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Effect of Self-regulation on Academic Resilience Mediated by Perceived Competence

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Abstract

Introduction: Self-regulated learning facilitates resilience by controlling learning and creating self-confidence. This study was conducted to investigate the relationship between self-regulation and academic resilience with the mediating role of perceived competence.

Method: The target population of the study included under graduate students from Tehran universities during the academic year of 2019-2020. The sample consisted of 360 students who were selected through random cluster sampling. The instruments used in this study were Perceived Competence scale, Self-regulation scale, and Academic Resiliency questionnaire. The research method used in this study was casual modeling.

Result: The results revealed that self-regulation had a direct effect on predicting academic resiliency. Also, because the total effect of self-regulation was more than its direct effect on academic resilience, a mediating role is probable. Perceived competence mediated the relationship between self-regulation and academic resilience and promoted it.

Conclusion: Through resilience, the educational process can be facilitated even in difficult and challenging situations and prevent academic failure and boredom.

Keywords: Academic Resilience, Perceived Competence, Self-regulation

Introduction

One of the missions of education and educational institutions is to empower capable people who can act efficiently in unpredictable and threatening situations. Such a mission is influenced by many factors and students' success and failure would affect their future. Education administrators have always sought ways to deal with problems in an appropriate way. Accordingly, one of the concerns of educators and educational institutions is to identify and nurture the factors that affect students' academic success and reduce the problematic factors that influence failure. Many studies have shown that there are students who, despite being in stressful, problematic and threatening situations, succeed and attain high levels of education [1, 2] and this process is called academic resilience.

Studies on resilience have helped change the sociological and health science paradigms. Instead of focusing on risk factors, more attention is now focused on personal competencies, which is why resilience is closely linked to the goals of positive psychology research [3]. Connor and Davidson [4] has described resilience as a person's ability to practice biological, psychological, and spiritual balance in risky situations. Resilience is defined as the ability to overcome difficulties and difficult situations [5]. Hart and Gagnon [6] express resilience as overcoming adversity and the ability to manipulate them. In early research, resilience was considered as a one-dimensional structure, but in recent years,

because of the complexity of its structure, different dimensions have been considered for resilience. Actually, resilience has educational, behavioral and emotional dimensions [7].

Numerous studies have shown that the emergence of a resilient role in the educational aspect of students who were predicted to experience academic failure and eventually drop out of school, has enabled them to succeed at school and progress to higher levels of education [8]. Academic resilience is defined as the student's ability to cope with academic failure, stress, and pressure [8]. Martin and Marsh [9] defined academic resilience as the students' ability to overcome acute and chronic risks that pose major threats to the learning process. They consider resilience as a part of the academic life in students who face challenges. Therefore, the main focus of research in the field of academic resilience is to identify the factors affecting the growth of resilience. These factors have been conceptualized as protective, promoting, encouraging, and facilitating factors. Martin has designed the learner cycle model and thus explains the underlying thoughts and feelings and behaviors related to academic motivation. He states that by increasing the motivating factors and reducing the demotivating factors, resilience can be achieved in a certain educational domain.

The first component is to create and increase self-confidence in learners. Providing opportunities for success and experience in the learner increases learners' self-confidence. Gradually, learners can plan for success and believe that the key to progress depends on trying and using strategies that are under their control and authority. In other words, they will have control over their educational status. A sense of mastery of one's circumstances and belief in success leads to more effort, so that one does not give up easily. Therefore, they are more committed to mastering the learning educational content and are less affected by the fear of failure. In this way, Martin states that academic resilience is comprised of self-confidence, feeling of control, low anxiety (self-control), and persistence (commitment) [10].

Academic resilience is multifactorial. In some definitions, resilience has been introduced as a personal characteristic and in others it has been described as an interactive process [11]. Various studies support the role of individual factors on academic resilience. One personal competence that seems to be specifically related to people's resilience is their level of self-regulation [12, 13]. Although there are different meanings of self-regulation in the literature, most of them seem to agree that self-regulation is the ability to maintain the effort to strive towards the desired goals, while controlling sudden temptations [14, 15].

Self-regulation is an umbrella structure that brings together many competencies[16]. Personal orientation, adaptability, self-management, problem solving, critical thinking, communication and social skills are the processes that guide individuals in achieving goals (which requires skill and desire). Through being active, controlling, inhibiting, protecting and adapting one's behavior, emotions, motivation, and cognition and metacognition strategies and external resources, one pursues desired goals [17].

Learners who use self-regulated learning strategies are actively involved in learning metacognitively, motivationally, and behaviorally [18]. They choose strategies that fit their purpose and constantly monitor their progress toward those goals. This helps students to be resilient when they see a link between their effort and their strategies and academic outcomes [10].

Artuch Garde conducted a study on the relationship between resilience and self-regulation in Spanish adolescents at risk of social exclusion [19]. In this study, self-regulation was considered as an important protective factor in threatening situations and was included in resilience programs. In a study by, Dishion et al. resilience was predicted by learning self-regulation [13]. Teaching self-regulated learning strategies increased academic motivation and resilience and reduced students' academic problems. Another individual factor affecting academic resilience is perceived competence. According to Deci and Ryan , individuals have an inherent need for a sense of competence and effective interaction with the environment and the evaluations of others [20]. Therefore, thinking that you are doing better than others and receiving positive feedback for performance can increase one's perceived competence. According to Bandura, people with high self-efficacy deal effectively with threatening situations and approach them with calmness. Bandura's self-efficacy is similar in concept to Harter's perceived competence which refers to people's judgments about their abilities [21, 22]. Harter's competence motivation model explains how perceived competence affects academic resilience [22]. Emphasis on these efforts, on the other hand, forms a system of self-reward in learners, which is the intrinsic motivation. It is independent and evaluates its performance based on internal criteria and independent of the teacher. In this case, the learner does not stop trying until he achieves the desired goals, that is, he/she becomes resilient [23].

Regarding the importance and impact of academic self-efficacy beliefs, Bandura believes that none of the cognitive beliefs of individuals are as essential as academic self-efficacy in managing individual adaptive functions in dealing with stressful problems and situations [24]. Deci and Ryan consider competency as the need to be effective in interacting with the environment, which indicates pursuing the optimal challenges and mastering them using their talents and skills [25]. In this regard, self-regulatory strategies arise from the theory of constructivism and this theory emphasizes the inclusive active role in learning, and this activism and having the right to choose are the factors that have been proposed by Schechty [26] as factors affecting academic self-efficacy. According to the theory of Pintrich [27] and the result of studies by Zimmerman and Martinez Ponce [28], self-regulated students are better academically than other students and can better engage with their academic needs. Schunk's research on self-regulation education and goal setting and the role of students, showed that self-regulation has the ability to promote self-efficacy and can be used as an academic skill and a type of training that can lead to academic self-

efficacy and subsequent increase in academic achievement [29].

Since self-regulation is a process in which individuals play an active role in activities, controls and barriers, and adaptation of behavior. Therefore, it can be concluded that self-regulated learning facilitates resilience by controlling learning and creating self-confidence. Therefore, it is one of the protective factors that plays an important role in overcoming difficulties. Through resilience, the educational process can be facilitated even in difficult and challenging situations and prevent academic failure and boredom. Accordingly, to expand the previous results and to achieve a more comprehensive view of greater academic success, we need more studies on the factors affecting academic resilience.

Therefore, we aimed to determine the relationships between self-regulation and resilience with the mediating role of perceived competence in a causal model.

Method

The present study is a descriptive-correlational study using causal relationship modeling methods. The statistical population of this study was all undergraduate students of public universities in Tehran (Tehran, Allameh Tabatabai, Alzahra, Shahid Beheshti, Science and Technology, Shahid Rajaei Teacher Training Universities) who were studying in the second semester of the academic year of 2018-2019.

Sampling was done using random cluster sampling, so that the sampling unit was the classrooms instead of people. The sample size was calculated based on Kline's method [30] (number of variables multiplied by 40 or number of items multiplied by five if the samples are over 200). We assessed three variables in this study: self-regulation, perceived competence, and resilience. Therefore, the least number of samples must have been 200. However, for better fit indices we selected 370 participants, of which 10 had not completed the whole questionnaire and were excluded, and the information of 360 participants were analyzed.

The following tools were used in this study:

Perceived Competence Scale: This scale was developed by Williams and Desi [31] and is part of a set of scales based on the theory of self-determination developed. This tool has been translated and validated by Mirzaei [34]. This scale consists of four news items that express the learner's sense of adequacy and ability in that subject. The participants answer questions on a seven-point Likert scale from 1 (completely incorrect) to 7 (completely correct). Exploratory and confirmatory factor analysis was used to determine the reliability and validity of the tool. Internal consistency was 0.916 using the Cronbach's alpha method, which indicates the appropriate validity and reliability of this tool.

Self-regulation Scale: This questionnaire contains 14 questions that was designed by Bouffard et al. and standardized by Kadivar [35]. The overall reliability coefficient of the questionnaire based on Cronbach's Figure 1: The experimental model of the effect of self-regulation on academic resilience mediated by perceived competence alpha was 0.71. The reliability of the cognitive strategies' subscale was 0.70 and the metacognitive subscale was 0.68. In this questionnaire, questions 3, 6, 9, 10, 13 are related to the metacognitive component of self-regulation and questions 14, 12, 11, 8, 7, 5, 4, 2, 1 are related to the cognitive component. To determine its structure, the results of factor analysis showed that the correlation coefficient between the questions was appropriate and the measurement tool consisted of two factors. The value load related to the factors was acceptable and this tool was able to determine the self-regulatory variance by 0.52. The validity of the construct was desirable [35]. In this questionnaire, five options are considered for each item (strongly agree, agree, have no opinion, disagree and strongly disagree) scored from 5 to 1, respectively. Questions 5, 13 and 14 are reversely scored.

Academic Resilience Scale: This scale was devised by Martin to measure the learners' academic resilience in facing barriers, challenges, and pressure in academic settings [33]. This scale has only one dimension and consists of six items rated on a Likert scale from 1 (completely disagree) to 7 (completely agree). The questionnaire was validated for the first time in Iran by Hashemi [36]. In this study, exploratory factor analysis and internal consistency methods were used to check the validity and reliability of the scale. Factor analysis identified one factor. This factor predicted 56.655% of the total variance of resilience. Also, the internal consistency coefficient was 0.845.

We used path analysis in this study which is a comprehensive method for multivariate analysis. The AMOS and SPSS software, version 22 were used for analysis.

Results

Figure 1 shows the experimental model of the effect of self-regulation on academic resilience mediated by perceived competence.

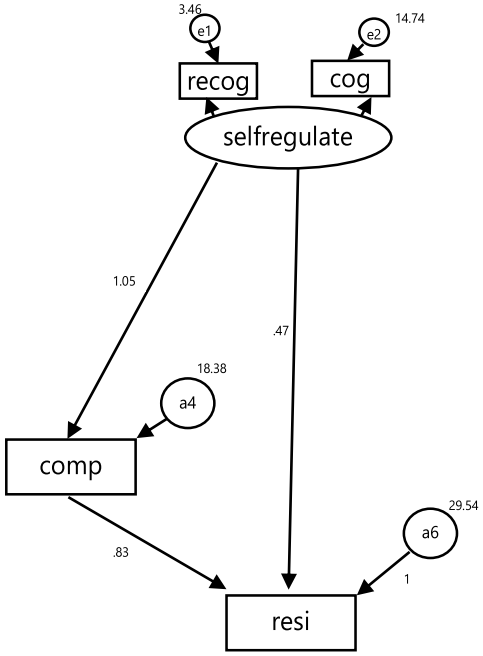

Figure 1. The experimental model of the effect of self-regulation on academic resilience mediated by perceived competence

First, descriptive indices (mean, median, and standard deviation) for the whole sample were examined and reported in Table 1. The calculated mean and standard deviation show that the scores have a good dispersion. The correlation coefficients between the studied variables were calculated and presented as a correlation matrix in Table 2. All correlations were significant at the level of P<0.01.

To predict academic resilience, the proposed conceptual model was examined through causal modeling and the most likely method for estimating the model was Chi-square index (x), Chi-square index on degree of freedom (x), Comparative Fitness Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness Fit Index (AGFI) and Root Mean Square Approximation Error (RMSEA) were used to fit the patterns.

According to the results of Table 3, the statistics related to model fitness, it is observed that the RMSEA was less than 0.05 and the GFI and AGFI have values of one. These values indicate good agreement of the pattern with the observed data. After confirming the measurement patterns of latent variables, the structural function model (Table 4) was fitted to the data.

We found that the studied variables had a direct effect on resilience. Examining the overall effect, it was found that self-regulation had a positive and significant effect on academic resilience as well as perceived competence. Perceived competence had no indirect effect on resilience, self-regulation had an indirect and positive effect on resilience, and self-regulation had no indirect relationship with perceived competence. Therefore, the study of direct effects showed that there was a significant relationship between the independent variable and the mediator with the dependent variable.

As shown in Table 5, the model can be expanded by self-regulation and autonomous motivation. This means that other exogenous variables can also affect the model.

Table 1. Descriptive Indices of the Effect of Perceived Competence on Academic Resilience

Variables	Mean	SD	Variance
Cognition	31.95	5.37	28.92
Metacognition	18.81	2.93	8.58
Perceived Competence	22.67	4.90	24.55
Academic Resilience	14	29.22	7.16

Table 2. Correlation Matrix of the Effect of Self-regulation on Academic Resilience

Variables	Cognition	Metacognition	Perceived Competence	Academic Resilience
Cognition	1			
Metacognition	0.54	1		
Perceived Competence	0.33	0.37	1	
Academic Resilience	0.29	0.32	0.63	1

Table 3. Model Fit Indices

CFI	DF	χ2	RMSEA	AGFI	GFI
1.000	1	.003	.0001	1.00	1.00

Table 4. Tested Paths in the Structural Equation Model (measured and standard parameters)

Paths	Direct Effects	Indirect Effects	Total Effects
From self-regulation to academic resilience	472 (.14)	.866 (.27)	1.33 (.42)
From perceived competence to academic resilience	0.82 (.56)	.0001 (.0001)	0.82 (.56)
From self-regulation to perceived competence	1.04 (.48)	.0001 (.0001)	1.04(.48)

P<0.01, P<0.05

Table 5. Amount of Error from Measuring Each Construct

Error from measuring each construct	Measured Amount	SD	t	P
Latent resilience construct	29.54	2.24	13.18	P<0.01
Perceived competence	18.38	1.56	11.77	P<0.01

Discussion

The results indicated that self-regulation had a direct, positive and significant effect on resilience. This means that enhancing the learners' self-regulation skills can improve their resilience. Resilience is considered as a person's positive adaptation in response to adverse conditions. In the theory of attribution and control, resilience is one of the protective factors which plays an important role in the success of people and surviving through adverse situations, so that having this feature makes students behave adaptively in problem solving situations and makes it easier for them to face problems [37].

Self-regulation has valuable results in the learning and training process as self-regulation is the active engagement in the environment. Such learners plan and monitor their learning and believe that the key to their success and progress depends on trying and using strategies that are under their control, in other words, they will feel in control of their educational status [10]. When learners control their learning, they gain a deeper insight into how they learn and what works best for them, and this ultimately helps them perform their tasks at a higher

level. Accordingly, due to the feeling of mastery of the situation and also their belief in achieving success, they will try harder and do not give up easily. Therefore, mastering the content of learning will lead to more progress and success. Those who face difficult situations do not give up and will be able to control the situation and successfully control difficulties, which in turn has led to more success and self-confidence, which is one of the most important components in resilience. Also, Kaushik and Jena have stated that enhancing the self- regulation skill in students with learning difficulty empowers the ability to understand and control their learning which is very important for success [38]. Therefore, controlling the situation and self-confidence and perseverance ultimately lead to resilience.

Self-regulated learning has been assessed in several studies whose results are consistent with our study indicating a direct and significant relationship between self-regulated learning and resilience [13, 19, 39].

The findings of this research showed that self-regulation is related to resilience. Also, as the relationship between the total self-regulation variable and resilience was greater than its direct relationship with resilience, the possibility of the mediating variable of perceived competence is not ruled out. The relationships show that the perceived competence (as a mediating variable) affects the relationship between self-regulation and resilience and enhances this relationship. The results of this study are consistent with previous research. The results of the study of Mokhberi et al. showed that teaching motivational self- regulation strategies (MSRSs) had a significant positive effect on students' academic self- efficacy [40]. Bandura states that self-regulation is actually an internal controller that determines what to do, so that people are constantly setting goals for themselves and then comparing their position to their goal and standard. A person's standards can motivate him to work harder or change his/her behavior to achieve a specific goal or standard. In this regard, Martin and Marsh state that self-efficacy is an important predictor of academic resilience and its cultivation restores learning and thus promotes opportunities for success [41]. Studies have proven that paying attention to and promoting students' beliefs about themselves and their academic capacity and developing effective goal-setting skills guarantees their success and becomes a basis for improving their self-efficacy [41-43]. He states that working on self-regulation and goal setting improves students' planning and competence, which are the two main keys to student resilience. Emphasis on developing students' self-regulatory skills is an important factor in enhancing their capacity for planning, study management, and persistence in challenging situations [18]. When students understand a relationship between their effort and strategies and their academic results, they feel more in control of their ability to achieve and repeat success or avoid failure. Therefore, people's mastery in learning and controlling the learning situation reduces the anxiety or fear of failure in them. Effort and commitment and using appropriate strategies with the learning situation along with no fear of failure leads to problem solving and overcoming difficulties and promotes their self-efficacy. According to Masten, this encourages students' sense of self-confidence and academic self-efficacy to engage with developmental tasks, current unfavorable conditions, and future challenges [44]. Thus, students with high self-efficacy are more confident in their abilities to succeed, and according to Bandura who acknowledges that none of individuals' cognitive beliefs are as effective as academic self-efficacy in managing individual adaptive functions in dealing with problems and stressful conditions, facilitates their passage through difficult conditions and eventually leads to resilience [24].

Conclusion

Since researchers consider resilience to be a person's positive adaptation in response to adverse conditions; it is one of the protective factors that plays an important role in overcoming difficulties. Through resilience, the educational process can be facilitated even in difficult and challenging situations and prevent academic failure and boredom. Self-regulatory variable as an exogenous variable has a direct effect on resilience and also affects resilience through the mediating variable of competency perception. Therefore, it is suggested that other factors such as learners' goal orientation, self-fulfillment, self-esteem, learners' perception of the classroom atmosphere be studied on the model.

Conflict of Interest

All authors declare that they have no conflicts of interest.

Ethical Approval

All ethical principles were considered in this article. The participants were informed about the purpose of the research. They were also assured about the confidentiality of their information..

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