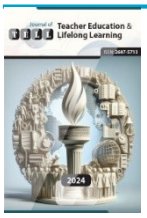

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Investigation of Teacher Candidates' Self-Employability, Responsibility Capability and Perspectives on Scientific Research

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ABSTRACT

The purpose of this study is to investigate the relationship between teacher candidates' perspectives on scientific research and their capacity for self-employment and responsibility. The survey model was implemented in the design of the study. The population of the research is 2347 teacher candidates from the Faculty of Education at Burdur Mehmet Akif Ersoy University. There are 479 teacher candidates in the sample, 370 of them are women and 109 men. Data were gathered online using two different subject-related scales. Aligned with the study's findings, it was concluded that the teacher candidates' self-employability and responsibility capability differs significantly according to the idea of pursuing a master's degree and the grade level. It was also discovered that the perspectives of the teacher candidates on scientific research differed significantly according to gender, the idea of pursuing a master's degree, weighted grade point average, the department they studied and the degree of satisfaction with the department. It was also revealed that there is a low-level positive noteworthy relationship between teacher candidates' self-employability and responsibility capability and their perspectives on scientific research. The present situation has been assessed in light of the research's findings, and ideas for additional work have been suggested.

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INTRODUCTION

Education can be evaluated as a process that starts in the family, expands with the social environment and continues in a planned and programmed way. This is ensured formally in schools and informally throughout life. Education is the ongoing effort done to bring about specific changes in human behavior in terms of personality qualities such as knowledge, skills, understanding, interest, perspective and character (Yıldırım, 1983). It is also the process of creating an intentional modification in the acts of a person through his own life (Ertürk, 2016). Aydın (2009), on the other hand, states that what is meant by education is a more planned, programmed and purposeful process.

Education can also be considered as a system. The state involves a lot of different systems and one of them is the education system. The teacher, the student, and the curriculum make up the three basic parts of the educational system. However, the most crucial and prominent one is the teacher. Because the teacher is the one who will carry the students to the aimed level and make the system useful (Aydın & İşlek, 2021). The purpose of all components in the education system is to increase the qualifications of students so that they can be more creative and productive. For this reason, there is a need for more qualified teachers, modern teaching programs suitable for the changing conditions of the day, physical environments, management and eager students (Ministry of National Education [MNE], 2006). Therefore, teacher candidates should be provided with an efficient teaching profession, in which they will apply their experiences and knowledge throughout their professional careers (Baki & Gökçek, 2007).

In recent years many university graduates do not feel ready for the profession despite having studied for a long time. Research shows that people with a university degree are inadequate especially in practice-based skills and acquisitions. Communication, analytical thinking, troubleshooting, professional ethics, cooperation and collaboration, technology use, leadership, and project management are among the competencies involved (Kanmaz, 2021).

The importance of abilities like critical thinking, troubleshooting, mathematical literacy, taking initiative, and self-learning, which are expressed as 21st century skills, have increased recently. One of the organizations that classify 21st century skills is Battelle for Kids. The basic mission of this non-profit organization is defined as developing the 21st century skills of every student. The classification made by Battelle for Kids within the scope of the Partnership for 21st Century Learning (P21) study is shown in Table 1.

As seen in Table 1, when the skills determined by P21 (2019) within the framework of the 21st century are examined, it is acknowledged that people require a variety of abilities to keep up with modern time. Among the 21st century skills that an individual needs to develop are important competencies such as types of thinking, problem-solving skills, and various types of literacy. It is also clear that individuals are obliged to accomplish their own responsibilities while trying to adapt to the rapidly changing world. The basic principles of taking initiative and self-management skills, which are given under life and career skills, are included in P21 (2019) under the heading of management and independent work. According to these principles, individuals are expected to set a goal for themselves, use their time efficiently in line with this goal and take initiative of their works. In this context, the need for the person to gain the ability to manage their own learning process without the need for any control mechanism arises (P21, 2019).

Table 1. *Classification of 21st Century Skills*

Learning and Renewal Skills	Information, Media and Technology Skills	Life and Career Skills
Creativity	Information literacy	Flexibility and adaptability
Innovation	Media literacy	Taking initiative and self-management
Critical Thinking	Digital literacy	Social and intercultural productivity
Problem solving		Leadership and responsibility
Communication		

Collaboration

Source: Battelle for kids; Partnership for 21st century [P21], 2019.

Self-learning skill, among the skills of the 21st century, can be defined as “an individual's following his/her own learning process”. This skill is extremely important for teachers and prospective teachers who implement lifelong learning and self-directed learning skills, education policies and training programs. Because people should be capable of organizing, executing and handling. (Arnandho & Sutheejariyawattana, 2022).

Students with high ability to work independently do not need another person during learning (Basic Education Program, 2013). Teachers, who are expected to provide students with the capacity for self-employment, should be competent enough to transfer this to their students (Schleicher, 2012). With Turkey's entry into the Bologna process in 2001, the National Qualifications Framework for Higher Education in Turkey was determined in 2010. Within the framework of these competencies, the self-employability and responsibility capability includes some skills. Being able to carry out an advanced study in the field independently, assuming accountability both as a person and as a team member to resolve unexpectedly complicated situations in the field are some examples (Council of Higher Education [CHE], 2022). It is seen that the 21st century skills determined within the scope of Partnership for 21st century and the competencies required to be acquired in Turkey Higher Education Qualifications Framework are similar. Accordingly, it can be said that a teacher should be able to work independently and take responsibility in order to be a role model for the student as well as being responsible for providing the student with the necessary knowledge and skills.

Responsibility is a virtue that can be observed directly, transformed into behavior, started to be given from an early age, has a crucial part in the lives of individuals and continues until death (Sezer et al. 2017). Responsibility is the active side of morality and is described as a person’s being attentive to himself and others, performing his duties, taking part in the social process and making efforts to solve problems (Lickona, 1991), approving the results and effects of the choices made (Popkins, 1987). While Glasser (1990) defines the responsible individual as a person who can meet their own needs without preventing other people from meeting their own needs, Yavuzer (1998) describes it as a person who performs the duties in accordance with his age, gender and developmental level from an early age. One of the objectives of the education is to develop a sense of responsibility in order to ensure that individuals can maintain their existence in a harmonious manner in the society and be accepted (MNE, 2006).

Raising individuals with the capacity to generate new information and to think critically, creatively, and scientifically is among society's top priorities. For this reason, countries that want to have a developed society care about the development of individuals who question, have different perspectives and express themselves comfortably (Erdem, 2012). It is possible to say that teachers have the most responsibility in the process of raising the desired human type in the education system (Korkmaz et al., 2011). Because one of the vital targets of education is to improve the scientific perspectives of individuals (Büyüköztürk, 1999). While perspective is defined as a phenomenon that is assumed to affect an individual's behaviors and decisions (McCoach et al., 2013), scientific perspective is expressed as thoughts and behaviors that facilitate problem solving, producing knowledge, researching and learning (Olasehinde & Olatoye, 2014). In line with these statements, it is understood that students are expected to grow a wide perspective to scientific studies, especially with the contribution of teachers in the education process they receive. It is important for students with scientific perspectives to be competent on how to access information instead of getting information ready.

The methods developed or adopted by individuals in their own learning processes and the skills they have are described and examined in different ways by researchers. These methods or skills are defined as study strategies by Deryakulu (2004), study habits by Hotaman (2009), self-learning skills by Abalı Öztürk et al. (2017), and independent research skills by Alanoğlu and Doğan (2021). According

to the literature review, it is seen that many studies have been conducted on the various skills, perceptions, perspectives and opinions of teacher candidates. Recently, it has been determined that teacher candidates have been studied especially on teacher competencies and 21st century skills (Başbay & Bektaş, 2010; Çelik et al., 2019; Tuğluk & Kürtmen, 2018; Yavuz et al., 2015). Additionally, it is evident that there are also studies on the perspectives of teachers and teacher candidates on scientific studies (Korkmaz et al., 2011; Dombaycı & Ercan, 2017; Baykara, 2019). There are also studies on teachers' perception of responsibility or their ability to raise awareness of responsibility (Sezer et al., 2017; Yurtal & Yontar, 2006). It is also seen that concepts such as independent work, taking responsibility and scientific research skills are mostly examined within the scope of 21st century skills (Ananiadou & Claro, 2009; Karakoyun & Lindberg, 2020; Kivunja, 2014; Pipere & Salite, 2006; Sulaiman & Ismail, 2020; Urbani et al., 2017).

In the light of the scope of the study and the literature review it is aimed to find out teacher candidates' self-employability and responsibility capability. It is also expected to determine teacher candidates' perspectives on scientific research. Finally, the relationship between self-employability and responsibility capability and perspectives on scientific research of teacher candidates is examined. Based on these problems, answers to the succeeding questions were sought

1. What is the level of teacher candidates' self-employability and responsibility capability?

2. Do teacher candidates' self-employability and responsibility capability show a significant difference according to gender, department, class, weighted grade point average, idea of getting a master's degree, and satisfaction with the department?

3. What is the level of teacher candidates' perspectives on scientific research?

4. Do teacher candidates' perspectives on scientific research differ significantly according to gender, department, class, weighted grade point average, the idea of pursuing a master's degree, and their satisfaction with the department?

5. Is there a noteworthy association between teacher candidates' self-employability and responsibility capability and their perspectives on scientific research?

METHOD

Research Design

One of the descriptive research models, the survey model, was applied in this study. A study strategy known as the survey model seeks to show the previous or current situation as it actually is. The research's subject's events, people, or things are attempted to be described exactly as they are. There is no attempt to affect or alter them in any way (Karasar, 2016). Due to the nature of this research, the relationship between teacher candidates' self-employability, taking responsibility and their perspectives on scientific research was tried to be described by using the scanning model.

Research Sample

The universe of this study involves a total of 2347 prospective teachers from different departments at the Faculty of Education of Burdur Mehmet Akif Ersoy University. The universe is the whole of the elements that the results of the research are intended to be generalized (Büyüköztürk et al., 2013). Since participation in the study was voluntary, the entire population could not be reached. 479 teacher candidates make up the study's sample, including 370 women and 109 men selected by convenient sampling method. As the research was conducted in a short period of time, convenient sampling method was preferred. Since there are constraints on resources such as time, money, and effort, appropriate (accidental) sampling refers to the selection of the sample from readily available and applicable units (Balcı, 2009). Information on the distribution of teacher candidates partaking in the study is given in Table 2.

Table 2. *Distribution of Teacher Candidates Partaking in the Research*

		f	%
Gender	Female	370	77.2
	Male	109	22.8
Grade	1	95	19.8
	2	95	19.8
	3	169	35.3
	4	120	25.1
Department	Mathematics	57	11.9
	Social Sciences	143	29.9
	Turkish	24	5.0
	English	35	7.3
	Fine Arts	48	10.0
	Basic Education	31	6.5
	Pre-School	101	21.1
	Guidance and Counselling	40	8.4
Weighted Grade Point Average (GPA)	2.50-2.99	83	17.3
	3.00-3.49	207	43.2
	3.50-4.00	189	39.5
Idea of Getting Master's Degree	Yes	292	61.0
	No	187	39.0
Satisfaction with the Department	Yes	337	70.4
	No	35	7.3
	Partially	107	22.3
Total		479	100

When Table 2 is examined, 370 (77.2%) of the teacher candidates partaking in the research are female and 109 (22.8%) are male. Looking at the distribution of by grades, 95 (19.8%) from 1st grades, 95 (19.8%) from 2nd grades, 169 (35.3%) from 3rd grades and 120 (25.1%) from 4th grades teacher candidates participated. According to the departments of teacher candidates, 143 (29.9%) from the Social Studies department, 101 (21.1%) from the Preschool Department, 57 (11.9%) from the Elementary Mathematics Department, 48 (10%) from the Fine Arts Department, 40 (8.4%) from the Guidance Department, 35 (7.3%) from the Department of English, 31 (6.5%) from the Department of Classroom Teaching, and 24 (5%) from the Turkish department took part in this study.

When the weighted grade point averages of the prospective teachers are observed, it is realized that 207 (43.2%) students are in the range of 3.00-3.49, 189 (39.5%) students are in the range of 3.50-4.00, and 83 (17.3%) students are in the range of 2.50-2.99. None of the teacher candidates participated in the study had a weighted average score below 2.50. In addition, while the number of teacher candidates who are considering a master's degree is 292 (61%), the number of those who do not is 187 (39%). According to the satisfaction of the teacher candidates with their department, it is seen that 337 teacher candidates (70.4%) are satisfied with the department, 35 candidates (7.3%) are not satisfied with the department, and 107 candidates (22.3%) are partially satisfied with the department.

Resarch Instrument and Processes

In this research, three distinct data collection tools were employed. One of them is the Personal Information Form created by the researchers. This personal information form includes gender, class, weighted grade point average, department, the idea of pursuing a master's degree and the degree of satisfaction with the department.

The Self-Employability and Responsibility Capability Scale

For the purpose of collecting data about the abilities of teacher candidates' independent work and taking responsibility, the The Self-Employability and Responsibility Capability Scale (SERC) developed by Sıvacı and Kuzu (2017) was used. 20 items in this 5-point Likert-type scale were scored as "1= I'm not competent at all, 2= I am not competent, 3= I am moderately competent, 4=I am competent, 5=I am very competent". The Kaiserk-Meyer-Olkin (KMO) coefficient was calculated to test the size of the sample and

the KMO value was found to be .915. The significance value was found as p<.01 with Bartlett's test. Moreover, the total variance explained was found to be 46.193%. Therefore, a scale with high validity and reliability was obtained and with this scale, the competency levels of pre-service teachers to work independently and take responsibility were examined in terms of various variables (Sıvacı and Kuzu, 2017).

The cronbach alpha value was computed as .931 based on the results of the reliability test. If the Cronbach alpha number has a value in the range of $0.80<\alpha<1.00$, the measuring instrument employed is regarded as credible. (Tezbaşaran, 2008).

Table 3. *The Results of Self-Employability and Responsibility Capability Scale Reliability Analysis*

Scale	α
Self-Employability and Responsibility Capability Scale	.931

Attitude Scale Toward Scientific Research

The "Attitude Scale Toward Scientific Research (ASTSR)" developed by Korkmaz et al. (2011) was used to determine the perspectives of prospective teachers on scientific research. According to the results of the explanatory factor analysis, the inventory is composed of four factors. When the factor loads, factor eigenvalues and detected variance rates are considered; it can be confirmed that the inventory has structural validity (Korkmaz et al., 2011). This is a 5-point likert scale based on two main factors of 'negative attitude towards scientific research' and 'positive attitude towards scientific research'. These two main factors have four sub-dimensions of "reluctance to assist researcher", "negative perspective on research", "positive perspective on research" and "positive perspective on the researcher". Table 4 contains the information about the reliability analysis of the scale.

Table 4. *The Results of Attitude Scale Toward Scientific Research Reliability Analysis*

Scale	Sub-dimensions	α
Attitude Scale Toward Scientific Research	Reluctance to assist researcher	.883
	Negative perspective on research	.882
	Positive perspective on research	.861
	Positive perspective on the researcher	.879
	ASTSR Total	.828

As seen in Table 4, it is obvious that the Attitude Scale toward Scientific Research used in the research has sufficient Cronbach alpha values both in all sub-factors and in general. According to these results, it is understood that both scales in the study are reliable.

Data Analysis

The scores of participants gained from Self-Employability and Responsibility Capability Scale express the competency level of the participants. As the score obtained increases, the level of self-employability and responsibility capability also increases. In the Attitude Toward Scientific Research Scale, the increase in the scores gotten from scale shows that the negative perspective increases for the first (reluctance to assist researchers) and second (Negative Perspectives on Research) factors, while the third (Positive Perspective on Research) and fourth (Positive Perspective on Researchers) factors show that positive perspective increases. The first two factors and the last two factors are inversely proportional to each other. All of the items in the first and second factors are negative statements, while rest of the statements are positive. Therefore, high average points gained from the first two factors show negativity, and high scores in the third and fourth factors indicate positivity. Because of this inverse proportionality, calculating a total score for the whole scale is not meaningful and requires separate operations on the factors (Korkmaz et al., 2011:971).

Within the framework of the main purpose of the research, the necessary statistical analyzes were made on the data collected for the sub-problems whose answers were sought, using the SPSS 22 package program. Among the descriptive statistical methods, (f) frequency, (%) percentage and (Γ) arithmetic mean analysis was performed. Mann-Whitney U and Kruskall Wallis H tests, which are non-parametric tests, were

applied to determine the direction of the difference in multiple comparisons. Correlation test was done to find out the association between the ability to self-employability and responsibility capability and the attitude toward scientific research. The interpretation of the results obtained from the scale items was based on the value ranges recommended by Field (2002). These ranges are given in Table 5 and Table 6.

Table 5. *Self-Employability and Responsibility Capability Scale Score Ranges*

Value Range	Self-Employability and Responsibility Capability Scale	Level of competency
1.00 – 1.80	I'm not competent at all	Very low
1.81 – 2.60	I'm not competent	Low
2.61 – 3.40	I'm moderately competent	Medium
3.41 – 4.20	I'm competent	High
4.21 – 5.00	I'm very competent	Very high

Table 6. *Attitude Toward Scientific Research Scale Score Ranges*

Value Range	*Attitude* Toward Scientific Research Scale	Perspective
1.00 – 1.80	I totally disagree	Very low
1.81 – 2.60	I disagree	Low
2.61 – 3.40	I'm undecided	Medium
3.41 – 4.20	I agree	High
4.21 – 5.00	I totally agree	Very high

Before the collected data of the research were analyzed, the normality test was applied to decide which tests to be done. The normality tests are done separately for each scale. The results of the normality test based on the overall score averages are revealed in Table 7.

Table 7. *Normality Test Results of the Data Obtained from the Scale*

Scales	Factors	Kolmogorov-Smirnov		
		Statistics	df	p
Self-Employability and Responsibility Capability Scale	Self-Employability and Responsibility Capability	.063	479	.000
Attitude Toward Scientific Research Scale	Positive Perspective on Research	.084	479	.000
	Negative perspective on research	.077	479	.000

According to the results of the normality test in Table 7, it is understood that the scores obtained from both Self-Employability and Responsibility Capability Scale and the scores obtained from Attitude Toward Scientific Research Scale do not have a normal distribution. Since the first two and the last two factors in the Attitude Toward Scientific Research Scale measure different perspectives, they were analyzed separately. In this case, it is seen that non-parametric tests should be applied in data analysis.

Ethic

The ethics committee application of the study was made to Mehmet Akif Ersoy University Ethics Committee.

RESULTS

The research's findings will be presented in the sequence specified by the sub-problems in this section. In this regard, the first sub-problem tries to find the level of teacher candidates' self-employability and responsibility capability. The average scores related to the sub-problem are given away in Table 8.

Table 8. *The Level of Teacher candidates' Self-Employability and Responsibility Capability*

	N	$\overline{X}$	Ss
Self-Employability and Responsibility Capability	479	3.88	.56431

When Table 8 is examined, it is seen that the teacher candidates' self-employability and responsibility capability is at 'I'm competent' level (Γ =3.88). Accordingly, it is understood that teacher candidates are diligent about working independently and fulfilling their responsibilities. However, it can be said that the competence level of the teacher candidates, who are expected to be a role model for their students in this

regard, should be at the level of 'I am very competent'.

Table 9. *Mann Whitney U Test Results of Teacher candidates' Self-Employability and Responsibility Capability by Gender*

Gender	N	Mean Rank	Z	p
Female	370	244.66	-1.359	.174
Male	109	224.17		

In order to evaluate the research's findings in relation to the second sub-problem, binary (Mann Whitney U) or multiple (Kruskal Wallis H) comparison tests were applied using non-parametric tests, since the data did not show normal distribution. When the data in Table 9 is analyzed, it is observed that there is no gender-related difference (p<.174) in the self-employability and responsibility capability of teacher candidates. According to this finding, it can be said that gender does not have any effect on the self-employability and responsibility capability.

Table 10. *Mann Whitney U Test Results of Teacher candidates' Self-Employability and Responsibility Capability According to the Idea of Getting Master's Degree*

Idea of Getting Master's Degree	N	Mean Rank	Z	p
Yes	292	255.55	-	.002
No	187	215.72	3.074	

As stated in Table 10, a notable difference has been figured out (p>,002) in support of those considering a master's degree in the self-employability and responsibility capability. Accordingly, it can be thought that teacher candidates who are considering a master's degree have better self-employability and responsibility capability.

Table 11. *Post-Hoc test with Bonferroni Correction Results of Teacher candidates' Self-Employability and Responsibility Capability According to Grade Level*

Grade Level (I)	Grade Level (J)	Mean Difference	p
1	2	-1.80	1.00
	3	-.76	1.00
	4	-3.76	.032
2	1	1.80	1.00
	3	1.03	1.00
	4	-1.96	1.00
3	1	.76	1.00
	2	-1.03	1.00
	4	-2.99	.019
4	1	3.76	.032
	2	1.96	1.0
	3	2.99	.019

According to Table 11, the ability of teacher candidates' self-employability and responsibility capability differs significantly at the grade level. As a result of the analysis, it was understood that this difference was in favor of the 4th grade students. This situation was also determined in favor of senior students against both 2nd and 3rd grade students. Accordingly, it's reasonable to state that as the education level of teacher candidates increases, they are more competent in carrying out independent work and taking responsibility. At this point, it can be thought that the education given at the university supports to the advance of the students' self-employability and responsibility capability.

Table 12. *Kruskal Wallis H Test Results of Teacher candidates' Self-Employability and Responsibility Capability According to Department*

Department	N	Mean Rank	p
Mathematics	57	231.17	
Social Sciences	143	225.76	
Turkish	24	214.23	
English	35	208.39	0.217
Fine Arts	48	262.15	
Basic Education	31	238.97	
Pre-School	101	263.79	
Guidance and Counselling	40	260.76	

When Table 12 is examined, it is evident that teacher candidates' self-employability and responsibility capability does not show a statistically significant difference according to the department they study. Therefore, it can be demonstrated that the branch has no impact on teacher candidates' capacity for responsibility and self-employment.

Table 13. *Kruskal Wallis H Test Results of Teacher candidates' Self-Employability and Responsibility Capability According to Weighted GPA*

Weighted GPA	N	Mean Rank	p
2.50-2.99	83	212.51	
3.00-3.49	207	241.62	.114
3.50-4.00	189	250.29	

According to Table 13, it is understood that teacher candidates' self-employability and responsibility capability does not differ significantly according to the weighted GPA of the teacher candidates. According to these findings, although the teacher candidates with high grade point averages have higher self-employability and responsibility capability, this difference does not seem to be significant. The fact that the weighted GPA of each of the teacher candidates participating in the study is different from each other makes it difficult to make statistical calculations. For this reason, the weighted GPAs of the teacher candidates were analyzed by dividing them into groups of 0.50 points each.

Tablo 14. *Post-Hoc test with Bonferroni Correction Results of Teacher candidates' Self-Employability and Responsibility Capability According to Satisfaction with the Department*

Satisfaction (I)	Satisfaction (J)	Mean Difference	p
Yes	No	.91	1.00
	Partially	4.47	.001
No	Yes	-.91	1.00
	Partially	3.55	.306
Partially	Yes	-4.47	.001
	No	-3.55	.306

According to Table 14, it is understood that teacher candidates' self-employability and responsibility capability differs significantly in terms of their satisfaction with the department. A noteworthy difference is discovered in favor of the teacher candidates who say 'yes' to being satisfied with the department and against the teacher candidates who say 'I am partially satisfied'. According to these findings, the fact that most of the teacher candidates are satisfied with the department they are studying, therefore they are competent in conducting independent studies and taking the necessary responsibilities individually.

The average scores of the teacher candidates contributing to the study on the Attitude Scale toward Scientific Research are given in Table 9. While two of the sub-dimensions in the scale are related to negative perspective, the other two sub-dimensions are related to negative perspective. For this reason, the averages obtained from two factors, positive and negative, are shown instead of total scores.

Table 15. *Teacher candidates' Average Scores on Attitude Toward Scientific Research Scale*

Perspective Toward Scientific Research	N	$\bar{X}$	Ss
Negative Perspective Toward Scientific Research	479	2.38	.70199
Reluctance to assist researchers	479	2.61	.82550
Negative perspective on research	479	2.17	.72014
Positive Perspective Toward Scientific Research	479	3.86	.53860
Positive Perspective Toward Research	479	3.65	.63283
Positive Perspective on Researchers	479	4.11	.65121

In Table 15, it is clear that the negative perspectives of the teacher candidates on scientific research are low (Γ = 2.38), while their positive perspectives are high (Γ = 3.86). Looking at the sub-dimensions, it is understood that the perspectives of the teacher candidates are low in the sub-dimensions of reluctance to assist researchers (Γ =2.61) and Negative perspective on research (Γ =2.17). In the sub-dimensions of positive perspective on research (Γ =3.65) and positive perspective on researchers (Γ =4.11),iIt is apparent that teacher candidates have high degrees of perspective. According to these findings, it is understood that teacher candidates respect science, scientific studies and scientists. At this point, it is possible to predict that teacher candidates will benefit from scientific research-based methods and techniques during their teaching profession and will enable their students to develop positive perspectives on scientific research. Non-parametric double (Mann Whitney U) or multiple (Kruskal Wallis H) comparison tests were applied to analyze the results of the fourth sub-problem as the data did not show normal distribution.

Table 16. *Teacher candidates Perspectives on Scientific Research by Gender Mann Whitney U Test Results*

	Kruskal Wallis			
Grade	Reluctance to assist researchers	Negative perspective on research	Positive Perspective on Research	Positive Perspective on Researchers
Female	225.97	228.54	240.20	248.64
Male	287.62	278.89	239.31	210.68
Z	-4.092	-3.344	-.060	-2.535
p	.000	.001	.952	.011

According to Table 19, teacher candidates' perspectives on scientific research differ significantly by gender it is apparent that there is a significant difference in countenance of male teacher candidates in the "Reluctance to assist researchers" sub-dimension (p>.000) and "Negative perspective on research" (P>.001) referring to negative perspective. According to this result, it is understood that male teacher candidates have a more negative perspective on scientific research. In the "Positive Perspective on Researchers" sub-dimension, it was revealed that there was a significant difference in favor of female teacher candidates (p>,011). According to these findings, it is understood that female teacher candidates have a more positive perspective on scientific studies and scientists than male teacher candidates. In this case, it is possible to say that female teacher candidates pay attention to their studies to be more systematic and regular. Considering that scientific researches are carried out in a certain system and in a planned manner, it's acceptable to state that female teacher candidates will do the teaching profession with the same care.

Table 17. *Teacher Candidates' Perspectives on Scientific Research by Grade Level Kruskal Wallis H Test Results*

	Kruskal Wallis			
Grade	Reluctance to assist researchers	Negative perspective on research	Positive Perspective on Research	Positive Perspective on Researchers
1	244.58	250.49	245.01	219.85
2	248.35	240.36	244.64	275.65
3	220.81	214.34	236.49	244.63
4	256.80	267.55	237.31	221.21
P	.140	.011	.943	.012

According to Table 17, it is clear that teacher candidates' perspectives on scientific research indicate a noteworthy difference in terms of the class variable. This difference was determined in favor of the 4th grade students in the 'Negative perspective on research' sub-dimension, and in favor of the 2nd grade students in the 'positive perspective on researchers' sub-dimension. Accordingly, it is seen that fourth-grade students have a Negative perspective on researches rather than researchers. It can be said that this situation is caused by the fact that senior students are generally used in researches done with teacher candidates. It is understood that those who have the most positive perspectives on researchers are second grade students.

Table 18. *Teacher Candidates Perspectives on Scientific Research by Department Kruskal Wallis H Test Results*

	Kruskal Wallis			
Department	Reluctance to assist researchers	Negative perspective on research	Positive perspective on research	Positive perspective on researchers
Mathematics	221.07	246.67	219.94	235.61
Social Sciences	250.60	275.84	231.48	219.46
Turkish	259.58	196.83	265.65	257.29
English	307.13	278.43	211.66	238.21
Fine Arts	240.46	235.88	259.13	257.01
Basic Education	248.24	233.08	223.23	235.47
Pre-School	209.55	195.36	255.23	244.26
Guidance and Counselling	228.53	217.69	260.08	283.24
P	.026	.000	.376	.293

According to Table 18, the perspectives of teacher candidates on scientific research differ significantly according to the department. It is understood that this difference is on behalf of the English Language Teaching Department teacher candidates in the negative perspective dimensions of the scale. That is to say, it is understood that English teacher candidates have a more negative perspective than others. At this point, it is possible to say that it is necessary to examine why students studying in the English language teaching department have a negative perspective on scientific research. It can be assumed that this fact rises from the nature of the scientific research conducted in that department or the perspectives of the researchers conducting these studies.

Table 19. *Teacher Candidates' Perspectives on Scientific Research According to Their Weighted Grade Point Averages Kruskal Wallis H Test Results*

	Kruskal Wallis			
Weighted GPA	Reluctance to assist researchers	Negative perspective on research	Positive Perspective on Research	Positive Perspective on Researchers
2,50-2,99	277.34	271.20	215.86	219.70
3,00-3,49	240.67	247.34	240.87	238.55
3,50-4,00	222.87	218.26	249.65	250.50
P	.011	.009	.176	.230

According to the data in Table 19, when the weighted grade point averages are taken into account, it is clear that the scores of negative perspectives on scientific research are higher in those with a grade point average of 2.50-2.99. At the same time, it is understood that this difference is statistically significant. Accordingly, the perspectives of teacher candidates with GPA between 2.50-2.99 are more negative on scientific research. Considering the weighted grade point averages, it can be said that the students with low academic achievement levels do not have a positive perspective on scientific research. In other words, it is possible to say that it is not surprising that students with low grade point averages have a negative perspective on scientific research in a university where courses are based on scientific research methods.

Table 20. *Perspectives On Scientific Research According to Teacher candidates' Idea of Getting Master's Degree Mann Whitney U Test Results*

Idea of Getting Master's Degree	Kruskal Wallis			
	Reluctance to assist researchers	Negative perspective on research	Positive Perspective on Research	Positive Perspective on Researchers
Yes	227.59	227.48	273.43	248.41
No	259.38	254.54	187.80	226.86
Z	-2.455	-2.478	-6.630	-1.674
p	.014	.013	.000	.094

Table 20 reveals a considerable difference in favor of applicants who do not plan to pursue a master's degree in terms of the negative perspective. In the dimension of "Positive Perspective on Research", a statistically important difference was found in support of those considering graduate education. According to these findings, it is possible to evaluate it as normal that students who are thinking of doing a master's degree show a positive approach on scientific research. Similarly, it can be said that the perspectives of the students who do not intend to do a master's degree on these researches are negative because they do not have a purpose to carry out scientific research and take part in these researches.

Table 21. *Teacher Candidates' Perspectives on Scientific Research According to the Degree of Satisfaction with the Department Kruskal Wallis H Test Results*

Satisfaction with the Department	Kruskal Wallis			
	Reluctance to assist researchers	Negative perspective on research	Positive Perspective On Research	Positive Perspective On Researchers
Yes	230.73	226.59	251.30	250.85
No	271.46	299.74	253.93	217.59
Partially	258.91	262.70	199.87	213.17
P	.070	.002	.003	.029

According to the information in Table 21, it was determined that the prospective teachers differed statistically significantly in terms of their degree of satisfaction with the department they studied. Accordingly, it is seen that in the negative perspective dimension it is in favor of those who are not satisfied with the department, and in the positive perspective dimension, it is in favor of those who are satisfied with the department. In line with these findings, it is understood that the degree of satisfaction with the department they are studying is directly proportional to the perspectives of teacher candidates on scientific research. In this case, it is probable to state that teacher candidates who enjoy their education are willing to contribute to science and scientists.

Table 22. *Results of Spearman Correlation Analysis Between Self-Employability and Responsibility Capability and Perspective on Scientific Research*

	1		2		3		4		5	
	r	P	*r*	P	*r*	P	*r*	P	*r*	P
1 Self-employability and responsibility capability		-								
2.Reluctance to assist researchers	-.179	.000		-						
3.Negative perspective on research	-.117	.010	.663	.000		-				
4.Positive Perspective on Research	.290	.000	-.257	.000	-.182	.000		-		
5.Positive Perspective on Researchers	.194	.000	-.189	.000	-.286	.000	.408	.000		-

According to Table 22, it is seen that there is a significant but negative correlation between self-employability and responsibility capability, and Negative perspective on research sub-dimensions. It is also understood that there is a low level of positive and significant relationship between self-employability and responsibility capability and positive perspective on research sub-dimensions. In light of this consequence, it may be claimed that as teacher candidates' self-employability and responsibility capability increases, their positive perspective on scientific researches increases as well. Similarly, as teacher candidates' self-employability and responsibility capability decreases, their negative perspective on scientific research increases.

DISCUSSION, CONCLUSION, RECOMMENDATIONS

In the study, it was concluded that the teacher candidates were at the level of 'I am competent' according to the average score of The Self-Employability and Responsibility Capability Scale. Similarly, in the research conducted by Cesur (2018), teacher candidates' self-employability and responsibility capability level was determined as 'I am competent'. Again, in another research on 21st century skills (Shidiq & Yamtinah, 2019), it is understood that the teacher candidates gave high-level positive responses to the statements about personal and social responsibility. In another study on the self -efficacy levels of teachers by Aydın and Kurt (2022), teachers similarly are found to have high levels of self-efficacy. Accordingly, it can be said that teacher candidates will fulfill their responsibilities both individually and, in the group. It can also be concluded that they will not have any problems in reaching the solution on their own by using their strengths.

As a result of the statistical tests, teacher candidates' self-employability and responsibility capability did not indicate a meaningful discrepancy in terms of gender. This result is in line with Sıvacı's (2017) study, which found no apparent gender-related difference was found. Again, in the research of Sulaiman and Ismail (2020) on teacher competencies, the same conclusions were reached in terms of 21st century skills. However, this study is not similar to the studies of Akçöltekin (2018) and Cesur (2018), who detected a notable difference in support of women in their studies. Similarly, in the study (Sucuoğlu, 2022), in which it was emphasized that female teacher candidates work more planned and using time effectively, women were found to be significantly better off in online self-regulation skills. According to these results, it can be said that it is not possible to make a definite judgment about whether gender has any effect on teacher candidates' self-employability and responsibility capability.

The study's findings indicate that teacher candidates' self-employability and responsibility capability differs statistically significantly according to the idea of doing a master's degree. It has been found that the difference favors individuals who are thinking about pursuing a master's degree. It can be said that this result is similar to the finding of a significant difference in favor of "those who take part in a scientific study" in the research conducted by Akçöltekin (2018). In line with these results, it can be thought that teacher candidates who are considering a master's degree can carry out their scientific studies without needing any support and fulfilling their responsibilities during their education at the university.

According to another result, teacher candidates' self-employability and responsibility capability differs significantly at the class level. Accordingly, it has been found out that there is a significant difference in support of the 4th grade teacher candidates compared to the 2nd and 3rd grade students. In this case, it is conceivable to state that the final year teacher candidates have a higher level of individual working skills and ability to take initiative, thanks to the experiences they have gained during their education. In other words, it can be said that as the grade level of teacher candidates increases, they are more successful in working alone and taking responsibility.

The perspectives of teacher candidates on scientific research were also examined. According to the results, the teacher candidates are found to have a high level of positive and moderately negative perspectives on scientific research. In other words, the attitude of teacher candidates toward scientific

research has been found to be favorable and researchers. In a study on the scientific research skills of pre-service biology teachers (Aripin et al., 2021), the results showed that teacher candidates received the best marks in the sub-dimension of self-confidence, willingness to learn, self-awareness and self-discipline skills. In this respect, it can be said that these studies are similar to each other. Accordingly, it can be thought that teacher candidates are moderate toward science and researchers and do not approach scientific research with prejudice.

The results of the research revealed that the perspectives of teacher candidates on scientific research differed significantly according to gender, the idea of doing a master's degree, grade point average, department and degree of satisfaction with the department they studied. When we look at the studies in the literature, a significant difference was found in favor of women in the research conducted by Polat (2014). It has been concluded that the perspectives of teacher candidates on scientific research are more positive for female teacher candidates than for male teacher candidates. Based on this result, it is understood that female teacher candidates have a more positive view of science and they are more curious and willing to do so. In addition, it can be predicted that female teacher candidates will use their scientific process skills more than male teacher candidates while performing their profession. On the other hand, Aşiroğlu's (2016) study does not overlap with this study because there was not a noticeable gender-related difference.

The significant difference between prospective teachers in favor of those who are considering a master's degree and those with a high-grade point average shows that students who are academically successful in their education life are also inclined to conduct scientific research. The fact that students with a low-grade point average have a high score in the sub-dimension of reluctance to assist researchers can be interpreted as seeing scientific studies as a chore.

The significant differentiation of teacher candidates' perspectives on scientific research according to the department also coincides with the results obtained by Göksel and Yıldız (2021). In this study, it was seen that English teacher candidates achieved higher scores in the dimensions of "reluctance to assist researcher" and Negative perspective on research, while in the study of Göksel and Yıldız (2021), it was concluded that the students of the Recreation Department had a more positive perspective. In this context, it is possible to say that the education received by the teacher candidates in the department they study can affect their view of scientific research positively or negatively. Bicer et al. (2013) with Turkish teacher candidates, significant differences were found at the grade level.

Another result included in the study revealed that there is a significant relationship between teacher candidates' self-employability and responsibility capability and their positive perspectives on scientific research. Additionally, a reasonably significant association was found, between reluctance to assist researchers and Negative perspective on research. Again, a low-level significant relationship was found between positive perspective on research and positive perspective on researchers. At this point, it is possible to assume that candidates who can direct their own studies and are aware of their own responsibilities are also inclined to conduct scientific research. Similarly, in the study conducted by Aktaş and Sançar (2021), an effective association was discovered between the nurse candidates' positive perspective on scientific research and their academic self-efficacy level.

According to the results obtained from the research, it was seen that the competencies of the teacher candidates' self-employability and responsibility capability differed significantly according to their grade level and their satisfaction with the department. Similarly, it was determined that the perspectives of teacher candidates on scientific research differed significantly according to gender, the idea of doing a master's degree, the degree of satisfaction with the department. Considering these results, it can be considered important to examine the situation of current working teachers via a similar study and variables such as branch, age, seniority, place of work and type of institution.

While no significant difference was found in the gender variable in some skills examined in this

study, it was revealed that there were significant differences according to gender in similar studies. In this context, a study can be conducted with a larger sample in order to make a clearer decision whether gender has an effect on 21st century skills.

In fact, it can be suggested that this research, which was carried out with teacher candidates, should be carried out at previous education levels in order to have clearer information about future generations and to guide them better. Because today, there are some skills that students are expected to have. These include essential skills such as self-learning and problem solving. When considered from this perspective, the implementation of a similar study in secondary education and even in the second level of primary education is important in terms of providing students with the necessary skills from an earlier age.

It can be suggested that a similar study can be applied to previous education levels, as well as to be carried out with our teachers who are actually practicing the teaching profession. Considering that one of the criticisms that teachers are exposed to is that they are inadequate in improving themselves, it can be said that determining teachers' perspectives on scientific research will also give an idea about this issue.

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