INDIVIDUAL INNOVATIVENESS AND LEADERSHIP SELF-EFFICACY AMONG THE TEACHER CANDIDATES: THE MEDIATING ROLE OF SELF-REGULATION APPROACH

INOVAÇÃO INDIVIDUAL E AUTOEFICÁCIA DE LIDERANÇA ENTRE OS CANDIDATOS A DOCENTE: O PAPEL DE MEDIAÇÃO DA ABORDAGEM DE AUTORREGULAÇÃO

INNOVACIÓN INDIVIDUAL Y AUTOEFICACIA DE LIDERAZGO ENTRE LOS CANDIDATOS A MAESTROS: EL PAPEL MEDIADOR DEL ENFOQUE DE AUTORREGULACIÓN

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ABSTRACT: A limited number of studies have assessed the relation between individual innovativeness and leadership self-efficacy among the teacher candidates. This research investigated the mediating effects of Self-Regulation Approach, to determine the direct and indirect relationships between teacher candidates' individual innovativeness and leadership self-efficacy. Participants (between 17 and 24 years old) at a university (N=350) participated in this study, 68.9% (241) of the participants were female, 31.1% (109) were male. The correlational survey model was used. Instrument of the study was comprised of four sections: (i) Personal Information Form containing demographic variables, (ii) Individual Innovativeness Scale (IIS), (iii) Leadership Self-Efficacy Scale (LSES) and (iv) Self-Assessment Approach Scale (SAAS). The results show that regression analysis was used to test the hypotheses, and leadership self-efficacy scale was defined as dependent, individual innovativeness as independent, self-assessment approach as mediator, and gender and grade level as control variables.

KEYWORDS: Teacher candidates. Self-regulation approach. Leadership self-efficacy.

RESUMO: *Um número limitado de estudos avaliou a relação entre inovação individual e autoeficácia de liderança entre os candidatos a professores. Esta pesquisa investigou os efeitos mediadores da Abordagem de Autorregulação, para determinar as relações diretas e indiretas entre a inovação individual de candidatos a professores e a autoeficácia de liderança. Participantes (entre 17 e 24 anos - N=350) de uma universidade participaram deste estudo, 68,9% (241) dos participantes eram do sexo feminino, 31,1% (109) eram do sexo masculino. Foi utilizado o modelo de pesquisa correlacional. O instrumento do estudo foi composto por quatro seções: (i) Formulário de Informações Pessoais contendo variáveis demográficas, (ii) Escala de Inovação Individual (IIS), (iii) Escala de Autoeficácia de Liderança (LSES) e (iv) Escala de Abordagem de Autoavaliação (SAA). Os resultados*

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mostram que a análise de regressão foi usada para testar as hipóteses, e a escala de autoeficácia de liderança foi definida como dependente, inovação individual como independente, abordagem de autoavaliação como mediadora e gênero e série como variáveis de controle.

***PALVRAS-CHAVE**: Candidatos a professores. Abordagem de autorregulação. Autoeficácia da liderança.*

***RESUMEN**: Un número limitado de estudios ha evaluado la relación entre la innovación individual y la autoeficacia de liderazgo entre los candidatos a docentes. Esta investigación investigó los efectos mediadores del Enfoque de Autorregulación, para determinar las relaciones directas e indirectas entre la innovación individual de los candidatos a docentes y la autoeficacia de liderazgo. Los participantes (entre 17 y 24 años) en una universidad (N=350) participaron en este estudio, el 68,9% (241) de los participantes eran mujeres, el 31,1% (109) eran hombres. Se utilizó el modelo de encuesta correlacional. El instrumento del estudio estuvo compuesto por cuatro secciones: (i) Formulario de información personal que contiene variables demográficas, (ii) Escala de innovación individual (IIS), (iii) Escala de autoeficacia de liderazgo (LSES) y (iv) Escala de enfoque de autoevaluación (SAAS). Los resultados muestran que se utilizó el análisis de regresión para probar las hipótesis, y la escala de autoeficacia de liderazgo se definió como dependiente, la innovación individual como independiente, el enfoque de autoevaluación como mediador y el género y el grado como variables de control.*

***PALABRAS CLAVE**: Candidatos a maestros. Enfoque de autorregulación. Autoeficacia del liderazgo.*

Introduction

Social change and developments affect all areas of life, including individuals, so teachers who educate the society should also update their teaching skills within the scope of this change and development. They must have an understanding of innovation that will adapt to emerging innovations, while developing the leadership capacity of teacher candidates.

Self-regulation approach as mediator

Successful learners are those who self-regulate learning by using learning strategies to secure task completion (BEMBENUTTY, 2006). They also control their behavior not only to perform or plan valuable academic tasks, but also to maintain motivation by eliminating distractions. Self-regulation of learning, a process that requires learners to participate actively, is students' personal, behavioral, motivational, and cognitive learning efforts to achieve important and valuable academic goals (ZIMMERMAN, 1998). Self-regulation first came to

the fore with Bandura's (1991) social-cognitive theory. According to him, human Behaviors are motivated and regulated by an internal effect of their own accord, in line with the experiences they have acquired and will acquire. Self-regulation, which was gained importance with Bandura's (1991) social-cognitive theory, can be defined as human behaviors are motivated and regulated by spontaneous intrinsic influences in the direction of experiences to be gained and experienced (ÇOLAKOĞLU; MAHIROĞLU, 2019).

According to Kuhl (1985), the realization of any deliberate action that takes place under certain conditions orientation between the current psychological state and the new psychological state that occurs after the action depends on the process. According to him, this process occurs in two different ways: action-oriented and situation-oriented. Action-oriented orientation, also known as self-regulation, is essentially one's own emotion, while it is defined with the capacity to regulate thoughts and behaviors, situational orientation is the individual's ability to pursue the same goal. It is related to the inability to regulate one's own feelings, thoughts and behaviors in order to achieve.

Leadership self-efficacy

Self-efficacy is the point of view that a person must have unique characteristics and abilities in order to fulfill the responsibilities required for a task, and also, self-efficacy is both a vision and a situational condition (BANDURA; ADAMS, 1997). It is known that leadership self-efficacy has the ability to predict leadership behavior and distinguish it from those who are leaders and those who are not (MCCORMICK; TANGUMA; LÓPEZ-FORMENT, 2002). This means that, taken in line with the meaning of the word leadership, it can support the more general leadership competence in which it can perform leadership operations and specific managerial tasks (CANNONIER; KATSIOLOUDES, 2020). Leadership competence and effectiveness are associated with academic, social and career functions critical to leadership. Leadership self-efficacy is the definition of teachers to use resources and skills effectively in the classroom and to lead them effectively (CHEMERS; WATSON; MAY, 2000; NGUYEN, 2017).

Individual innovation

Innovation is a new and valuable idea or information, the right place. and by embodying it in time, to a product or process useful to society is to convert (LUECKE; PATTERSON, 2008). Innovation is a Latin word. It is derived from the root "*innovare*" and means a new, different product or it means generating ideas (YAMAÇ, 2001). The concept of innovation, which includes the delivery of products and services resulting from the needs of individuals makes it well presented (ERTUĞ; KAYA, 2017).

The aim of this study was to present the role of self-regulation approach in the relationship between teacher candidates' individual innovativeness and leadership self-efficacy. Within the scope of this general purpose, the answers to the following questions in the research searched.

1. What is the level of individual innovativeness and leadership self-efficacy of teacher candidates?
2. Does self-regulation approach characteristics of teacher candidates, differ according to their individual innovativeness?
3. Does self-regulation approach characteristics of teacher candidates, differ according to their leadership self-efficacy?

Methodology

The study design and sample

In this study, which aims to determine the direct and indirect relationships between teacher candidates' individual innovativeness, self-regulation approach and leadership self-efficacy, the correlational survey model was used. Correlational survey model is a survey model that aims to determine the existence of co-change between two or more variables (KARASAR, 2014). In this context the theoretical model in Figure 1. has been tested. The study was carried out with 350 teacher candidates studying at Artvin Çoruh University, Faculty of Education. The sample determined by the convenience sampling method. While 68.9% (241) of the participants were female, 31.1% (109) were male. In the sample group, 17.7% (62) were first grade, 34.0% (119) were second grade, 21.4% (75) were third grade, and 26.9% (94) were fourth grade students.

Instruments

The questionnaire is comprised of four sections: (i) Personal Information Form containing demographic variables, (ii) Individual Innovativeness Scale (IIS), (iii) Leadership Self-Efficacy Scale (LSES) and (iv) Self-Assessment Approach Scale (SAAS). Personal Information Form: The personal information form consists of two questions asking the gender and grade levels of the participants. These two variables in the personal information form were used as control variables. Individual Innovativeness Scale (IIS): Its original form was developed by Hurt, Joseph and Cook (1977) as the “Innovativeness Scale” and adapted into Turkish by Kılıçer and Odabaşı (2010). It consists of 20 items. It is a five-point Likert type scale such as "strongly agree (5) and "strongly disagree (1)". In the adaptation study of the scale into Turkish, validity and reliability studies were carried out. As a result of the analyzes made, it was concluded that the scale is valid and reliable. In this study, the internal consistency coefficient (Cronbach's Alpha) of the scale was found to be 0.92.

Leadership Self-Efficacy Scale (LSES): Its original form was developed by Bobbio and Manganelli (2009) and adapted into Turkish by Cansoy and Polatcan (2018). It consists of 19 items. It is a five-point Likert type scale such as "strongly agree (5)” and "strongly disagree (1)". In the adaptation study of the scale into Turkish, validity and reliability studies were carried out. As a result of the analyzes made, it was concluded that the scale is valid and reliable. In this study, the internal consistency coefficient (Cronbach's Alpha) of the scale was found to be 0.96.

Self-Assessment Approach Scale (SAAS): Its original form was developed by Kruglanski *et al*. (2019). It consists of 8 items. It is a five-point Likert type scale such as "strongly agree (5)” and "strongly disagree (1)". In the adaptation study of the scale into Turkish, validity and reliability studies were carried out. As a result of the analyzes made, it was concluded that the scale is valid and reliable. In this study, the internal consistency coefficient (Cronbach's Alpha) of the scale was found to be 0.84.

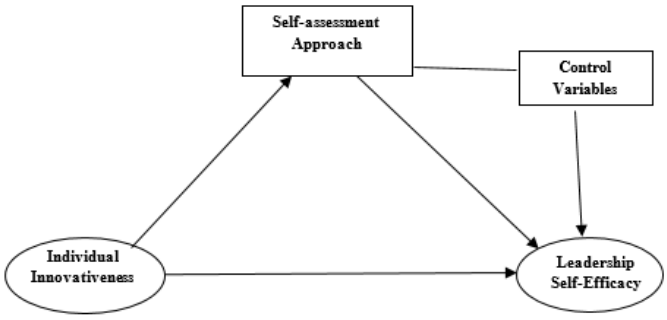
Procedure

The scales were sent online to teacher candidates. 372 scales were filled in, but 22 of them were deleted from the data set in the assumption analysis. As a result, 350 scales were analyzed.

Data analysis

The data were organized in MS Excel and then transferred to the SPSS statistical program. IBM SPSS 25 and PROCESS macro plug-in were used to analyze the data. The demographic characteristics of the participants were analyzed using descriptive statistics. The means and standard deviations of the variables were determined by descriptive statistics. Correlation analysis was performed to determine the relationships between variables. Factor analysis of each scale was performed to ensure construct validity. Multiple regression analysis was used to test the hypotheses, and leadership self-efficacy scale was defined as dependent, individual innovativeness as independent, self-assessment approach as mediator, and gender and grade level as control variables. The PROCESS macro plug-in was used to test the mediation hypotheses (HAYES, 2018; DAWSON, 2020).

Figure 1 - Theoretical Model of The Research (PROCESS macro, model 4)



Source: Devised by the authors

Figure 1 illustrates the theoretical model of the study. The model used in the research is PROCESS macro model 4. According to this model it was assumed that there is a correlation between individual innovativeness and leadership self-efficacy (H1), and self-assessment approach and leadership self-efficacy (H2). In addition, an association was estimated between individual innovativeness and self-assessment approach (H3). Moreover, self-assessment approach was designed as the mediator variable in the effect of individual innovativeness (independent variable) on leadership self-efficacy (dependent variable) (H4). Gender and grade level were used as control variables in the model.

Results

Before the regression analysis, the means and standard deviations of the variables and the correlations between these variables were examined. As a result of the first analysis, correlations of variables with each other, means and standard deviations are presented in Table 1.

Table 1 - Means, Standard Deviations and Correlations of the Variables

	Variables	M	sd	1	2	3
1	Individual Innovativeness	67.91	13.02	1	.558*	.639*
2	Self-Assessment Approach	25.81	6.09		1	.428*
3	Leadership Self-Efficacy	73.32	14.17			1

*p<.01
Source: Devised by the authors

As seen in table 1, teacher candidates' individual innovativeness levels M = 67.91, self-assessment approach levels M = 25.81 and leadership self-efficacy levels M = 73.32. There are moderate, positive and significant relationships between teacher candidates' individual innovativeness, self-assessment approach and leadership self-efficacy levels (r =.558, r =.639, r =.428 p <.01). Accordingly, the H_1, H_2 and H_3 hypotheses were accepted.

Table 2 – Main Effects on SA and LSE

Variable	Model 1 (SA)			Model 2 (LSE)			Model 3 (LSE)		
	B	SE	p	B	SE	p	B	SE	p
(Constant)	1.015	0.228	< .001	1.504	0.208	< .001	1.402	0.212	< .001
II	0.660	0.052	< .001	0.731	0.048	< .001	0.665	0.057	< .001
Gender	0.065	0.074	0.380	-0.047	0.067	0.485	-0.053	0.067	-0.799
Grade level	-0.044	0.032	0.165	-0.026	0.029	0.370	-0.022	0.029	0.457
OD							0.101	0.049	0.039
F		53.412			80.380			61.928	
p		<.001			<.001			<.001	
R^2		0.317			0.411			0.418	

II= Individual Innovativeness, SA= Self-Assessment, LSE= Leadership Self-Efficacy
Source: Devised by the authors

The effects of the dependent variables on the independent variables are given in Table 2. In Model 1, the effect of individual innovativeness on self-evaluation was analyzed. Accordingly, the effect of individual innovativeness on self-evaluation was positive (B= 0.660, p<.001). While the effect of gender on self-evaluation was positive (B= 0.065, p>.05), the effect of class level was negative (B=-0.044, p>.05). The effect of individual innovativeness on leadership self-efficacy is demonstrated by Model 2. Individual innovativeness had a positive (B= 0.731, p<.000) effect on leadership self-efficacy. In Model

2, it was found that gender and class level did not have a significant effect on leadership self-efficacy. In Model 3, the effect of individual innovativeness and self-evaluation on leadership self-efficacy was analyzed. While individual innovativeness affects leadership self-efficacy positively (B= 0.665, p<.001), self-assessment also affects positively (B=0.101, p<.001). It was understood that age and grade level did not have significant effects on leadership self-efficacy.

Table 3 – Total, Direct, and Indirect Regression Analysis on LSE

Total Effect of II on LSE			Unstand.	SE	LLCI	ULCI
			0.731	0,048	0.638	0.825
Direct Effect of II on LSE			Unstand.	SE	LLCI	ULCI
			0.665	0.057	0.552	0.777
Indirect Effect on LSE						
Independent	Mediator	Dependent	Unstand.	SE	LLCI	ULCI
II	> SA	> LSE	0.067	0.035	-0.002	0.137

Source: Devised by the authors

In order to determine the necessary relationships for the mediation analysis, firstly, direct regression analyzes were performed between the variables and are shown in Table 2. According to Model 1, the effect of individual innovativeness on the mediating variable, self-evaluation, was significant. The effect of individual innovativeness on leadership self-efficacy was significant (Model 2). The effects of individual innovativeness and self-evaluation on leadership self-efficacy were found to be significant (Model 3). Therefore, the necessary significant relationships have been determined for a mediating effect.

The lower and upper limits of the 95% bias corrected confidence intervals are given in Table 3. If zero falls between these confidence intervals, the indirect effect is likely to be zero. In other words, the mediation effect will not be statistically significant in this case (PREACHER; HAYES, 2008). In the study, indirect effects were evaluated in the 95% confidence interval and data were obtained by repeating the bootstrap random sample observations 1000 times. Warner (2013) stated that the mediator variable is statistically significant if the lower and upper limit values of the bias do not include zero values within the 95% confidence interval. In this context, the overall indirect effect is not statistically significant since the lower limit value is -0.002 and the upper limit value is 0.137 and zero is between the lower and upper limits of these confidence intervals. Accordingly, as can be seen from Table 3 showing the mediation analysis, the mediation effect of self-assessment was not statistically significant. The H_4 hypothesis was not accepted.

Discussion and Conclusion

For adapting new era educational changings pre-service teachers should develop their classroom management potential in accordance with 21st century values. For this purpose, the present study is to determine the role of self-regulation approach in the relationship between teacher candidates' individual innovativeness and leadership self-efficacy. Based on the findings obtained, the following results were reached and discussed.

According to the first finding of the research, individual innovativeness and leadership self-efficacy levels of teacher candidates in Model 1, the effects of individual innovativeness, which is the independent variable, on the mediator variable, self-evaluation, were analyzed. Accordingly, the effect of individual innovativeness on self-evaluation is positive (B= 0.660, p<0.001) and significant. It would lend itself well to pre-service teachers should have individual innovativeness for having a self-regulated perspective to become effective teachers in class. Likewise, Eekelen, Boshuızen and Vermunt (2005) assumed that learning experiences of teachers should be planned, reflective, or self-organized. At times, teachers' learning was either planned (self-regulated), although mostly non-linear (both extrinsically and self-regulated) or spontaneous (externally regulated). They conclude that teacher candidates they often self-regulate their teaching practices (along with learning as a result), yet they do not always self-regulate their learning (which may contribute pre-service teachers to have that perspective). Moreover, including enhancing their students' motivation, grading student work, maintaining effective classroom management, enactment of goals, require intense task-focus, and preparing lesson plans are those accepted as the multiple tasks that teachers have. Self-regulation is an essential determinant which studies examining teachers' effectiveness, suggest that teachers' efficacy (DEMBO, 2001; RANDI, 2004; BEMBENUTTY, 2009). It is found in some other studies not only there is a positive correlation was found between students' individual innovativeness (ADIGÜZEL, 2012) but also, the self-efficacy perceptions of student teachers the resistance to innovation among student teacher respondents varied across subcategories which included motivation, instructional skills and guidance (ÇELIK, 2013).

Another key point in this research in this study, prospective teachers' qualities for an effective classroom management which is related their individual innovativeness since it is now an obligatory for teachers to overcome issues with their students. Accordingly, it is found in this research that most teachers in the early category have high scores for pedagogical web content and general web knowledge, and that "individual innovativeness" to which they

belonged to communicative web categories was effective in predicting the general web (GÖKÇEARSLAN; KARADEMIR; KORUCU, 2017). Also, in Bubou and Job (2020) research they also had a similar finding such as there is a strong positive and significant relationship in first- and second-year students of the Yenagoa Study Centre of the National Open University of Nigeria (NOUN) for individual innovativeness.

The second important finding in this research which the characteristics of pre-service teachers' self-regulation approach differ according to their individual innovativeness, In Model 2, the effect of individual innovativeness on leadership self-efficacy, which is the dependent variable, was analyzed. It is reached that individual innovativeness has a positive (B= 0.731, p<0.000) and significant effect on leadership self-efficacy. As anticipated, for strong leadership, it is crucial to feel the self-efficacy of the teachers. Similarly, Nguyen (2017) and Paglis (2010) mentioned that several studies have shown that for assuming a leadership role and becoming a better leader in class, self-efficacy in leadership aids our understanding of the decisions and behaviors associated with.

Seeking help and garnering resources as necessary for self-regulated students who enable them to persist at challenging assignments are typically described as having “good work habits” (RANDI; CORNO; JOHNSON, 2011). Another fact to remember is that there is a cognitive constructivist explanation of self-regulated learning from different theoretical perspectives. While a constructivist account is a theory of what students know and are capable of doing in the classroom, meanwhile, enhancing academic performance and adapting to school are self-regulated learning within this account is concerned with (PARIS; BYRNES, 1989). Furthermore, as a result of Altın’s (2020) research; it has been determined that the experiences of pre-service teachers from their teaching practices, the feedback they receive, self-regulation, peer evaluation and video recordings positively affect the reflective thinking skills of pre-service teachers so it may be assumed that providing self-regulation experiences like mentioned above for teacher candidates would affect the leadership self-efficacy.

The third finding of this research is teacher candidates' self-regulation approach characteristics differ according to their leadership self-efficacy in which can be seen in model 3, and the effect of individual innovativeness and self-evaluation on leadership self-efficacy was analyzed. Individual innovativeness has a positive (B= 0.665, p<0.001) and it is significant, moreover, self-evaluation is positive (B=0.101. p<0.001) and has significant effect on leadership self-efficacy. Therefore, the necessary significant relationships have been determined for a mediating effect. This finding shows that teachers should have a self-regulatory perspective on their teaching skills, because we believe that this perspective is

directly related to classroom effectiveness and leadership skills. Likewise, Hill, Ell, and Eyers (2017) emphasized that pre-service teachers have a positive perspective on including students in their own assessment, they know that self- and peer-assessment helps students become self-regulated learners, and that the process of assessment should be shared with students rather than solely the responsibility of the teacher. As a matter of fact, pre-service teachers reported that they learned to encourage students to be self-directed autonomous learners in at least three of the courses and courses they took at their universities. Hence, it can be indicated that in programs of education faculties there should be courses supporting individual innovativeness and self-regulation skills for teacher candidates for providing leadership efficacy of them. Moreover, Arlı and Avcı (2017) also reached a finding alike, in their study conducted with primary school teachers, correlation findings revealed that self-leadership was in a significant and same-sided relationship with self-evaluation, and regression analysis findings revealed that self-evaluation had a significant and positive effect on self-leadership behaviors. In short, pre-service teachers can engage in self-regulated learning both as teachers in their classrooms and as students in university classrooms. Aslanoğlu (2016), Yurdabakan (2016), Koçyiğit, Erdem and Eğmir (2020), also mentioned self-regulation approach characteristics differ according to pre-service teachers' leadership self-efficacy through peer and self-assessment approaches also play an important role in teacher training programs because one of the important goals of educational sciences and teacher training programs is to teach prospective teachers to evaluate. It is thought that peer-self-assessment improves the academic performance of pre-service teachers and can positively affect their professional lives by gaining assessment experience. Interestingly, McCormick (2001) and Machida and John Schaubroeck (2011) stated that increasing teachers' leadership self-efficacy should be an important goal for those who, as teachers, are responsible for improving the quality of leadership in the classroom.

Contrary to the expectations, the mediation effect of self-assessment between individual innovativeness and leadership self-efficacy was not statistically significant. This finding seems to contradict the findings of Köstereliođlu and Çelen (2016) because they underlined in their research that they found that pre-service teachers had a positive attitude towards the use of self-assessment method at the end of the application. All these results support the research hypotheses that the effect of individual innovativeness on self-evaluation is positive, individual innovativeness has a positive and significant effect on leadership self-efficacy, individual innovativeness is positive and significant, and self-evaluation leadership has a significant effect.

Since the research was carried out with a limited study group consisting of first-year teacher candidates attending a state university in Artvin, there are some limitations of working with a larger study group in order to generalize the research results. In the future, it is desired to increase the number of teachers and teacher candidates participating in the research and to include participants from other departments. Another limitation of the research is that the participants focus on self-regulation approach, individual innovativeness and leadership self-efficacy.

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