhood Research Quarterly*, 57, 215–227. <https://doi.org/10.1016/j.ecresq.2021.06.004>
- KKrzensk, A. (2018). Influencing academic resilience and self-regulation in students: An intervention in mathematics. In *Churchie-Libraries*. <https://www.churchie.com.au/academic/churchie-libraries>
- Khan, Y. M., Shah, M. H., & Sahibzada, H. E. (2020). Impact of self-regulated learning behavior on the academic achievement of university students. *FWU Journal of Social Sciences*,

14(2), 117–130.

- Khor, K. S., Udin, Z. M., Ramayah, T., & Hazen, B. T. (2016). Reverse logistics in Malaysia: The Contingent role of institutional pressure. *International Journal of Production Economics*, 175, 96–108. <https://doi.org/10.1016/j.ijpe.2016.01.020>
- Kumi-Yeboah, A. (2020). Educational Resilience and Academic Achievement of Immigrant Students From Ghana in an Urban School Environment. *Urban Education*, 55(5), 753–782. <https://doi.org/10.1177/0042085916660347>
- Lau, E. Y. H., & Williams, K. (2021). Emotional regulation in mothers and fathers and relations to aggression in hong kong preschool children. *Advance Online Publication*. <https://psycnet.apa.org/doi/10.1007/s10578-021-01165-y>
- Layco, E. P. (2020). Discerning the Intervening Roles of Students Mathematical Resilience and Academic Emotions between the Relationship of Home-School Ecological Structures and Achievement. *International Journal of Innovation, Creativity and Change*. *Www.Ijicc.Net*, 14(8), 439–469. www.ijicc.net
- Liu, Y., Zhao, L., & Su, Y.-S. (2022). The Impact of Teacher Competence in Online Teaching on Perceived Online Learning Outcomes during the COVID-19 Outbreak: A Moderated-Mediation Model of Teacher Resilience and Age. *International Journal of Environmental Research and Public Health*, 19(10), 6282. <https://doi.org/10.3390/ijerph19106282>
- Luszczynska, A., de Wit, J. B. F., de Vet, E., Januszewicz, A., Liszewska, N., Johnson, F., Pratt, M., Gaspar, T., de Matos, M. G., & Stok, F. M. (2020). At-Home Environment, Out-of-Home Environment, Snacks and Sweetened Beverages Intake in Preadolescence, Early and Mid-Adolescence: The Interplay Between Environment and Self-Regulation. *Journal of Youth and Adolescence*, 42(12), 1873–1883. <https://doi.org/10.1007/s10964-013-9908-6>
- Lindfors, P., Minkkinen, J., Rimpelä, A., & Hotulainen, R. (2018). Family and school social capital, school burnout and academic achievement: a multilevel longitudinal analysis among Finnish pupils. *International Journal of Adolescence and Youth*, 23(3), 368–381. <https://doi.org/10.1080/02673843.2017.1389758>
- Long, H., & Pang, W. (2016). Family socioeconomic status, parental expectations, and adolescents' academic achievements: a case of China. *Educational Research and Evaluation*, 22(5–6), 283–304. <https://doi.org/10.1080/13803611.2016.1237369>
- Mahmudi, A., Sulianto, J., & Listyarini, I. (2020). Hubungan Perhatian Orang Tua Terhadap Hasil Belajar Kognitif Siswa. *Jurnal Pedagogi Dan Pembelajaran*, 3(1), 122. <https://doi.org/10.23887/jp2.v3i1.24435>
- Mohan, V. (2020). Self-Regulated Learning Strategies Self-Regulated Learning Strategies in Relation To Academic Resilience. *Voice of Research*, 9(3), 27–34.
- Mohan, V., & Verma, M. (2020). *Examining the Relationship between Learning Strategies and the Four C's of Academic Resilience among School Students*. 9(5), 1419–1424. <https://doi.org/10.21275/SR20517111714>
- Morgan, S. E. (2013). *Self Regulation And Cultural Orientation On The Academic Achievement Of University Students On Distance Education In Kampala, Uganda*. 2(4), 1–8.
- Mutawah, A., Thomas, R., & Khine. (2017). Investigation into Self-regulation , Engagement in Learning Mathematics and Science and Achievement among Bahrain ... *International Electronic Journal of Mathematics Education*, 12(3), 633–653. <https://www.iejme.com/article/investigation-into-self-regulation-engagement-in-learning-mathematics-and-science-and-achievement>
- Muwaga, M., Nashori, F., & Sholeh, A. (2020). The Impact of Social Environment on the Sexual Self-Regulation of University Students in Uganda. *International Journal of Islamic Educational Psychology*, 1(2), 75–88. <https://doi.org/10.18196/ijiep.v1i2.10011>
- Muizaddin, R., & Santoso, B. (2016). Model Pembelajaran Core Sebagai Sarana Dalam Meningkatkan Hasil Belajar Siswa. *Jurnal Pendidikan Manajemen Perkantoran*, 1(1), 224. <https://doi.org/10.17509/jpm.v1i1.3470>
- Mwangi Nyambura Cecilia., Anthony Muriithi Ireri., Elizabeth W, Mwaniki., Wambugu, S. K. (2018). Relationship Among Type Of School, Academic Resilience And Academic Achievement Among Secondary School Students In Kiambu County, Kenya. *International*

Journal of Social Sciences, 3(3), 1092–1107.

- Novianti, S. D., & Supardi, E. (2018). Kompetensi pedagogik guru dan motivasi belajar siswa sebagai determinan terhadap hasil belajar siswa. *Jurnal Pendidikan Manajemen Perkantoran*, 4(1), 107. <https://doi.org/10.17509/jpm.v4i1.14961>
- Obrentz, S. B., & Commander, N. (2012). Predictors of science success: The impact of motivation and learning strategies on college chemistry performance. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 3501091, 2020. https://search.proquest.com/docview/926827403?accountid=16285%0Ahttp://br9xy4lf5w.search.serialssolutions.com?ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rft_id=info:sid/Education+Database&rft_val_fmt=info:ofi/fmt:kev:mtx:dissertation&rft.genre=dissert
- Oloye, H. T., & Flouris, E. (2021). The role of the indoor home environment in children's self-regulation. *Children and Youth Services Review*, 121, 105761. <https://doi.org/10.1016/j.childyouth.2020.105761>
- Pappattu, J., & Vanitha, J. (2017). a Study on Family Environment and Its Effect on Academic Achievement in Science Among Secondary School Students. *International Journal of Research -GRANTHAALAYAH*, 5(6), 428–436. <https://doi.org/10.29121/granthaalayah.v5.i6.2017.2052>
- P'Pool, K. B. (2012). *Using Dweck's Theory of Motivation to Determine How a Student's View of Intelligence Affects Their Overall Academic Achievement*. 49. <http://digitalcommons.wku.edu/theses%0Ahttp://digitalcommons.wku.edu/theses/1214>
- Purwanto, F., Mujanah, S., & Sumiati, S. (2022). the Effect of Self-Leadership, Self-Ability and Resilient on the Performance of Surabaya Satreskrim Police Investigators Through Organizational Commitments As Intervening Variables. *Business and Finance Journal*, 7(1), 45–60. <https://doi.org/10.33086/bfj.v7i1.2739>
- Rahayu & Trisnawati. (2021). Pengaruh Lingkungan Keluarga dan Fasilitas Belajar Terhadap Prestasi Akademik Melalui Motivasi Belajar. *Jurnal Ilmiah Kependidikan*, 2(2), 212–224.
- Rytönen, H., Pärpala, A., Lindblom-Ylänne, S., Virtanen, V., & Postareff, L. (2012). Factors affecting bioscience students' academic achievement. *Instructional Science*, 40(2), 241–256. <https://doi.org/10.1007/s11251-011-9176-3>
- Ramasubramanian, M., Patel, D., Turner, M. R., & Ybarra, V. (2022). The influence of life narrative themes on resilience and life outcomes. *Personality and Individual Differences*, 185(August 2021), 111235. <https://doi.org/10.1016/j.paid.2021.111235>
- Sacntrock, J. (2015). *Psikologi Pendidikan Edisi Kedua*. Kencana.
- Shanwal*, S. M. and V. K., & Gautam. (2014). Role of Family Environment in Developing Self Efficacy of Adolescents. *Integrated Journal of Social Sciences*, 1(Supplement 1), 28–30. <https://doi.org/http://dx.doi.org/10.1111/fcp.12370>
- Schunk, D. H. (2013). Self-Regulation and Learning. In *Handbook of Psychology, Second Edition*. *Handbook of Psychology, Second Edition*.
- Schunk, D. H., & Zimmerman, B. J. (2013). Self-regulation and learning. In W. M. Reynolds, G. E. Miller, & I. B. Weiner (Eds.), *Handbook of psychology: Educational psychology* (pp. 45–68). John Wiley & Sons, Inc..
- Tanjung, A. (2020). Influence Of Family Environment Against Student Achievement In Class Vii Smp Negeri 1 Barus. *Wahana Inovasi Pendidikan*, 9(1).
- Top, N., Liew, J., & Luo, W. (2017). Family and School Influences on Youths' Behavioral and Academic Outcomes: Cross-Level Interactions between Parental Monitoring and Character Development Curriculum. *Journal of Genetic Psychology*, 178(2), 108–118. <https://doi.org/10.1080/00221325.2017.1279118>
- Usman & Fadilah. (2020). The Effect of Family Environment, Environmental Campus, Motivation and Learning to Learn Student Behavior. *SSRN Electronic Journal*. <https://doi.org/https://dx.doi.org/10.2139/ssrn.3510669>
- Usman, O., & Fadilah, R. N. (2020). The Effect of Family Environment, Environmental Campus, Motivation and Learning to Learn Student Behavior. *SSRN*, 1–14.
- Unachukwu, G. C. at al. (2020). Influence of Academic Self-efficacy and Resilience on

- Academic Achievement Among Secondary School Students in Aguata LGA, Anambra State, Nigeria. *Journal of The Nigerian Academy of Education*, 16(2).
- Umar, E., Fip, P., Makalunsenge, F., & Fip, P. (2020). *Novateur Publications International Journal of Innovations in Engineering Research and Technology [Ijiert] the Influence of the Family Environment on Student Learning Outcomes in Ips Lesson in Sdn 83 Kota Tengah Kota Gorontalo*. 7(12), 155–161.
- Yan, Z. (2020). Self-assessment in the process of self-regulated learning and its relationship with academic achievement. *Assessment and Evaluation in Higher Education*, 45(2), 224–238. <https://doi.org/10.1080/02602938.2019.1629390>
- Yi, S. K. M., Steyvers, M., Lee, M. D., & Dry, M. J. (2012). The Wisdom of the Crowd in Combinatorial Problems. *Cognitive Science*, 36(3), 452–470. <https://doi.org/10.1111/j.1551-6709.2011.01223.x>
- Yusuf, M. (2011). The impact of self-efficacy, achievement motivation, and self-regulated learning strategies on students' academic achievement. *Procedia - Social and Behavioral Sciences*, 15, 2623–2626. <https://doi.org/10.1016/j.sbspro.2011.04.158>
- Zhang, J., Kuusisto, E., & Tirri, K. (2017). How Teachers' and Students' Mindsets in Learning Have Been Studied: Research Findings on Mindset and Academic Achievement. *Psychology*, 08(09), 1363–1377. <https://doi.org/10.4236/psych.2017.89089>
- Zheng, L., & Li, X. (2016). The effects of motivation, academic emotions, and self-regulated learning strategies on academic achievements in technology-enhanced learning environment. *Proceedings - IEEE 16th International Conference on Advanced Learning Technologies, ICALT 2016*, 376–380. <https://doi.org/10.1109/ICALT.2016.128>