ACJES
Academy Journal of Educational Sciences

Volume:6/Issue:2/2022

ACADEMY JOURNAL OF EDUCATIONAL SCIENCES
INTERNATIONAL PEER REVIEWED E-JOURNAL

E-ISSN: 2602-3342

Publication Frequency
Biannually

Publication Type
Periodical

Publication Languages
Turkish and English

Graphic Design
Lec. Erdoğan Dizdar

Web Design
Lec. Vedat Şeker

Language Control
Res. Assist. Ömer Yılmaz
Res. Assist. Seren Özgür
Res. Assist. Zeynep Önder

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EDITORIAL

Dear researchers,

We are happy to share the eleventh issue of Academy Journal of Educational Sciences (ACJES) with you. We would like to thank the members of the editorial board, advisors, writers and referees who have contributed to the publication of ACJES.

Hope to see you again in the next issues...

On behalf of ACJES
Editor
Dr. Sedat TURGUT

Academy Journal of Educational Sciences
November 2022, Volume 6, Issue 2, 69-76

Evaluation of the Outcomes in the 2018 Primary School Visual Arts Curriculum in terms of Creativity*

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Abstract

Visual arts course in basic education provides children with the opportunity to acquire skills with different tools, but also serves to gain an artistic perspective at an early age, develop aesthetic perception and advance creativity.One of the environments that foster creativity in children is undoubtedly the learning environments where basic education takes place.The main purpose of this study is 2018 revised visual arts curriculum (1-4) is the examination of classroom outcomes in terms of creativity. The research is a qualitative study and carried out using the document review. The data source consists of the primary school visual lesson (1-4th grade) curriculum selected through purposeful sampling from the visual arts course (1-8th grade) curriculum revised in 2018. Descriptive analysis was used in the analysis of the data.The results obtained from the research determined that the primary school visual art curriculum is related to the creativity divergent thinking sub-dimension from the total (n=65) outcome (n=25).However, it found that the outcomes related to creativity gathered in the field of "Visual Communication and Formation learning, and the outcomes of the "cultural heritage and art criticism and aesthetics" learning fields are limited.Based on the results, it suggested to increase the number of achievements related to creativity in primary school visual arts course outcomes and distribute them homogeneously in learning areas.

Keywords: Art Education, Creativity, Curriculum, Primary School, Visual Arts Course

About the Article

Type: Research
Received: 6 July 2022
Accepted: 26 September 2022
Published: 30 December 2022
DOI: 10.31805/acjes.1141273
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* A part of this article was presented as an oral presentation at the ISARC 2nd International Hasankeyf Scientific Studies and Innovation Congress between 25-26 June 2022

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Suggested APA Citation

Tantan, M. (2022). Evaluation of the outcomes in the 2018 primary school visual arts curriculum in terms of creativity. *Academy Journal of Educational Sciences, 6*(2), 69-76. http://dx.doi.org/10.31805/acjes.1141273

Introduction

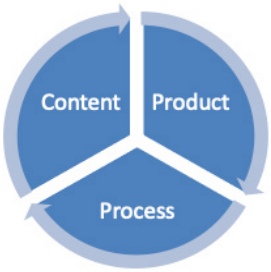
Art is a way of expressing the events that occur in the individual and the society in which he lives in a different way (Hicks, 2004). Dewey (1934) described art as an activity that creates new formations in human consciousness, supports creativity, and creates emotional integrity (cited in Goldblatt, 2006). Art has many functions at the universal level, and these functions distinguish it from other disciplines as well as show that it interacts with other disciplines. As a matter of fact, Caswell (2001) defined art as a "communication protocol" and stated that it is a unifying and healing communication activity that strives to eliminate the differences between people. In this direction, the relationship between art and education is in the form of an intertwined ring. One of the main purposes of art education is to understand and make sense of oneself and others (Anderson, 2003). Art education is not only a process in which children express themselves, but also an education in which they outcomes many competencies. Through art education, children's critical thinking, problem solving, and creative thinking skills, aesthetic perception and empathy skills can be developed (Gibson, 2003). "Creativity" is an important locomotive skill in serving this purpose of art education. Creativity is the state of releasing more than we can imagine. Creativity is realized by the divergent thinking style, which is the product of independent thoughts that do not come sequentially, spread like a spider web, rather than the convergent thinking style in which one of the following thoughts is lost when one is lost (San,

1996). In the 1950s, when creativity was an important factor in art education, it was more clearly seen in visual arts education, which is equivalent to art education. In particular, Viktor Lowenfeld states that teachers should allow children to feel free intellectually and emotionally in the visual arts class, and thus encourage their creativity (San, 1996).

According to Robinson (2018), creativity is linked to culture. Cultural conditions can fuel or kill creativity. Creative thoughts do not flourish in a vacuum. Individual creativity triggers other people's thoughts, work and works. When we look at creativity theories and approaches, we see similar and differentiating aspects (Yaşar & Aral, 2010). Mystical Approach examined artistic creativity only in the field of fine arts. They considered the concept of creativity with a philosophical point of view and believed that creativity could emerge in very difficult situations by considering it with a mystical approach. The psychometric approach, on the other hand, believes that individuals reveal their intuition and imagination powers and creativity. In other words, it means that thinking in different ways, not ordinary, brings creativity to the individual. It is stated that the basis of creative thinking is divergent thinking (Ataman, 1996).

Psychoanalytic theory has considered creativity as an expression of the whole of the emotions, thoughts and actions that exist in the subconscious of the individual. Association Theory states that this approach, which states that thought is formed base on associations, expresses that associations can develop creativity in the solutions of the experiences and events experienced by the person (Runco & Albert, 1990). Guilford's Factorial theory, on the other hand, associated creativity with thinking processes. Guilford's Model consists of stages in terms of Content-Product-Process as shown in Figure 1.

Figure 1. Dimensions of Factorial Theory



As seen in Figure 1, it is stated that the "divergent thinking" process in the "product" part of the factorial theory, which is included in the 3 dimensions of factorial theory, structures creativity.

By Divergent Thinking, many and alternative solutions are produced to the current problem. The learner spends this process with four dimensions: "rationality (fluency), flexibility, originality (original), enrichment". Fluency is when the learner produces too much on the situation; flexibility product diversity; originality or originality, on the other hand, refers to the originality of the product and enrichment refers to adding differences to the product (Sternberg & Grigorenko, 2010). In this way, the learner with the divergent thinking process experiences the creativity process. In literature studies (Yenilmez & Yolcu, 2007; Yeşilyurt, 2020). it has been shown that there is a positive relationship between divergent thinking and creativity.

One of the environments that foster creativity in children is undoubtedly the learning environments where basic education takes place, where they spend most of the day. Transforming these environments into small artistic spaces is possible with the awareness of classroom teachers. A way of creating artistic spaces for primary school teachers, who take on most of the responsibility in basic education; In its narrow scope, he passes the visual arts course, which is expressed as art education in the literature.

The visual arts curriculum (1-4th grade), which was prepared on the base on the basic constructivist approach, aims to provide the following basic skills. 1-4 of the Visual Arts Lesson Curriculum. in general, "how the world of imagination, feelings and thoughts can be expressed through art, the value of the work of art, the change of art in the process and the recognition of the places where they are made; Creating new ideas inspired by Turkish culture and different cultures, using art materials and techniques while reflecting these ideas into practice; realization of learning through play and questioning, examining the motifs on local art products, being sensitive to art and the effect of art works made in the past on today's art (MEB, 2018).

Studies in the literature examining visual arts teaching programs at primary school level (Yurdakal 2019; Batur, 2010; Özcan, 2017; Yılmaz & Bilici, 2016; Pekdağ, 2011; Mamur & Köksal, 2016) are available. In the study of Pekdağ (2011) "Evaluation of Primary Education Visual Arts Curriculum According to Teachers' Views", it was determined that the activities suggested in the program and the assessment and evaluation part were insufficient and the duration of the lesson was not sufficient for the outcomes. Similar findings, Batur (2010) in his study, which examined the Elements of Primary Education Visual Arts Curriculum, similarly found that sufficient time and appropriate space should be provided, and the weekly course hours should be increased to order for the outcomes to be implemented. It has been observed that the number of studies on the primary school visual arts curriculum and creativity is limited.

This study focuses on the evaluation of the visual arts curriculum (grades 1-4) in the context of "creativity", which is one of the most important parts of art education. In this context, it is important for the literature that the findings obtained as a result of this study include a detailed analysis of how the outcomes of the visual arts curriculum address the concept of creativity, how it supports the creativity of children, and that it helps to form ideas for future reforms and studies on visual arts curriculum. considered to contribute. Additionally, this study will be significant and original for primary school visual art curriculum because in the literature there is no study of 2018 primary school visual arts according to creativity. Based on all these considerations, the main purpose of this study is to evaluate the visual arts curriculum (1-4th grade) from the point of view of factorial theory. Based on this main purpose, the sub-objectives of the research are as follows:

1. How is creativity included in the 1st grade outcomes of the visual arts course curriculum?

2. How is creativity included in the 2nd grade outcomes of the visual arts course curriculum?

3. How is creativity included in the 3rd grade outcomes of the visual arts course curriculum?

4. How is creativity included in the 4th grade outcomes of the visual arts course curriculum?

Method

Research Design

The research is examined based on the evaluation of the achievements in the 2018 Visual Arts Curriculum (1-8th

grade) program in terms of creativity. This research; was used a qualitative research design. Qualitative research provides a detailed discussion of the current situation (Karasar, 2012).

Data Source and Data Collection Tools

The data source of the research is the 2018 Visual Arts Curriculum (1-4). The data was collected by document analysis. Document analysis consists of five stages: access to documents, ensuring authenticity, understanding the document, analysis, and use of analysis (Yıldırım & Şimşek, 2011). The data source of the research was accessed from the official website of the Ministry of National Education. In the selection of the data source of the research, from the 2018 Visual Arts Curriculum (1-8th grade) program, 1-4th grades where the classroom teachers are continuing the course. The data source of the research was accessed from the official website of the Ministry of National Education. In the selection of the data source of the research, from the 2018 Visual Arts Curriculum (1-8th grade) program, 1-4th grades where the classroom teachers are continuing the course. Classroom curricula were selected by purposive sampling method. Purposive sampling is the choice of rich situations to detail the research topic (Büyüköztürk et al., 2008). Within the scope of the research, a total of 65 learning outcomes, 15 in the 1st Grade, 17 in the 2nd and 3rd Grades, and 16 in the 4th Grade, were evaluated over the learning fields of Visual Communication and Formation, Cultural Heritage, Art Criticism, and Aesthetics.

Data Analysis

The data of the research were analyzed by descriptive analysis technique. Descriptive analysis consists of the following stages; creating a framework, processing the data in accordance with the framework, defining, and interpreting the findings (Yıldırım & Şimşek, 2011). total (n=65) outcomes at grade levels were analyzed. The outcomes were evaluated over the divergent thinking sub-dimensions of Guilford's Factorialist theory. According to Guilford, the more original the products designed with divergent thinking, the more creative they are (Güven, 1999). The sub-dimensions of divergent thinking used during the evaluation; fluency, flexibility, originality and enrichment. In the first stage, the outcomes were classified according to the learning areas, then the evaluation was made on the sub-dimensions of creativity. Evaluations, acquisition and learning areas were analyzed categorically as sub-dimensions of creativity, separately for each grade level, and presented in tables. In the study, it was determined that the classroom teachers were the executives of the 1st-8th grade primary school visual arts course teaching program. Classroom visual arts course curriculum achievements are included in the evaluation. In this study the reason for choosing The Factorialist Theory, examined the creativity by divergent and convergent thinkings.

Validity and Reliability

Assistance was received from a visual arts lecturer regarding the reliability of this research. For the reliability of the research, Miles and Huberman's (1994) "coder reliability" was used. "Reliability = Consensus / (Agreement + Disagreement)" was used and the agreement rate among the coders was calculated as 88%. Therefore, it can be said that the data analysis of this study is reliable. Originality and enrichment sub-dimensions were discussed between the researcher and the coder. For example, "VA.1.1.9. She/He creates three-dimensional work." was considered by the researcher as designing a new product and was placed in the originality sub-dimension. However, the coder placed this achievement in the sub-dimension of enrichment and originality. As a result of placing all other acquisitions according to the sub-dimensions in this way, the final percentage of agreement between the researcher and the coder was 88%.

Findings

Creativity in the 1st Grade Outcomes of the Visual Arts Course Curriculum

As a result of the analysis of the data obtained, the findings regarding the availability of creativity in the first- grade outcomes of the visual arts course are presented in Table 1.

As seen in Table 1, it is understood that the 2nd , 4th , 8th , 9th and 10th outcomes related to the "Visual Communication and Formation" learning area in the 1st grade outcomes of the Visual Arts curriculum have the quality of supporting creativity. It is seen that the most common originality sub-dimension is among the outcomes. G.1.1.2. is associated with both originality and enrichment sub-dimensions of creativity to encourage the use of different materials, materials and techniques.

However, the outcomes G.1.1.4 and G.1.1.8 are originality; G.1.1.9. the expression "makes three-dimensional work" in the learning outcome is originality and enrichment; G.1.1.10 to use the elements of art; Flexibility, as it requires using different colors, shapes, and forms, is related to the sub-dimensions of fluency and enrichment in terms of providing a large number of combinations while creating a composition. However, it is seen that there are no outcomes related to creativity in the "Cultural Heritage" and "Art Criticism and Aesthetics" learning areas, where all the outcomes that support creativity in the 1st grade belong to the "Visual Communication and Forming" learning area.

Table 1. *Divergent Thinking Sub-Dimensions Regarding Creativity in the 1st Grade Outcomes of the Visual Arts Curriculum*

Outcomes number/outcomes	Learning Area	Divergent Thinking Sub-Dimension
"VA.1.1.2. She/He uses different materials, objects, equipment and techniques in his visual artworks."	Visual Communication and Formatting	Enhancement/Originality
"VA.1.1.4. She/He creates visual art works inspired by themes, topics, ideas, poems, stories."	Visual Communication and Formatting	Originality
"VA.1.1.8. She/He draws by observing the objects and figures around him."	Visual Communication and Formatting	Originality
"VA.1.1.9. She/He creates three-dimensional work."	Visual Communication and Formatting	Authenticity and enrichment
"VA.1.1.10. She/He uses art elements when creating his visual artwork."	Visual Communication and Formatting	Rationality/Flexibility/Enrichment

Creativity in 2nd Grade Oucomes of Visual Arts Course Curriculum

As a result of the analysis of the data obtained, the findings regarding the availability of creativity in the 2nd grade outcomes of the visual arts course are presented in Table 2.

As seen in Table 2, it is understood that the 1st, 3rd, 4th, 7th and 8th outcomes related to the "Visual Communication and Forming" learning area in the 2nd grade outcomes of the Visual Arts curriculum have the quality of supporting creativity. It is seen that the most common sub-dimensions of originality and enrichment are among the outcomes. G.2.1.1. Since the learning outcome leads to find solutions to the problems encountered, it has been associated with both fluency and enrichment sub-dimensions of creativity.

However, G.2.1.3, G.2.1.7. and G.2.1.8 outcomes originality; The learning outcome G.2.1.4 aims to be inspired by different themes. G.1.1.9. Originality and enrichment as the acquisition requires doing three-dimensional work; G.1.1.10 to use the elements of art; flexibility as it requires using different colors, shapes and forms; It is related to the sub-dimensions of fluency, flexibility and enrichment in terms of providing a large number of combinations while creating the composition.

However, it is seen that there are no outcomes related to creativity in the "Cultural Heritage" and "Art Criticism and Aesthetics" learning areas, where all of the outcomes that support creativity in the 2nd grade belong to the "Visual Communication and Formation" learning area.

Creativity in the 3rd Grade Outcomes of the Visual Arts Course Curriculum

As a result of the analysis of the data obtained, the findings regarding the availability of creativity in the 3rd grade outcomes of the visual arts course are presented in Table 3.

Except for the 1st outcome in the Visual Communication and Formation learning area of the 3rd grade Visual Arts Lesson, all the outcomes support creativity. G.3.1.2. outcome originality, G.3.1.4.and G.3.1.6. outcomes originality/ enrichment, G.3.1.7. outcome flexibility/ enrichment G.3.1.3. rationality/ enrichment outcomes, enrichment no. G.3.1.5. G.3.3.4 and G.3.2.3 outcomes serve creativity with its enrichment sub-dimensions.

Table 2. *Divergent Thinking Sub-Dimensions Regarding Creativity in the 2nd Grade Outcomes of the Visual Arts Curriculum*

Outcomes	Learning Area	Divergent Thinking Sub-dimension
"V.2.1.1. He finds various solutions to the problems he encounters while creating his visual artwork."	Visual Communication and Formatting	Fluency/Flexibility
"V.2.1.3. He reflects his dreams in his work."	Visual Communication and Formatting	Originality
"V.2.1.4. It creates visual art work inspired by different written sources, concepts and themes."	Visual Communication and Formatting	Originality/Enrichment
"V.2.1.7. Makes observational drawings to create visual artwork"	Visual Communication and Formatting	Originality
"V.2.1.8. He creates a visual art work based on his daily life"	Visual Communication and Formatting	Originality
"V.2.1.9. It makes three-dimensional work using different materials."	Visual Communication and Formatting	Originality/Enrichment
"V.2.1.10. Uses art elements when creating visual artwork"	Visual Communication and Formatting	Flexibility/Enrichment/Fluency

Table 3. *Divergent Thinking Sub-Dimensions Regarding Creativity in the 3 Rd Grade Outcomes of the Visual Arts Curriculum*

Outcomes	Learning Area	Divergent Thinking Sub-Dimension
"G.3.1.2. uses an expressive approach when creating his visual artwork."	"Visual Communication and Formatting"	Originality
"G.3.1.3. Develops ideas based on current sources while doing visual art work."	"Visual Communication and Formatting"	Fluency/Enrichment
"G.3.1.4. Uses geometric and organic forms in his observational drawings."	"Visual Communication and Formatting"	Originality/Enrichment
"G.3.1.5. Uses the foreground, middle and back-ground in his two-dimensional work."	"Visual Communication and Formatting"	Enrichment
"G.3.1.6. Makes three-dimensional work using different materials by adding, subtracting, applying force from the inside and outside."	"Visual Communication and Formatting"	Originality/Enrichment
"G.3.1.7. Uses art elements and design principles when creating visual artworks."	"Visual Communication and Formatting"	Flexibility/Enrichment
"G.3.3.4. Expresses his judgment about the work of art he is examining."	"Art Criticism and Aesthetics"	Enrichment
"G.3.2.3. Explains the relationship between matter, form and function of works of art.	"Cultural heritage"	Enrichment

Table 4. *Divergent Thinking Sub-Dimensions Regarding Creativity in the 4 th Grade Outcomes of the Visual Arts Curriculum*

Outcomes	Learning Area	Divergent Thinking Sub-Dimension
"G.4.1.1. uses formatting steps when creating visual artwork."	"Visual Formatting and Communication"	Enrichment/Flexibility
"G.4.1.2. creates visual art work by associating his experiences with different ideas, art forms and cultural themes."	"Visual Formatting and Communication"	Originality/Enrichment
"G.4.1.3. makes choices to create unity of composition in visual art work."	"Visual Formatting and Communication"	Originality
"G.4.1.6. makes three-dimensional works using different materials."	"Visual Formatting and Communication"	Originality/Enrichment
"G.4.1.7. uses art elements and design principles when creating visual artworks."	"Visual Formatting and Communication"	Originality/Enrichment
"G.4.2.3. Compares the general characteristics of works of art made in different cultures.	"Visual Formatting and Communication"	Enrichment
"G.3.3.4. Expresses his judgment about the work of art he is examining."	"Art Criticism and Aesthetics"	Enrichment
"G.3.2.3. Explains the relationship between matter, form and function of works of art.	"Cultural heritage"	Enrichment

Creativity in the 4th Grade Outcomes of the Visual Arts Course Curriculum

As a result of the analysis of the data obtained, the findings regarding the availability of creativity in the 4th grade outcomes of the visual arts course are presented in Table 4.

G.4.1.1. outcome enrichment, flexibility, G.4.1.2. outcome originality and enrichment, G.4.1.3. outcome originality, G.4.1.6. outcomes originality and enrichment, G.4.1.7. outcome originality and enrichment, G.4.2.3 and G.4.3.1. outcomes were associated with enrichment sub-dimensions.

Discussion and Conclusion

In this research, primary education visual arts course curriculum 1-4. class outcomes examined Guildford's factorial theory sub-dimensions of divergent thinking; fluency, flexibility, originality and enrichment. According to the first sub-objective of the results in the research, in the 1st visual arts lesson, considering that the 2nd, 4th, 8th, 9th and 10th outcomes related to the "Visual Communication and Formation" learning field in the first grade Visual Arts Curriculum are thought to have the characteristics of supporting creativity, it is possible to understand whether they are supported by practice in the theoretical context, by examining the appropriateness of the outcome to the student.

Özcan (2017) and Pekdağ (2011) stated in their studies that the program's learning outcome is clear and simple. In Ertürk (2011) study, it was stated that the outcomes were not applicable. In Yurdakal's (2019) study, it is similar to Ertürk (2011) in that the program outcomes are not suitable for the student's level.

Pekdağ (2011) stated that they were undecided about the suitability of the outcomes for the age group in their study, in which they examined the program through the opinions of teachers. Although the 1st grade "Visual Communication and Formatting" learning area 4th and 8th outcomes seem to serve creativity, if the activity implemented in the classroom does not support originality, it may cause the originality sub-dimension to remain in the background.

For example, the expressions "creates by inspiration" in the 4th learning outcome and "creates a product as a result of the observations around" in the 8th learning outcome may not be appropriate for a 1st grade student. Because being inspired for this age group; It can prevent originality as it will create a tendency to copy rather than produce original products by being inspired.

Although three-dimensional work in the 9th learning outcome supports the originality and enrichment sub-dimension, it may not be possible for 1st year students to complete the work in 35 minutes, since only one lesson hour is allocated for the outcome. More course hours should be given especially to the outcomes where creativity is developed by putting out products.There are similar studies (Pekdağ, 2011; Şenkaya, 2021; Batur, 2010; Aşılıoğlu, 2012) in the field where the visual arts course hours are insufficient.

The fact that Visual Communication and Formation outcomes are more included in the program supports art education and partially serves creativity. In his research, Canikoğlu (2016) found that, in parallel with this study, the detailed consideration of the outcomes of the Visual Communication and Formation learning field feeds art education.

According to the second objective of the result in the study, in the second-grade Visual Arts lesson, the 1st outcome of the Visual Arts Lesson second grade curriculum "Visual Communication and Formation" learning area leads to producing solutions to the problems encountered, it has been associated with both fluency and enrichment sub-dimensions of creativity. However, outcomes numbered 3, 7 and 8 are originality; Since learning outcome 4 requires inspiration from different themes, and learning outcome 9 requires doing three-dimensional work, it fosters originality and enrichment. During three-dimensional studies, the lack of teaching materials can hinder students' creativity.

In their study, Yılmaz and Bilici (2016) drew attention to the necessity of obtaining course teaching materials by the state, which is important when presenting a product. Using art elements in the 10th learning outcome; flexibility as it requires using different colors, shapes and forms; It is related to the sub-dimensions of fluency, flexibility and enrichment

in terms of providing a large number of combinations while creating the composition.

According to the third objective of the result in the study, in the third-grade Visual Arts lesson, the necessity of using an expressive approach in their products in the 2nd acquisition related to the "Visual Communication and Formation" learning field in the third grade curriculum of the Visual Arts Course will bring about reflecting their feelings to their studies, the expression "produces ideas about the resources during the studies" in the 3rd learning outcome is in question both the number and variety of resources and fluency associated with the flexibility dimension.

The 3rd learning outcome in the field of Cultural Heritage learning is designed to explain the item-form relationship. Since this situation will bring about analysis and evaluation, it serves the enrichment sub-dimension of creativity. It is thought that the steps of interpretation and analysis in the 4th learning outcome in the field of "Art, Criticism and Aesthetics" directly serve creativity.
In the 4th grade curriculum, similar to the 1st grade, it is seen that the outcomes that support creativity are gathered in the field of Visual Communication and Formation learning.

According to the fourth objective of the result in the study, in the fourth-grade Visual Arts lesson, the expression uses the formatting steps in the 1st learning outcome; It starts with brainstorming on the chosen topic, and it is thought to feed creativity by following the processes of synthesizing ideas, passing to visual formation after the design and sketching process. Because, specifying in the program that the work that includes the forming steps (idea, sketch, material selection, design and product) should be done on the subject of "waste" contradicts the flexibility sub-dimension of creativity.

Moreover, the emphasis on the necessity of including values in the same lesson on the specified subject may prevent the child from creativity. Assuming the effect of culture on our creativity, children will shape their values, and perhaps they will not be able to reflect their thoughts completely on the picture. At this point, it is possible to benefit from the multidimensional and questioning thinking structure of visual arts education only by encouraging creativity. Another aim of visual arts education is to raise individuals who can perceive the mistakes experienced in the society in which the individual lives, evaluate them with the critical point of view of art, and shape the actions and thoughts that may benefit the society by using creativity. At this point, creativity should be encouraged without limiting the individual in the context of any culture and value. As a matter of fact, De Bono (1996) stated that creativity is an improvable skill that only people who can see what others cannot see, stated that the process of creativity can expand when there is no limit in the mental world. However, creativity is an expression skill and an important skill that affects the creativity of the student in the visual arts course is the self-efficacy skill. If the visual arts curriculum supports students to express their feelings and ideas without any hindrance, they will be able to develop their creative expression skills (Stone & Hess, 2020).

In the 2nd learning outcome, the creativity of the teacher comes into play by not giving any activity examples. In a way, this can give an opportunity to support creativity. Teachers can develop examples of activities suitable for their own conditions together with their students. For this outcome, the "Let's Dance with Different Colors" event can be organized. By listening to children's songs from countries from different cultures, feelings and thoughts can be turned into pictures and discussed.

Each teacher may not have the same interest and equipment in the visual arts lesson. Serving creativity in lesson outcomes where teacher characteristics come into play is somewhat related to teacher equipment. For this reason, regulations can be made on the courses that support creativity in in-service trainings for teachers. There is no different consensus in the field on this issue. Ergin, Akseki, and Deniz (2012) determined in the study that in-service training needs were determined, that classroom teachers wanted to be subject to visual arts courses.

In Batur's (2010) study, he stated that teachers who have been trained in the field of visual arts should attend the lesson. The participation of branch teachers in the course encourages an obstacle in front of building creativity by establishing relations with other courses. Because the branch teacher does not have the equipment to associate with the courses that require special content knowledge such as Mathematics, Turkish and Life Sciences. However, how contemporary visual art is connected with science, mathematics, social studies and language arts and supporting the connections to correct and appropriate applications will affect the development of creativity skills (Marshall, 2019).

The expression "uses art elements and principles of art" in the 7th learning outcome is directly related to the enrichment sub-dimension of creativity, as it includes color, texture, value and variety.

In the field of Cultural Heritage learning, the only outcomes was found to be related to creativity. The 3rd outcome of the learning area is about comparing the general characteristics of works of art made in different cultures. Thus, especially Turkish culture, Europe, Asia, Africa etc. form, subject, material, technical features, etc. of works of art belonging to at least two cultures, such as in terms of comparison.

Comparing and analyzing similarities and differences is related to the enrichment sub-dimension of creativity. In the field of cultural heritage learning, it is important to integrate museums into learning environments. Getting support for virtual museums from web 2.0 tools in schools where environmental conditions are not suitable; will act as a locomotive in the integration of art. Metan (2007) found that museum activities were lacking in his study. Tezcan Akmehmet (2018) determined that the teachers did not provide sufficient information about museum education and did not explain how to establish a relationship with the learning area. In this study, common features were found and considering the importance of establishing new relationships in terms of creativity, cultural learning field outcomes remained weak in this respect. Moreover, the outcomes often encourage the student to work individually. However, it is seen that educational environments built on cooperation and associated with other courses in which team spirit is instilled increase creativity (Özcan, 2017; Batur; 2010; Göknur, 2011).

When the primary 1-4 visual arts curriculum is considered in terms of creativity as a whole, it is seen that the reorganization of the outcomes of the curriculum is necessary for the creativity of the curriculum. Also, it should be added the outcomes support creativity in the field of "Cultural Heritage" and "Art Criticism and Aesthetics".

Suggestions

1- Attention should be paid to the fact that the curriculum commissions are composed of people who are competent in the field of visual arts.

2- Optional in-service training should be offered to teachers who do not feel competent in the visual arts class and think that they do not serve the creativity of the students sufficiently, by taking the opinions of the teachers.

3- It is obvious that the outcomes cannot be achieved with a single lesson hour per week. The course hours should be increased and the necessary materials should be provided free of charge in the art course, just as free course materials and books are provided to the students in other courses.

4- Art workshops should be made compulsory for every school for art works that are difficult to do in the classroom.

5- Since it is seen that most of the outcomes that support creativity are gathered in the field of Visual Communication and Formation learning, the program should be balanced by adding the learning areas of Cultural Heritage, Art Criticism and Aesthetics that support creativity.

6- The school may not be suitable for raising museum awareness as an environment. At this point, awareness of class teachers can be created to enrich the lesson with virtual museums from web 2.0 tools. The outcomes related to the museum can be integrated into the course through virtual museums.

7- In the context of integrated education, the visual arts course outcomes associated with other course outcomes can be prepared as a guide handbook for teachers

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Academy Journal of Educational Sciences
November 2022, Volume 6, Issue 2, 77-84

Social Justice Leadership Scale In Distance Education: A Validity and Reliability Study*

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Abstract

Social justice leadership has become a necessity in education as in many other fields. It is important to see how much this need is met in the world of education and most importantly, this leadership is seen from the eyes of students. Minimizing the disadvantage in the distance education process is possible with social justice leadership. The aim of this research is to develop a scale of social justice leadership of teachers during distance education, based on student opinions. The research was carried out with the participation of 156 students studying in secondary schools in the district of Yerköy, Yozgat, Turkey. Content validity of Social Justice Leadership Scale In Distance Education (SJLSDE) was ensured based on expert opinions. The construct validity of SJLSDE was evaluated by performing exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). As a result of EFA and CFA, it was observed that SJLSDE has a structure consisting of 13 items and four factors: critical view, active participation, justice and support. As a result of the examination of the Cronbach alpha coefficient values performed on the factors of the SJLSDE as a whole, it was seen that the SJLSDE was highly reliable with .90 Cronbach alpha. For the dimensions of justice, support, critical view and active participation, Cronbach's alpha coefficients are calculated as .73, .72, .79 and .70, respectively. Based on these findings, it was concluded that SJLSDE is a valid and reliable scale that can be used to determine the social justice leadership of teachers in the distance education process.

Keywords: Social Justice, Leadership, Validity, Reliability, Distance Education

Introduction

The future of societies is closely related to the education offered to their generations. Behaviors acquired through education shape society as well as the individual. This relationship between individual and social change is the source for determining the vision and mission of educational institutions. Today, the primary purpose of all educational institutions is to increase the quality of education (Karaca, 2008). The quality of education in schools, which is the source of knowledge, can be guaranteed by the stakeholders in the process of working in harmony with each other, developing and renewing themselves by taking responsibility and by providing equal opportunities and equal standards for each student.

Equal opportunity in education is one of the basic principles of education all over the World (Arslan, 2022). However, there is still a group who are disadvantageous in accessing education opportunities today. (Ertaş & Yüner, 2021). Therefore, social justice can be accepted as research area with a high priority. The concept of social justice has been studied within the framework of the social state principle (Bozkurt, 2018). Fraser (2012) defined social justice as the belief which starts with the acceptance of the idea that all humans have dignity, they are equal and they deserve equal access to all opportunities.

Social justice leadership, another noteworthy concept related to social justice, is defined as "the exercise of altering the arrangements by actively engaging in reclaiming, appropriating, sustaining, and advancing inherent

About the Article

Type: Research
Received: 4 September 2022
Accepted: 19 December 2022
Published: 29 December 2022
DOI: 10.31805/acjes.1141273
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*This article is derived from İsmail Arslan's master's thesis conducted under the supervision of Berna YÜNER

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Suggested APA Citation

Arslan, İ., & Yüner, B.. (2022). Social Justice leadership scale in distance education: A validity and reliability study. *Academy Journal of Educational Sciences, 6*(2), 77-84. http://dx.doi.org/10.31805/acjes.1170903

human rights of equity, equality, and fairness in social, economic, educational, and personal dimensions, among other forms of relationships" (Goldfarb & Grinberg, 2002). In education, social justice leadership is concerned with showing leadership behaviors that will ensure that students in schools have equal education and training opportunities. There is no single definition of this type of leadership, but the focus is on creating teaching opportunities for each student. Gören (2019) states that the characteristics of social justice leadership are to having a critical consciousness and thought, defending transformational change, raising awareness of marginalization and differences, creating an inclusive, democratic, and sense of belonging (feeling) culture, focusing on equality, ensuring that every student can be successful, giving importance to compassion, interest and thought in relationships, and a strong sense of dedication and commitment.

There are students with different demographic and socio-economic characteristics in schools. Social justice leaders try to prevent these differences from turning into disadvantages. As a requirement of social justice, providing equal opportunities to these students with their peers and providing the necessary assistance can improve the teaching-learning environment, and consequently, increase the quality of education (Koçak & Özdemir, 2019).

Educational administrators have an important role in ensuring social justice. The work carried out with the stakeholders in school is important in the equal distribution of the opportunities offered to both teachers and students. In recent years, it has been emphasized in the field of education that planning, implementation, and evaluations in schools assign importance to concepts that increase the quality of life and place justice at the center of education in schools. Social services have great importance in ensuring social justice. Kaynak (2017) explained the welfare level of countries with criteria focused on social justice. Ensuring equality of opportunity in education is accepted as a necessary criterion for the establishment of social justice in wealthy countries.

Research on the concept of social justice has increased significantly in the 2000s compared to previous years (Gören, 2019). The subject of social justice has been associated with leadership and studies that support social justice in schools have been discussed in the 2000s. These studies examine students' perceptions of social justice (Gören, 2019, Kütküt & Özdemir, 2015), teachers' perceptions of social justice (Bozkurt, 2018; Koçak & Özdemir, 2019; Özdemir & Pektaş, 2017; Turhan, 2007), or school principals' perceptions of social justice (Börü, 2019; Turhan, 2007).

Many studies have been conducted on the effects of social justice perception of teachers. It has been observed that leadership behavior exhibited by school principals predicts organizational citizenship and organizational commitment of teachers (Bozkurt, 2019). In addition, school leaders' social justice behaviors in schools, increase the quality of school life and the sense of belonging (Gören, 2019). As the research carried out by Börü (2019) indicates, studies on critical citizenship education contribute to the formation of new ideas about social justice.

Bozkurt (2018) examined the relationship between the concept of social justice leadership, commitment to the manager and organizational citizenship of secondary school teachers. It has been observed in the study that social justice leadership behavior is a predictor of both concepts. The study also revealed the worth of school principals' social justice leadership behaviors.

Börü (2019) conducted a study on the implementation of social justice in primary schools and evaluated the leadership behaviors of school principals. In this study, it was stated that teachers and administrators should carry out their duties with care and sensitivity. In addition, there should be changes in the legislation to establish social justice. Kondakçı et al. (2016) stated that the social justice roles of school principals in Turkey remain in the secondary importance and that only after this negative perception disappears, disadvantaged schools will improve and student succes will increase. In addition, it was stated that the centralist structure in Turkey harmed disadvantaged schools, and they attributed this to the misconception that all public schools had the same characteristics.

In the literature, there have been studies regarding different dimensions of social justice. Özdemir and Pektaş (2017) and Cribb and Gerwirtz (2003) examined the social justice in three dimensions: associational justice, distributive justice, and cultural justice. The idea of distributive justice deals with the idea of equitable distribution of material and moral resources to stakeholders. Cultural justice encompasses the idea of equity between groups separated by cultural differences. Associational justice includes the fair participation of individuals or groups in decision-making in social life.

Gürgen (2017) conducted a qualitative research on the perception of social justice in schools and also examined social justice in three dimensions: recognitive, distributive and democracy (participation). With recognizable justice, it is aimed to reveal the similarities and differences of all cultural groups. These dimensions are concerned with the recognition of groups oppressed by dominant groups. Distributive justice is about the equal distribution of social rights, positions and goods to individuals or groups, and focuses on providing equal opportunities and providing more resources to disadvantaged groups. Democracy (participation), on the other hand, is concerned with providing the opportunity for each individual to realize themselves.

Çelik (2015) explained dimensions of social justice leadership as personal, interpersonal, communal, systemic, and ecological dimensions. The personal dimension is directly related to the leader's ability to self-criticize. Self-criticism reveals the deficiencies of the school leader. Thus, the leader will get to know himself better, and with this recognition, he will make better decisions and increase the quality of education. The interpersonal dimension establishes the foundations of social justice, enabling leaders to establish quality communication with other people and to interact with people or groups that remain as a minority in the educational environment. With this communication and interaction, the quality of education becomes higher. The group (social) dimension is related to the coexistence of different cultures in a sense of justice. The group dimension, which is also related to the democratic understanding, enables minorities and disadvantaged groups to be involved in the decision-making process. The group dimension, which enables teachers and students with different characteristics to participate more effectively in the work in the school, receives support from the principles of democracy and from the interpersonal dimension. The systemic dimension includes the activities to be carried out systematically by the school administrator in order to eliminate the injustices stated in the criticisms brought to the educational environment. School administrators ensure that social justice is centralized in all elements established in the educational institution. The ecological dimension constitutes the largest part of social justice regarding educational institutions. The socio-political, environmental, and economic factors that the educational institution is in contact with effect the sustainability of social

justice. Applications for the ecological dimension aim at improving the bond between education and social life. In order to achieve this goal, all issues related to social life should be analyzed and explained to the stakeholders of education. Topics to be analyzed are local, environmental, cultural, social, and economic issues. Projects on these issues should be implemented, especially with students, and studies that explain this situation should be included in educational institutions. The link between the educational institution and the environment should be strengthened.

In addition, Fraser (2005) studied social justice with the dimensions of redistribution, recognition, and representation; Kütküt and Özdemir (2015) studied social justice leadership with the dimensions of support, critical consciousness, and participation. Koçak and Özdemir (2019), on the other hand, explained dimensions of social justice leadership as students supporting disadvantaged students, inclusion and critical consciousness. As can be seen, different dimensions have been revealed in the studies carried out on social justice leadership in educational organizations. Today, the effects of a global pandemic are seen in education. COVID-19 has been named as the pandemic process by the WHO and mandatory changes have been made in education practices all over the world. Education and training activities were postponed, schools were closed for face-to-face education, distance education activities were carried out online or via television.

This compulsory transition process caught the education systems unprepared and caused new problems in ensuring equality of opportunity in education (Ertaş & Yüner, 2021). Economic conditions that differ from person to person or from country to country have affected the quality of education services offered (Ertaş & Yüner, 2021). In this direction, the importance of effective implementation of social justice leadership in the distance education process is increasing. Within the scope of this study, it is aimed to develop a measurement tool that can be used to determine the social justice leadership levels of teachers in the distance education process.

It is aimed that the social justice leadership behaviors to be performed by teachers in the distance education process in educational institutions will increase the quality of education and learning activities. It was aimed to develop the SJLSDE, which measures the social justice leadership levels of teachers in the distance education process according to the views of students.

In the study, answers to the following questions were sought:

1. Is the SJLSDE a valid scale?

2. Is the SJLSDE a reliable scale?

Method

Study Group

In the first stage of the study, 156 secondary school students (5th, 6th, 7th, and 8th grade) were reached online. 101 (35%) of the participants were female and 55 (65%) were male. 57 of them were in the 5th grade, 27 were in the 6th grade, 24 were in the 7th grade and 48 were in the 8th grade. 113 participants were the students of imams and preachers lower secondary school while 43 of them were in lower secondary schools. Since there are only official schools in Yerköy district of Yozgat, there is no distinction between public and private schools. There are 9 secondary schools in the district in total. In the second stage of the study, to test the validity of the construct, the study was conducted with students of secondary schools affiliated to the Ministry of National Education in the Yerköy district of Yozgat in the 2020-2021 academic year. The number of students in total is 2089. Assuming the total population -with a sampling error of ± .5, that is, for the 95% confidence interval, the p value is .05, the q value is .05 and the α value is .05- the formula $n=(Nt^2pq)/(d^2(N-1)+t^2pq)$ was calculated and it was found that 324 students can represent population (Kayabaşı, 2010; cited in: Arslan & Kurtoğlu, 2021).

First of all, Mahalanobis distances and frequency values were calculated to determine the outliers and extreme values of the data obtained from 387 students, and a normality test was carried out to determine the suitability of the data set for statistical analysis. In this context, the kurtosis and skewness coefficient values of the groups were calculated. The data belonging to 26 students, which were calculated as extreme or missing values at this stage, were excluded from the analysis ($p< .0001$). The remaining data on 361 students were analyzed in the study. The frequencies and percentages of the students who were included in this study are presented in Table 1.

Data Collection Tools

In this study, it is aimed to develop a valid and reliable measurement tool that serves to determine the social justice leadership of teachers in the distance education process according to student opinions. "Social Justice Leadership Scale in Distance Education" developed in the study is abbreviated as SJLSDE. In order to develop the scale, an item pool was created based on the national and international literaure, taking into account the principles of social justice and the distance education process together. While preparing the items, the reflections of social justice leadership on the distance education process were evaluated. Opinions of experts on the field of education were consulted for the prepared form and a draft form was obtained in line with the opinions of the experts. The scale was prepared in a 5-point Likert format. Items in the scale ranged from 1 to 5. The scale is graded as "1-Strongly Disagree", "2-Disagree", "3-Neutral", "4-Agree" and "5-Strongly Agree".

Data Analysis

The form was applied to 156 students studying at secondary school level in Yerköy, Yozgat, in 2020-2021 academic year. In this section, the Mahalanobis distances of the data were calculated. 31 answers, which were determined as extreme or missing values, were excluded from the analysis ($p<.0001$). 125 students answers were left in the scale. In order to test the construct validity of the 33-item draft scale, the Kaiser-Meyer-Olkin (KMO) coefficient value and the Bartlett Sphericity test were used to determine its suitability for factor analysis. EFA was conducted.

To analyse the factor structure of the scale, eigenvalue and line plot (Scree Plot) were used. Eigen-values of 1 and above and steep descents in the line graph were taken into account in clarifying the number of factors. The factor loading values was analyzed as .45. Items placed under more than one factor had a difference of at least .10 so that the items did not overlap (Büyüköztürk, 2007).

The four-factor structure formed after EFA was tested with CFA which was performed on 361 answers. As a result of the analysis, the goodness of fit values of the scale were evaluated according to the indexes accepted in the literature. In the literature, it has been stated that the ratio of the X^2 value to the degrees of freedom should be five or less (Kline,

Table 1. *Frequencies and Percentages of Demographic Data on Participating Students*

Variable	Level	f	%
Gender	Female	236	65.4
	Male	125	34.6
Number Of Siblings	One Child	64	17.7
	Two Siblings	14	3.9
	Three siblings	132	36.6
	Four Or More Siblings	151	41.8
Mother Education Level	Never Went To School(Illiterate)	9	2.5
	Primary School Dropout	22	6.1
	Primary School Graduate	110	30.5
	Secondary School Graduate	95	26.3
	High School Graduate	95	26.3
	University Graduate	30	8.3
Father Education Level	Never Went To School(Illiterate)	7	1.9
	Primary School Dropout	11	3.0
	Primary School Graduate	70	19.4
	Secondary School Graduate	69	19.1
	High School Graduate	152	42.1
	University Graduate	52	14.4
School Type	Imam Hatip Secondary School	198	54.8
	Normal Secondary School	163	45.2
Location of the School	District Center	330	91.4
	Town	15	4.2
	Village	16	4.4
Bussed Education	Yes	56	15.5
	No	305	84.5
Grade Level	5th Grade	56	15.2
	6th Grade	67	18.4
	7th Grade	89	24.8
	8th Grade	149	41.6
Level of Participation in Live Classes	Never Participated	6	1.7
	Rarely Participated	40	11.1
	Sometimes Participated	83	23
	Usually Participated	112	31
	Always Participated	120	33.2
Device Type	Phone	238	65.9
	Tablet	51	14.1
	Computer	68	18.8
	Other	4	1.1
Number of Available Devices	Only 1	199	55.1
	2	111	30.7
	3 or More	51	14.1
Commonly Used Connection Type	Phone Internet (Mobile)	75	20.8
	Wifi (Wired Or Wireless Home Internet)	286	79.2

2005). In addition, it was accepted that the RMSEA value was less than .08 and the CFI, NFI, NNFI, GFI and AGFI values were above .90. In order to see the reliability of the scale, the Cronbach Alpha coefficient of the each of four factors and the overall scale was calculated. Lisrel 8.70, Microsoft Excel, and SPSS 22.0 were used for all calculations in the data analysis. For convergent validity, the average variance AVE (Average Varience Extracted) value explained together with the factor loadings was checked. To see the reliability of the scale as a whole and the Cronbach alpha of the four factors and the CR (Composite Reliability) coefficients for the combined reliability were calculated.

Results

The KMO coefficient value and the Bartlett Sphericity test were used to determine whether the SJLSDE was suitable for factor analysis in order to determine the construct validity. In order to be suitable for factor analysis, the value of the KMO coefficient should be greater than .60 and the Bartlett Sphericity test should be significant (Büyüköztürk, 2007). As a result of the analysis, it was found out that the KMO coefficient value of SJLSDE was .806 and the Bartlett Sphericity value was also significant (p<.05). As these results indicate, the scale was accepted as suitable for factor analysis. Within the scope of this study, factor analysis was repeated with the Principal Axis Factoring. The dimensions of the scale and the items included in the dimensions did not change. The results of the EFA and CFA applications for the construct validity of SJLSDE are given below.

Exploratory Factor Analysis

EFA was applied to 33 items in the draft scale. As a result of the EFA of the items in the draft scale, 20 items with a factor loading below .45 were not included in the evaluation. While determining in which factor the items in two or more factors from the remaining 13 items would be found, importance was given to the factor loading value difference being at least .10 (Büyüköztürk, 2007). As a result of the analysis, it was determined that SJLSDE represents a four-factor structure. Table 2 shows the factor loadings resulting from the EFA performed with these items and their distribution to the factors.

The four dimensions that make up the SJLSDE as seen in Table 2 were named as justice, support, critical view and active participation. SJLSDE as a whole explains 70.06% of the total variance.

There are 3 items in the first dimension of SJLSDE. This dimension is related to the teacher's giving importance to the principles of legality, accountability, equality and justice in education, and consists of items such as" My teacher abides by the principle of equality in award distribution.", "Evaluation is fair (Fair in grading)" and "My teacher does not discriminate between students in his classes.". It is called justice because it has items regarding justice and equal treatment. It is seen that the factor loading values of the items in this dimension are greater than .80. The reliability value of the justice dimension was calculated as .85 and it is sufficient for this value to be greater than .70 for the reliability of the scale (Balcı, 2001). The variance rate explained by this dimension alone was calculated as 35.68%, and it can be stated that this calculated value is greater than .30, providing good discrimination (Büyüköztürk, 2007). It was determined that the item-total correlation values of 3 items in this dimension were between .65 and .75.

There are 4 items in the second dimension of SJLSDE. This dimension is composed of the following items; "My teacher notifies the school administration of students who cannot access the course.", "My teacher takes necessary precautions so that students can use technology.", "My teacher provides additional live lessons to students who need support." and "My teacher actively supports the development of disadvantaged students". It was named as "support" because it has items related to the teacher giving importance to supporting students in education. It is observed that the factor loading values of the items in this dimension are greater than .65. The reliability value of the support dimension was calculated as .73, and it is sufficient

Table 2. *Factor Loadings of Items in EFA and Item Total Correlation*

Item	Expressions	Fac. 1	Fac. 2	Fac. 3	Fac. 4	Item Total Correlation
25	Evaluation is fair (Fair in grading).	.850				.780
23	My teacher does not discriminate between students in his/Her classes.	.763				.677
26	My teacher abides by the principle of equality in award distribution.	.824				.739
22	My teacher takes necessary precautions so that students can use technology.		.751			.587
28	My teacher actively supports the development of disadvantaged students.		.727			.575
20	My teacher notifies the school administration of students who cannot access the course.		.518			.458
24	My teacher provides additional live lessons to students who need support.		.599			.512
4	My teacher allows students to express their thoughts clearly.			.826		.635
8	My teacher respects student rights.			.744		.637
2	My teacher is tolerant of different ideas.			.511		.502
11	My teacher encourages students to attend live classes.				.892	.621
14	My teacher ensures the participation of all students in the coursework.				.672	.628
32	My teacher supports the participation of students in decisions.				.455	.542
KMO= .806, Bartlett=.000, p<.05 , Total Variance Explained= %70.06						
* Factors were neamed as follows; Factor 1 justice; Factor 2 support; Factor 3 critical view; Factor 4 active participation.						
** Values below .45 are not shown.						

for this value to be greater than .70 for the reliability of the scale. The rate of variance explained by this dimension alone was calculated as 10.13%. It was determined that the item-total correlation values of 4 items in this factor were between .45 and .60.

There are 3 items in the third dimension of SJLSDE. This dimension is named as critical view because it has items such as "My teacher is tolerant of different ideas.", "My teacher allows students to express their thoughts clearly." and "My teacher respects student rights.", which are related to the teacher giving importance to students' critical thinking in education. It is seen that the factor loading values of the items in this dimension are greater than .70. The reliability value of the critical view dimension was calculated as .75 and it is sufficient for this value to be greater than .70 for the reliability of the scale. The rate of variance explained by this dimension alone was calculated as 7.19%. In addition, the item-total correlations of 4 items in this dimension were found to be between .50 and .65.

There are 3 items in the fourth dimension of SJLSDE. "My teacher encourages students to attend live classes", "My teacher supports the participation of students in decisions" and "My teacher ensures the participation of all students in the coursework", it is named as active participation because it has items related to the teacher's giving importance to students' participation in activities in education. It is seen that the factor loading values of the items in this dimension are greater than .60. The reliability coefficient of the active participation dimension was calculated as .76 as a result of the scale development process, and it is sufficient for this value to be greater than .70 for the reliability of the scale. The rate of variance explained by this dimension only was calculated as 4.81%. However, if rate of variance is greater than .30, it is expressed as providing good discrimination (Büyüköztürk, 2007). In addition, item-total correlations of 3 items in this dimension were found to be between .50 and .65.

Item-total correlation values were examined to determine the discrimination value of the items under the factors. It has been observed that the item-total correlation values of .30 and above in the scales in the literature provide good discrimination (Büyüköztürk, 2007). It was observed that the item-total correlations of the items in the justice, support, critical view and active participation factors of SJLSDE were between .45 and .79. Based on these data, it was determined that the discrimination of the items in SJLSDE was high.

Findings Related to Confirmatory Factor Analysis

The four-factor structure that emerged after EFA was tested with CFA. First of all, the t-values of the items were examined in the path diagram and it was determined that all items were significant ($p<.05$). As a result of the analysis, the ratio of X2 value to degrees of freedom was calculated as 1.76. RMSEA value was calculated as .04, other goodness-of-fit values as SRMR=.045, GFI=.99, AGFI=.98, NFI=.95, CFI=.98. In the light of these data, it has been concluded that SJLSDE confirms the four-factor structure and is a valid scale (Büyüköztürk, Çokluk & Köklü, 2012; cited in Yüner, 2019).

Findings Related to the Reliability of The Social Justice Leadership Scale in Distance Education Process

In order to determine the reliability of the Social Justice Leadership Scale in The Process of Distance Education, the Cronbach's Alpha internal consistency coefficient of the scale was calculated together with the four factors and one by one. These calculated values are given in Table 3.

Table 3. *Results of Model Reliability Analysis (Croncbach Alpha (α) Coefficent), Average Variance Extracted (AVE) and Composite Reliability (CR) for Dimensions of SJLSDE*

Reliability Statistics			
Scale and Dimensions	Cronbach's Alfa	AVE	CR
SJLSDE	.90		
Intrinsicity Between Dimensions	.86		
Justice	.73	.69	.89
Support	.72	.50	.79
Critical View	.79	.61	.83
Active Participation	.70	.57	.80

In Table 3, it is seen that the internal consistency reliability value among the dimensions of SJLSDE is .86 and the internal consistency reliability value between 13 items is .90. Cronbach's alpha coefficients for SJLSDE, were calculated as .73 in the dimension of justice, .72 in the dimension of support, .79 in the dimension of critical view and .70 in the dimension of active participation. The reliability coefficient calculated in such scales is .70 and higher, which is considered sufficient for the reliability of the scale (Balcı, 2001). Average Varience Extracted (AVE) for SJLSDE, were calculated as .69 in the dimension of justice, .50 in the dimension of support, .61 in the dimension of critical view and .57 in the dimension of active participation. Average Varience Extracted value calculated in such scales is .50 and higher, which is considered sufficient for the reliability of the scale (Fornell & Larcker 1981; Anderson, Babin, Black & Hair, 2010; cited in: Korkmaz & Zorlu, 2020). Composite Reliability (CR) for SJLSDE, was calculated as .89 in the dimension of justice, .79 in the dimension of support, .83 in the dimension of critical view and .80 in the dimension of active participation. Composite Reliability coefficient calculated in such scales is .70 and higher, which is considered sufficient for the reliability of the scale (Fornell & Larcker 1981; Anderson, Babin, Black & Hair, 2010; cited in: Korkmaz & Zorlu, 2020). In line with the data obtained, it was decided that SJLSDE is a reliable scale.

Discussion, Conclusion and Recommendations

In this study, social justice leadership in the distance education process was developede. Social justice leader is the leader who stands by the marginalized groups due to their differences and puts this thought at the center of the leadership behavior. In the distance education process, it was observed that the studies on social justice leadership were quite limited. For this reason, it is aimed to develop a valid and reliable scale suitable for determining the level of social justice leadership in the distance education process. In order to develop the scale, an item pool was created by reviewing national and international resources in the relevant field. In this process, the principles of social justice and the distance education process were considered together. Care was taken to ensure that the items were compatible with the distance education process by making use of expert opinions.

A 33-item draft form was prepared in line with the opinions of the experts whose opinions were consulted. The construct validity of the scale was examined with EFA and it was seen that it had a four-factor structure representing the scale. It was determined that the scale as a whole explained 70.06% of the total variance. In order to determine the distribution of the items under the factors, the factor loadings of the items were calculated. Items, which were below the .45 factor loading and were found to be overlapping, were gradually

removed from the scale as a result of these calculations. As a result, it was seen that SJLSDE was represented by a structure with 13 items and four factors, and these four factors were named as justice, support, critical view and active participation.

The structure of the 13 items and four-factor scale, which was handled as a result of EFA, was tested with CFA. It has been determined that the goodness of fit values calculated as a result of CFA are within the reference ranges accepted in the literature and the designed theoretical model has a high agreement with the data. When the results of EFA and CFA were evaluated, it was concluded that SJLSDE is a valid scale. Item-total correlations were calculated for the discrimination of the items in SJLSDE. As a result of this calculation, it was determined that the discrimination levels of the items in the scale were compatible with the reference values determined in the literature.

In order to determine the reliability of SJLSDE, the Cronbach alpha coefficients of the factors and the scale as a whole were calculated separately. The calculated values prove that SJLSDE is a reliable scale. Based on these findings, it was concluded that SJLSDE is a reliable scale for determining the level of social justice leadership in the process of distance education. In this study, the validity and reliability of the social justice leadership scale in the process of distance education were tested. The study can be repeated with study groups with more participation. Significant outputs can be produced as a result of its application, especially at primary and secondary education levels. Thanks to the studies to be carried out with SJLSDE in the future, the current situation of the schools in the transition from normal education to distance education can be revealed, the points that need to be improved can be determined, and thus the precautions to be taken for the distance education process can be taken in advance. The relationships between social justice leadership in the process of distance education and school culture, climate, education quality, student success, online classroom management and school-related behaviors can be investigated. The effect of social justice leadership on outcomes such as school effectiveness, student success, and satisfaction of school stakeholders can be addressed.

Even if the pandemic process is over, distance education has now become an inevitable element of education systems. For this reason, it is critical to ensure social justice and teachers' social justice leadership in order to minimize possible losses in the distance education process. Especially for the disadvantaged students, the studies to be carried out in accordance with the social state principle in the distance education process will increase the quality of the education service that these students will receive. For this purpose, the scale developed to determine the level of social justice leadership of teachers in educational institutions in the distance education process is important in terms of shaping the educational activities to be implemented.

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Academy Journal of Educational Sciences
November 2022, Volume 6, Issue 2, 85-96

Investigation of the Relationship of Self-Efficacy, Self-Regulation and Metacognitive Awareness with Academic Performance through Artificial Neural Networks*

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Abstract

Metacognition is defined as individuals having knowledge and control over their own cognitive systems. Self-efficacy for teacher candidates is defined as a teacher's belief in the capacity or ability of his students to create the desired learning outcomes. Self-regulatory learning, on the other hand, is defined as thoughts, feelings and actions that are planned and applied cyclically to achieve an individual goal. In this study, it was aimed to examine the relationship between self-efficacy, self-regulation and metacognitive awareness scores and academic performance. In other studies, in the relevant literature, the relationship between academic performance and three variables, whose relationship with academic performance is examined separately, will be examined as a whole. At the same time, it will be checked whether there is a significant difference between the groups in three variable scores according to various variables. Since the aim of the research is to examine the relationship between the factors affecting the self-efficacy, self-regulation and metacognitive awareness scores of teacher candidates and the variables in question and academic performance, the relational screening model suitable for these purposes was used. The population of the research consists of teacher candidates studying in the 2022-2023 academic year at the faculty of education at a state university in the Aegean Region. The appropriate sampling method was used for data collection. Teacher Self-Efficacy Scale adapted to Turkish by Çapa, Çakıroğlu and Sarıkaya (2005), Self-regulatory Learning Skills Scale developed by Turan (2009), and Metacognitive Awareness Scale developed by Fırat Durdukoca and Arıbaş (2019) were used as data collection tools. As a result of the research, no significant difference was found in the variables of gender, department, quality of the family residence. It was determined that there was no significant relationship between family and student income variables and scale scores. In the class variable, it was found that there was a significant difference in favor of upper classes according to the three scale scores. In addition, it was determined that the three scale scores explained 47% of the total variance in academic performance..

Keywords: Artificial Neural Network, Metacognitive Awareness, Self-Efficacy, Self-Regulation, Teacher Candidate

Introduction

The concept of self-efficacy is defined as a person's personal belief in the ability to plan and carry out the actions necessary in the process of achieving the determined goals (Bandura, 1997). In other words, it can be defined as one's belief in individual competencies and potential (Sakız, 2013). Self-efficacy belief is the most important predictor of individual behaviors. In cases where individuals have the belief that they have the ability and control to perform a task, they are more willing to choose this task, express their determination in this regard, and exhibit the necessary behaviors (Sharp, 2002). Determining the self-efficacy beliefs of individuals can help explain and understand their behaviors. Based on the self-efficacy beliefs of teachers as an individual, it is possible to understand

About the Article

Type: Research
Received: 10 December 2022
Accepted: 22 December 2022
Published: 29 December 2022
DOI: 10.31805/acjes.1221980
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*This study was developed from the oral paper "Investigation of the Relationship between Self-Efficacy, Self-Regulation and Metacognitive Awareness with Academic Performance" presented at the "International Symposium on Classroom Teaching Education (USOS)" between 14-17 November 2022.

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Suggested APA Citation

Başer, E. H., & Demir, S. (2022). Investigation of the relationship of self-efficacy, self-regulation and metacognitive awareness with academic performance through artificial neural networks. *Academy Journal of Educational Sciences, 6*(2), 85-96. http://dx.doi.org/10.31805/acjes.1170903

and explain their behaviors (Korkut and Babaoğlan, 2012). It can be said that teachers with high self-efficacy successfully carry out the basic subjects in the teaching process and are different from other teachers in this regard (Kiremit, 2006). Teachers with high self-efficacy beliefs believe that they can control and at least influence student success and motivation (Tschannen-Moran, Woolfolk-Hoy, and Hoy, 1998). It can also be said that thanks to self-efficacy belief, teachers tend to struggle when faced with difficulties and to address the problem until they reach a solution (Gibson and Dembo, 1984; Ashton and Webb, 1986; Ross, 1992). When the results of the research are evaluated, it is seen that self-efficacy perception is an important factor within the scope of success in the field of education.

Self-regulation emerges as a concept related to the degree to which students actively participate in their own learning processes in terms of metacognition, motivation, and behavior (Zimmerman, 1989). According to Kauffman (2004), self-regulation is "the learner's effort to control and manage complex learning activities". Pintrich (2000) defines self-regulatory learning as an effective and positive process that involves students setting their own learning goals, controlling their cognitive, behavioral, and psychomotor characteristics, and being willing to make changes and adjustments when necessary, and being guided by their goals and environmental characteristics. Individuals who grow up in an environment where self-regulation skills are supported and developed will start their lives one step ahead. Self-regulated learning has become increasingly important in our age of rapidly increasing knowledge. It is very important for individuals to develop their own knowledge and skills day by day and to acquire information that will carry them further (Yılmaz, 2016). In this respect, it is quite a job for the teachers who regulate the teaching-learning environment. Teachers need to organize the teaching-learning environment in a way that improves students' self-regulation skills (Aybek and Aslan, 2017). This situation reveals the importance of determining the self-regulation levels of teachers while they are studying at the undergraduate level and informing teacher candidates about self-regulation skills. It is thought that the fact that teacher candidates have self-regulation skills will make it easier for students to gain this skill in their professional lives.

Flavell (1976) defined metacognition as an individual's knowledge of their own cognitive processes. Metacognition can also be defined as the processes in which individuals have knowledge about their own cognitive activities and cognitive strategies (Boekaerts, 1997). It is the individual's consciously monitoring and supervising the cognitive processes by running the prediction and planning stages (Brown, 1980). Breed, Mentz, and Westhuizen (2014) define metacognitive awareness as being aware of how the individual will learn, how to plan his/her own learning process, and the processes of organizing, structuring, and producing information. In line with this view, Schraw (2002) states that students with metacognitive awareness can plan their own learning, use more strategies and techniques in the learning process, and therefore students are more successful. It is seen that strategies consisting of three main dimensions are put to work in the development of metacognitive awareness. These are the creation of activities related to metacognition, the execution of the metacognitive process by teachers and the basis of an approach that spreads not only to the result but also to the process. In this respect, it is thought that teachers should have awareness of metacognition (Aydın, 2022). As a matter of fact, the teacher should organize the process for this situation by creating metacognitive-based learning environments in order to organize the learning process more quality. In this respect, it can be stated that it is important for teacher candidates to develop these skills and to have metacognitive awareness in order to increase learning efficiency and activity (Kalemkuş, 2021). For this reason, it can be said that it is necessary to determine the metacognitive awareness of teachers and thus teacher candidates in order to improve the metacognitive skills of students in educational environments.

When the literature is examined, it is seen that there are relationships between self-efficacy and metacognition (Nosratinia, Saveiy and Zaker, 2014; Tunca and Alkın-Sahin, 2014), between self-efficacy and self-regulation (Dağyar and Şahin, 2020), between metacognition and self-regulation (Kaya, 2019). It is also possible to see the findings in the literature showing the relationship between self-efficacy (Britner and Pajares, 2001; Coutinho and Neuman, 2008; Dağyar and Şahin, 2020), self-regulation (Bozpolat, 2016; DiBenedetto and Zimmerman, 2010; Lindner and Harris, 1993) and metacognition (Al Huseini, 2015; Coutinho and Neuman, 2008; Çıkrıkci and Odacı, 2013) variables and academic performance. The effect of these three variables, which are related both to each other and to academic performance, on academic performance needs to be investigated as a whole. It is thought that this research will make an original contribution to the literature by determining how much the three variables together predict academic performance. In this context, in this study, based on these relationships, it was tried to determine the extent to which these three variables predicted academic performance together. In this context, this study aims to examine the relationship between self-efficacy, self-regulation and metacognitive awareness scores and academic performance. At the same time, it was checked whether there was a significant difference between the groups in three variable scores according to various variables. For these purposes, the problems of the research are as follows:

1. Do the self-efficacy, self-regulatory learning and metacognitive awareness scores of the teacher candidates differ according to the variables of gender, department, class, and quality of family residence?

2. Is there a significant relationship between teacher candidates' self-efficacy, self-regulatory learning and metacognitive awareness scores and family and student income?

3. To what extent do self-efficacy, self-regulatory learning and metacognitive awareness scores explain teacher candidates' academic grade points averages?

Method

Study Pattern

This research was conducted according to the correlational research design, which is one of the quantitative research methods. The relational research model is a research model that serves to determine the existence of the relationship between more than one variable or the power of the relationship (Karasar, 1999). In this study, two types of relational research, which can be classified as predictive and exploratory (Fraenkel and Wallen, 2006), were used within the scope of this research since both inter-variable relationships and predictive levels of variables were investigated.

Population and Sampling

The population of the research consists of teacher candidates (Classroom, Preschool, Turkish and Social Studies Teaching) studying in the fall semester of the 2022-2023 academic year at a state university in the Aegean Region. The sampling method consists of the appropriate sampling method. A total

of 342 teacher candidates were included in the sample after removing the forms with outliers and filled in incompletely. Demographic data on teacher candidates are presented in Table 1.

Table 1. *Demographic Variables*

Demographic Features	Groups	f	%
Grade Points Averages*	2-2.5	46	13.5
	2.51 – 3.5	267	78.1
	3.51 - 4	29	8.5
	Total	342	100.0
Gender	Female	251	73.4
	Male	91	26.6
	Total	342	100.0
Department	Preschool	129	37.7
	Classroom Education	66	19.3
	Social Studies	68	19.9.
	Turkish Education	79	23.1
	Total	342	100.0
Class	2nd Grade	108	31.6
	3rd Grade	113	33.
	4th Grade	121	35.4
	Total	342	100.0
Family Income*	Up to 5500	89	26.
	5501 and above	233	68.1
	Total	322	94.2
Student Revenue*	850	114	33.3
	851 and above	195	57
	Total	309	90.4
Quality of Family Residence	Village	42	12.3
	District	62	18.1
	Province	100	29.2
	Metropolitans	137	40.1
	Total	341	99.7

*Relevant variables were not grouped during the analysis, but they are shown in this table as a group in order to give an idea about the data.

Data Collection Tools

In the selection of the scale, attention was paid to the fact that the scales were developed with the participation of a similar sample (teacher candidates and university students), and that the internal reliability coefficients were 70% and above. Teacher Self-Efficacy Scale (Cronbach's Alphas .93 for original scale) adapted to Turkish by Çapa, Çakıroğlu and Sarıkaya (2005), Self-regulatory Learning Skills Scale (Cronbach's Alphas .91 for original scale) developed by Turan (2009), and Metacognitive Awareness Scale (Cronbach's Alphas .75 for original scale) developed by Fırat Durdukoca and Arıbaş (2019) were used as data collection tools. The general grade point averages of the teacher candidates were collected from the teacher candidates through forms. The Teacher Self-Efficacy Scale consists of 24 items. The lowest 24 points and the highest 120 points can be obtained from the scale. The Self-regulatory Learning Skills Scale consists of 41 items. The lowest score of 41 and the highest score of 205 can be obtained from the scale. The Metacognitive Awareness Scale consists of 18 items. The lowest score can be obtained from the scale and the highest score can be obtained from 90 points.

Data Analysis

As a result of the data being close to normal distribution, parametric statistical techniques were used in the analysis of the data. Data on the normality assumption are presented in Table 2. For the assumption of normality, kurtosis and skewness values were also checked (Table 3). Accordingly, independent groups t-test was used for the gender, one-way analysis of variance (ANOVA) was used for the variables of the quality of the family residence, department, and class, Pearson correlation coefficient was used for the variables of family and student income, and artificial neural network analysis was used for the estimation of the general grade average according to the scale scores. In addition, Scheffe test was used to interpret ANOVA results because the number of samples was not equal, and it made it possible to compare all possible combinations that could be created between the groups (Gündoğdu, 2014; Kayri, 2009).

Table 2. *Values Obtained for Normality Assumption*

The scales	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistical Value	df	p	Statistical Value	df	p
Self-efficacy	.060	342	.005	.994	342	.225
Self-Regulatory Learning	.050	342	.039	.995	342	.335
Metacognitive Awareness	.048	342	.054	.995	342	.290

According to Table 2, the data showed normal distribution according to the Shapiro-Wilk test, while the data obtained from the self-efficacy and self-regulation scale did not show normal distribution according to the Kolmogorov-Smirnov test.

Table 3. *Kurtosis and Skewness Values*

The Scales	For the Whole Sample	Statistical Value	S.E.	Calculated Value
Self-efficacy	Skewness	-.118	.132	.893
	Kurtosis	.071	.263	.269
Self-Regulatory Learning	Skewness	-.046	.132	-.348
	Kurtosis	.004	.263	.015
Metacognitive Awareness	Skewness	-.084	.132	636
	Kurtosis	.123	.263	.467

When Table 3 is examined, it is seen that the values calculated by dividing the statistical value by the standard error are in the range of ± 1.96 and are close to the normal distribution. The artificial neural network, which is another analysis used in the study, was established with feed-forward back propagation, single hidden layer, 27 hidden cells, momentum weights slope drop adaptation learning and Levenberg-Marquardt learning algorithm.

Validity and Reliability

The reliability of the data obtained was examined by calculating the internal consistency coefficient (Cronbach's Alphas for self-efficacy .90, for self-regulatory learning .91 for metacognitive awareness .80). The internal consistency coefficient of 70 and above indicates that the data are sufficient for reliability in general (Büyüköztürk, 2016). In addition, it was paid attention that the measurement tools used in the research were developed with the contributions of a similar sample (teacher candidates, university students). Since the volunteering of the participants is also a variable that can affect reliability and validity (Yıldırım and Şimşek, 2008), data were collected only from volunteer teacher candidates. Forms showing extreme value quality, which is another situation that may affect the results, were not included in the study.

Findings

In the findings section, descriptive statistics of teacher candidates' self-efficacy, self-regulatory learning and metacognitive awareness are presented. Then, the results of the analysis of demographic variables are given. Finally, findings related to the artificial neural network are presented.

The general distribution of the scores obtained by the teacher candidates from self-efficacy, self-regulatory learning and metacognitive awareness scales is presented in Table 4.

According to the level ranges obtained by dividing the difference between the lowest score that can be obtained and the highest score that can be obtained by 5 (very low, low, medium, high, very high) and starting from the lowest score that can be obtained, it can be said that teacher candidates' self-efficacy, self-regulatory learning and metacognitive awareness are at a high level. Table 5 presents the t-test results for the independent samples made to look at the significant difference between the groups for the gender variable.

When Table 5 is examined, it is seen that there is no significant difference between the groups according to the scores of the scales for the gender variable. The results of the one-way analysis of variance conducted to examine the significant difference between the groups for the department variable are presented in Table 6.

When Table 6 is examined, it is seen that there is no significant difference between the groups according to the scores of the scales for the department variable. The results

Table 4. *General Distribution of Scores*

The scales	Lowest Score	Maximum score	Average	Standard Error	Standard Deviation
Self-Efficacy (SQ)	24	120	92.9035	.56320	10.41539
Self-Regulatory Learning (SR)	41	205	157.4123	.99250	18.35451
Metacognitive Awareness (MA)	18	90	66.5819	.52749	9.75495

Table 5. *Analysis Results for Gender Variable*

Score	Group	N	M	Sd	$S.E._M$	t-test		
						t	df	p
SQ	Female	251	92.5936	10.35230	.65343	-.914	340	.362
	Male	91	93.7582	10.59805	1.11098			
SR	Female	251	158.3347	18.54140	1.17032	1.547	340	.123
	Male	91	154.8681	17.67937	1.85330			
MA	Female	251	66.4582	9.49870	.59955	-.389	340	.698
	Female	91	66.9231	10.47667	1.09825			

Table 6. *Analysis Results for Department Variable*

	Values				ANOVA Results				
P.	Group	N	M	Sd		Sum of Squares	df	Mean Square	F	p
SQ	Pre-school	129	91.2713	10.458	Between	699.481	3	233.160	2.171	.091
	Classroom	66	93.424	11.884	Inside	36292.335	338	107.374		
	Social	68	95.102	9.132	Total	36991.816	341			
	Turkish	79	93.240	9.821						
SR	Pre-school	129	155.007	19.371	Between	1592.820	3	530.940	1.584	.193
	Classroom	66	160.727	17.129	Inside	113286.048	338	335.166		
	Social	68	158.750	15.347	Total	114878.868	341			
	Turkish	79	157.417	19.741						
MA	Pre-school	129	65.279	9.436	Between	463.090	3	154.363	1.631	.182
	Classroom	66	67.636	9.704	Inside	31986.118	338	94.633		
	Social	68	68.161	9.453	Total	32449.208	341			
	Turkish	79	66.4684	10.426						

of the one-way analysis of variance conducted to examine the significant difference between the groups for the class variable are presented in Table 7.

When Table 7 is examined, it is seen that there is a significant difference between the groups according to the scores of the scales for the class variable. Scheffe test results performed to determine which groups differ according to the grade variable are presented in Table 8.

When Table 8 is examined, it is seen that there is a significant difference in self-efficacy scores between 3rd grades and 2nd grades in favor of 3rd graders. It is seen that there is a significant difference in self-regulatory learning scores between 4th grades and 2nd grades in favor of 4th grades. In metacognitive awareness scores, it is seen that there is a significant difference between 3rd and 4th grades and 2nd grades in favor of 3rd and 4th grades. The results of the one-way analysis of variance conducted to examine the significant difference between the groups for the quality of the place where the family lives are presented in Table 9.

When Table 9 is examined, it is seen that there is no significant difference between the groups according to the scores of the scales for the quality of the place where the family lives. The Pearson correlation coefficient results to examine the relationship between the family income variable and the scores of the scales are presented in Table 10.

Table 7. *Analysis Results for the Class Variable*

	Values				ANOVA Results					
P.	Group	N	M	Sd		Sum of Squares	df	Mean Square	F	p	η^2
SQ	2	108	91.129	11.229	Between	853.482	2	426.741	4.003	.019	.023
	3	113	95.000	10.618	Inside	36138.334	339	106.603			
	4	121	92.528	9.136	Total	36991.816	341				
SR	2	108	153.351	19.976	Between	2633.124	2	1316.562	3.976	.020	.023
	3	113	158.911	18.066	Inside	112245.745	339	331.108			
	4	121	159.636	16.580	Total	114878.868	341				
MA	2	108	63.342	10.084	Between	1680.089	2	840.044	9.255	.000	.051
	3	113	68.407	9.040	Inside	30769.119	339	90.764			
	4	121	67.768	9.457	Total	32449.208	341				

Table 8. *Scheffe Test Results*

Score	Groups (i)	Groups (j)	M_i - M_j	$S.E._M$	p
SQ	3rd Grade	2nd Grade	3.87037	1.38941	.022
SR	4th Grade	2nd Grade	6.28451	2.40879	.034
MA	3rd Grade	2nd Grade	5.06449	1.28204	.000
	4th Grade	2nd Grade	4.42600	1.26116	.002

Table 9. *Analysis Results for the Variable of the Quality of Family Residence*

	Values				ANOVA Results				
P.	Group	N	M	Sd		Sum of Squares	df	Mean Square	F	p
SQ	Village	42	91.785	8.469	Between	467.522	3	155.841	1.445	.230
	District	62	93.354	11.003	Inside	36357.305	337	107.885		
	Province	100	91.520	11.124	Total	36824.827	340			
	Metropolitans	137	94.146	10.065						
SR	Village	42	157.785	16.503	Between	228.129	3	76.043	.225	.879
	District	62	158.983	19.054	Inside	114003.062	337	338.288		
	Province	100	156.570	18.945	Total	114231.191	340			
	Metropolitans	137	157.386	18.221						
MA	Village	42	65.928	7.930	Between	41.898	3	13.966	.145	.933
	District	62	66.161	10.915	Inside	32404.800	337	96.157		
	Province	100	66.780	10.029	Total	32446.698	340			
	Metropolitans	137	66.839	9.624						

Table 10. *Analysis Results for Family Income Variable*

Score	Statistics	Family Income
SQ	Pearson Correlation Coefficient	.026*
SR	Pearson Correlation Coefficient	-.033*
MA	Pearson Correlation Coefficient	-.049*

p>.05, *N*=322

When Table 10 is examined, it is seen that there is no significant relationship between the family income variable and the scores of the scales. The results of the Pearson correlation coefficient to examine the relationship between the student income variable and the scores of the scales are presented in Table 11.

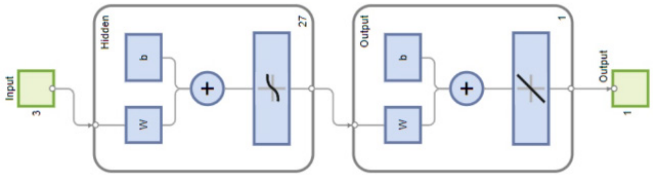
Table 10. *Analysis Results for Student Income Variable*

Score	Statistics	Student Income
SQ	Pearson Correlation Coefficient	.101*
SR	Pearson Correlation Coefficient	.003*
MA	Pearson Correlation Coefficient	-.029*

p>.05, *N*=309

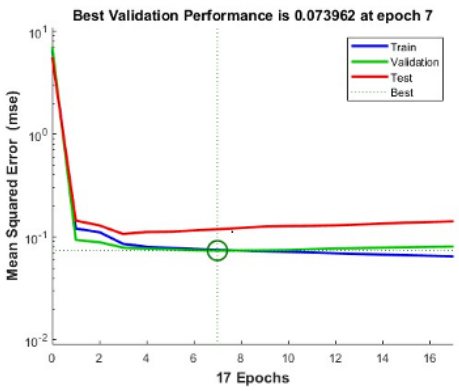
When Table 11 is examined, it is seen that there is no significant relationship between the student income variable and the scores of the scales. The artificial neural network model used in the research is shown in Figure 1.

Figure 1. *Artificial Neural Network Model*



When Figure 1 is examined, it is seen that the artificial neural network model established with the Levenberg-Marquardt learning algorithm has a structure with feed-forward back propagation, single hidden layer, 27 hidden cells, 3 inputs and one output. The performance graph showing the best mean square error (MSE) value obtained for the artificial neural network created is shown in Figure 2.

Figure 2. *Performance Values of Artificial Neural Network*



When Figure 2 is examined, it can be seen that the best verification performance is the one reached in the 7th epoch .073962. The learning status graph of the created network is presented in Figure 3 and the distribution of error values is presented in Figure 4.

Figure 3. *Learning Status Chart*

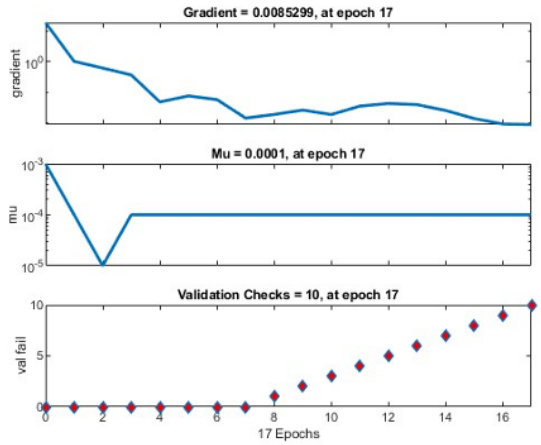
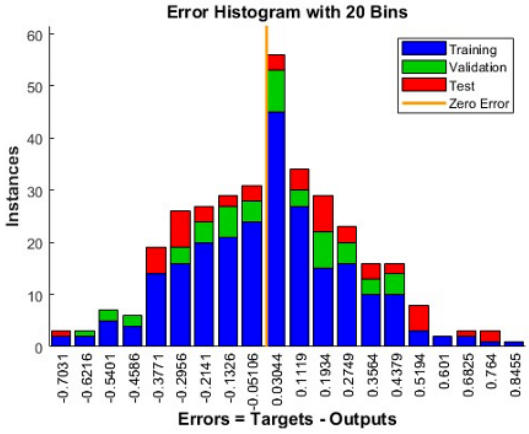
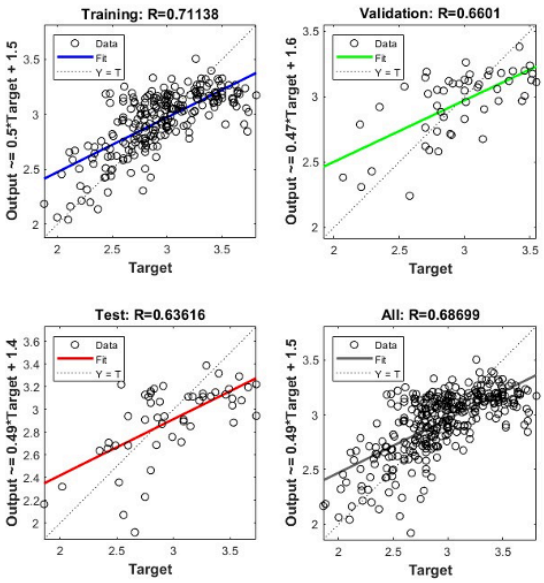


Figure 4. *Distribution of Errors*



When Figure 3 is examined, it is understood that the slope line continuously decreases, but the error in the verification control starts to increase after the 7th epoch, so the best performance is achieved at this point. When Figure 4 is examined, it is seen that the majority of the error values consisting of the difference between the actual data and the estimation data 03044. The estimated values of the established artificial neural network are shown in Figure 5.

Figure 5. *Artificial Neural Network Correlation Chart*



When Figure 5 is examined, it is seen that the single hidden layer, 27 hidden cell artificial neural network model for education .71, for verification .66, for the test .64 for the whole model .69 correlation value. When the correlation values of the validation and test data and the proximity of the total correlation value are examined, it can be said that the model created is a balanced model. MSE values of the model were found to be .075, for verification .074, for testing .12 and for the whole model .082. According to the model, self-efficacy, self-regulatory learning, and metacognitive awareness scores explain approximately 47% of the total variance of academic performance.

Conclusion and Discussion

As a result of the research, it was concluded that the self-efficacy, self-regulatory learning, and metacognitive awareness scores of the teacher candidates did not change statistically significantly according to the gender variable. When the literature is examined in the context of the gender variable, it is seen that there are studies supporting the finding obtained in this study within the scope of metacognitive awareness (Al Huseini, 2015; Bakioğlu, Alkış Küçükaydın, Karamustafaoğlu, Uluçınar Sağır, Akman, Ersanlı and Çakır, 2015; Çikrıkci and Odacı, 2013; Deniz, Küçük, Cansız, Akgün and İşleyen, 2014; Ekici and Uslu, 2020; Hashempour, Ghonsooly and Ghanizadeh, 2015; Özsoy and Günindi, 2011; Öztürk and Açıl, 2020; Jaleel and Premachandran, 2016; Rahman, Jumani, Chaudry, Chisti and Abbasi, 2010; Sezgin Memnun and Akkaya, 2009; Vianty, 2007; Zakaria, Yazid and Ahmad, 2009; Zulkiply, 2006), within the scope of self-regulation (Gömleksiz and Demiralp, 2012; Hashempour, Ghonsooly and Ghanizadeh, 2015; Karaoğlu and Pepe, 2020; Saracaloğlu, Karademir, Dursun, Altın and Üstündağ, 2017), and within the scope of self-efficacy (Dagar and Gill, 2019; Hampton and Mason, 2003; Kumar and Lal, 2006). However, contrary to this study, there are also studies showing that gender is effective within the scope of metacognitive awareness (Belet and Güven, 2011; Bidjerano, 2005; Bulut, 2018; Öztürk and Serin, 2020; Tunca and Alkın-Şahin, 2014), self-regulatory learning (Bidjerano, 2005; Bozpolat, 2016; Güler, 2015; Zimmerman and Martinez-Pons, 1990), and self-efficacy (Demirtaş Cömert and Özer, 2011; Huang, 2013; Saracaloğlu, Karademir, Dursun, Altın and Üstündağ, 2017; Tømte and Hatlevik, 2011). Observing different results in the gender variable in the context of dependent variables may be due to the fact that the sociocultural structure (Huffman, Whetten and Huffman, 2013; Jain, Tiwari and Awasthi, 2018; Vatandaş, 2007), in which the sample in which the research was conducted has a different personal and characteristics (Pintrich, 2004) or the cultural prejudices (Pajares, 2002) of women and men on the gender basis. In addition, as Huang points out (2013) in the example of self-efficacy, it should be taken into consideration that differences occur according to gender depending on different life periods.

When the literature is examined in the context of the department variable, it is seen that there are studies supporting the finding obtained in this study within the scope of metacognitive awareness and its sub-dimensions (Bakioğlu, Alkış Küçükaydın, Karamustafaoğlu, Uluçınar Sağır, Akman, Ersanlı and Çakır, 2015; Bedir, 2017; Özturan Sağırlı, Baş and Bekdemir, 2020), within the scope of self-regulation and its sub-dimensions (Aybek and Aslan, 2017) and within the scope of self-efficacy (Çakır, Kan and Sünbül, 2006). However, contrary to this study, there are also studies showing that the department variable is effective within the scope of metacognitive awareness and its sub-dimensions (Bedir, 2017), within the scope of self-regulation and its sub-dimensions (Aybek and Aslan, 2017; Gömleksiz and Demiralp, 2012), and within the scope of self-efficacy (Çakır, Kan and Sünbül, 2006; Demirtaş Cömert and Özer, 2011; Gürbüztürk and Şad, 2009; Ilıman, Arslan and Aslan, 2019). As a result of this research, it was concluded that self-efficacy, self-regulatory learning, and metacognitive awareness scores of teacher candidates did not change statistically significantly according to the department variable.

As a result of the research, it was concluded that the self-efficacy, self-regulatory learning, and metacognitive awareness scores of the teacher candidates did not change statistically significantly according to the quality of family residence. When the literature is examined in the context of the place variable experienced with the family, it is seen that there are studies supporting the finding obtained in this study within the scope of metacognitive awareness (Balasubramanıam, 2017; Jagadeeswari and Chandrasekaran, 2014; Jaleel and Premachandran, 2016), within the scope of self-regulatory learning (Chen and Wu, 2021) and within the scope of self-efficacy (Turan, Karaoğlu, Kaynak and Pepe, 2016). However, contrary to this study, there are also studies showing that the settlement variable is effective within the scope of metacognitive awareness (Bakkaloglu, 2020), within the scope of self-regulatory learning (Güler, 2015), and within the scope of self-efficacy (Arslan, 2019; Ilıman, Arslan and Aslan, 2019; Korkut and Babaoğlan, 2012; Sezer, İşgör, Özpolat and Sezer, 2006).

It was determined that there was no significant relationship between family and student income variables and self-efficacy, self-regulatory learning, and metacognitive awareness scores. When the literature is examined in the context of income variable, it is seen that there are studies supporting the finding obtained in this study within the scope of metacognitive awareness (Jagadeeswari and Chandrasekaran, 2014; Sarpkaya, Arık and Kaplan, 2011), within the scope of self-regulatory learning (Güler, 2015; Ülker, 2019) and within the scope of self-efficacy (Arslan, 2019; Dönmez and Uslu, 2014). However, contrary to this study, there are also studies showing that the income variable is effective within the scope of metacognitive awareness (Karaduman and Erbaş, 2017; Saban, 2008), self-regulatory learning (Ülker, 2019), and self-efficacy (Ilıman, Arslan and Aslan, 2019).

Within the scope of this research, it was observed that self-efficacy, self-regulatory learning, and metacognitive awareness scores changed significantly in favor of upper classes only in the class variable. Considering that metacognitive awareness makes the learning process better in strategic decisions and planning for students (Victor, 2004), and that academic performance increases with the development of metacognitive skills (Al Huseini, 2015; Çikrıkci and Odacı, 2013), it can be interpreted that students make more strategic decisions and plan better as the grade level increases. When the literature is examined in the context of the class variable, it is seen that there are studies similar to the findings obtained in this study within the scope of metacognitive awareness (Belet and Güven, 2011; Ekici and Uslu, 2020; Kurtuluş and Öztürk, 2017; Mert and Baş, 2019; Özsoy and Günindi, 2011; Özturan Sağırlı, Baş and Bekdemir, 2020; Sezgin Memnun and Akkaya, 2009), self-regulatory learning (Aybek and Aslan, 2017; Çelik Ercoşkun and Gündoğdu, 2020; Güler, 2015; Özturan Sağırlı, Çiltaş, Azapağası and Zehir, 2010; Taşkapı, 2015) and self-efficacy (Çelik Ercoşkun and Gündoğdu, 2020; Saracaloğlu, Karademir, Dursun, Altın and Üstündağ, 2017). In addition, when the findings are examined in detail, it is observed that in some of the mentioned studies (Çelik Ercoşkun and Gündoğdu, 2020; Taşkapı, 2015) the scores differ significantly

in favor of lower classes. However, contrary to this study, there are also studies showing that the class variable is not effective within the scope of metacognitive awareness (Çikrıkci and Odacı, 2013; Deniz, Küçük, Cansız, Akgün and İşleyen, 2014; Öztürk and Açıl, 2020; Saban, 2008), self-regulatory learning (Karaoğlu and Pepe, 2020; Saracaloğlu, Karademir, Dursun, Altın and Üstündağ, 2017), and self-efficacy (Palavan and Açar, 2015). The differences in the literature with the findings obtained in this study may be due to the possible mediating or regulatory role of variables such as age (Huang, 2013), academic climate (Abd-Elmotaleb and Saha, 2013), effort regulation, deep processing strategies and goal orientation (Honicke and Broadbent, 2016).

In the context of the relationship between self-efficacy, self-regulatory learning and metacognitive awareness variables and academic grade point average, it is possible to see the studies in which metacognitive awareness (Al Huseini, 2015; Coutinho and Neuman, 2008; Çikrıkci and Odacı, 2013; Kurtuluş and Öztürk, 2017; Maqsud, 1997; Mert and Baş, 2019; Özturan Sağırlı, Baş and Bekdemir, 2020; Öztürk and Açıl, 2020; Rahman, Jumani, Chaudry, Chisti and Abbasi, 2010), self-regulatory learning (Bozpolat, 2016; DiBenedetto and Zimmerman, 2010; Lindner and Harris, 1993; Turan and Demirel, 2010; Ülker, 2019; Üredi and Üredi, 2005) and self-efficacy (Britner and Pajares, 2001; Coutinho and Neuman, 2008; Dağyar and Şahin, 2020; Hampton and Mason, 2003; Honicke and Broadbent, 2016; Üredi and Üredi, 2005) are determined by academic performance. However, it is also possible to see studies in the literature showing that metacognitive awareness (Belet and Güven, 2011; Chisholm, 1999; Ekici and Uslu, 2020), self-regulatory learning (Çetin, 2015; Karaoğlu and Pepe, 2020) and self-efficacy (Ünlü, Kaşkaya and Kızılkaya, 2017) are not related to academic performance. In this study, it was determined that a balanced artificial neural network model could be created as a result of artificial neural network analysis and a model was formed in which self-efficacy, self-regulatory learning and metacognitive awareness variables explained 47% of the total variance in academic performance. As a matter of fact, it can be inferred from this result that self-efficacy, self-regulatory learning, and metacognitive awareness have significant effects on academic performance.

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