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# Pre-Service Science Teachers' Awareness of Technological Terms *

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| ARTICLE INFO | ABSTRACT |
|---|---|
| | **Purpose**: To accomplish the goals of science education, it is essential that science teachers have technological literacy. Thus, we need to determine the awareness of pre-service science teachers expected to possess a basic working knowledge of technological terms. The aim of this study was to examine the candidates' awareness level of technological terms and to examine the effect of gender, grade level and family income on this awareness. **Research Methods**: The sample of the current study comprises 212 students. The collected quantitative data were analyzed by using frequencies, percentages and Chi-square test. In the study, the second part of the Questionnaire of Technological Terms Awareness and Knowledge Level was used to collect data. **Findings:** |

Results of the study revealed that pre-service science teachers having a medium level awareness of technological terms are generally familiar with popular technological terms. Both gender and grade level were found to have a significant influence on the students' technological terms awareness. On the other hand, the family income level was found to have no significant effect on the students' awareness levels of technological terms. **Implications for Research and Practice:** It was found in this study that the pre-service science teachers' technological terms awareness level is medium. It can be suggested that more space should be allocated for technology-related concepts, applications and terms in the curriculums of science teacher training programs.

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### Introduction

The meaning of technology as a term refers to the knowledge or the action of the application of science, including production methods, equipment, tools and devices used during the application as well as the ways of using these methods and equipment (TDK, 2016). As a result of the rapid development of technology, it is of great importance to train individuals competent in the field of technology because technology is in fact "all the tools and equipment developed by humans to control and change their material environment and all the information produced about these tools and equipment" (TDK, 2016). When the power relations in the world are examined, it is seen that countries that can produce and market technology are also politically dominant in the world. In general, as technology is a concept closely intertwined with many disciplines, it has been classified in various ways in different disciplines. According to Web (2003), these classifications are as follows;

- technology as an object: tools, equipment, devices, weapons, machines

- technology as information: knowing about the development of technological innovations

- technology as an activity: skills, methods and interpretations of individuals

- technology as a method: need and analysis

- technology as a socio-technical system: combination of individuals and other objects, production and use of objects

For individuals to understand technology, they need to be technology literate. The characteristics of a technology literate individual are defined by the International Technology Education Association (ITEA) as follows.

- He/she knows what technology is, how it is produced and how it affects the society.

- He/she finds technology news on TV or read in a newspaper very interesting, and then acquires this information and reflects it into his/her behaviors and produces ideas on the basis of this information.

- He/she is impartial and comfortable in the use of technology. It is important for all individuals to understand why technology and its use are important for the country. (Canbaz, 2010)

The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2008) defines the political objective of technology literacy as training students, citizens and the labor force to keep up with new technologies so as to promote social development and improve economic efficiency. The process in which these policies are passed on in the education system can be defined as technology education or instruction. Technology education aims to increase the knowledge level of students about technology and technological products and to give them the ability to use technology (Sade & Coll, 2003). While technology education is carried out by

classroom teachers in elementary education, it is given by branch teachers in secondary education (Rasinen, 2003). According to the ITEA, students need to know the basic concepts of technology to be able to understand and implement technology (ITEA, 2000). According to Yazar (2013), while the awareness of technological terms can be defined as having knowledge about and familiarity with the relevant terms, technological literacy can be defined as knowing the meaning of technological terms and in which technological products they are used.

As technology can be highly effective in providing products increasing the quality of life, it first interests the individual and then the communities. An individual who is technology literate can understand the structure of the society and thus can better adapt to it. On the other hand, an individual who is not technology literate may face social and academic disadvantages. Integration of technology into education in today's world both facilitates permanent learning by reifying abstract concepts for students and enables teachers to teach more effectively and thus enhances the quality of education.

In this regard, technology should be provided at different levels of education from elementary to higher needs to be integrated into the field of education, one of the most important determinants of development, considering the requirements of the age. Rapid developments experienced in every area of life and increasing investment in education in the late 20th century forced educators to revamp the education system (Bacanak, Karamustafaoglu & Kose, 2003). When teachers do not make use of suitable technologies in their instructional technologies, students may have greater difficulties in learning subjects and retaining information (Dogan et al., 2010). In today's world there is fierce competition in every aspect of life and the integration of technology into education might bring considerable competitive advantages to countries.

Familiarity with technological terms – most of which originated in English and are widely used in daily life and the internet – will help teachers use new technologies in their classes. Moreover, educational institutions, teachers and parents have to be able to assist students who use the computer and mobile phone every day in their daily lives, watch audiovisual broadcasting on digital platforms, conduct voice and data transfers and are familiar with an increasing number of new technologies (Aksoy, 2003). When the world education system is examined, we can see that, aside from classes solely aiming to teach the computer and technology, science classes are the classes where information is gained about technological devices and where technological concepts are frequently used. Therefore, governments are making changes in their science curricula so that they play an important role in the educational process and in the transfer of technological knowledge parallel to the changes taking place in the society, culture and common practices (Bacanak et al., 2003). Training technology-literate individuals and development of educational programs that can enable students to understand technological concepts are just as important as the use of technology in education.

At the end of the 1980s and early 1990s, during the process of shifting from an emphasis on handicrafts and vocational training to modern technology education, technology courses were largely taught by older technical teaching staff who were gradually replaced by science teachers in the following years (De Vries, 1994). To meet the objectives of technology teaching programs properly, these teachers were included in in-service training programs. One of the main tasks of the teachers, according to the technology curricula implemented in this period, was to get their students to prepare technology projects in groups. By the year 2000, the number of teachers having graduated from high-tech universities had increased, and they took the place of traditional teachers (Ginestie, 2005). Today, not only technology branch teachers but also all teachers are required to have knowledge and skills in technology. In France, one of the ten essential qualities of every teacher who graduates from the Institutes of Teacher Training – responsible for teacher training there – is mastery of Information and Communication Technology (Eurydice, 2007). According to Burkhardt et al. (2003), individuals should possess digital age literacy, creative thinking and effective communication skills as well as planning and management skills necessary for achieving higher efficiency.

In recent years, many technology-intensive scientific studies have been carried out, and, in particular, serious research on technology-assisted learning has been intensified. Research on technological term awareness has been found to be rather limited, while studies in the field have focused mainly on teachers' attitudes toward technology use in education, factors affecting the use of technology, and the effect of the use of technological tools on education. In one study, Ozsevgec and Yazar (2012) investigated technological term awareness of pre-service teachers from different programs of an educational faculty. The purpose of the current study is to determine the technical term awareness of the pre-service teachers only from the department of science education in our university and thus to offer some guidance for other researchers to conduct similar studies in different universities. In this way, it will be possible to make comparisons and to reach some generalizations about the subject.

In a study by Isman, Isbulan, Demir and Canan (2008), it was found that students are interested in the internet, but they experience some problems in understanding the language and new computer technologies. As time goes by, with the fast-paced changes in technology, the introduction of new products and upgrades of the features in these products, new concepts are constantly entering our life. For this reason, it is thought that if teachers cannot improve their skill and knowledge level to use technological products that are available under current conditions, they will encounter various difficulties in responding to the questions of students familiar with the technological contexts (Ozsevgec & Yazar, 2012). For teachers who are not g technologically savvy or who cannot integrate technology with their education, alienation from technology will be inevitable; thus, technology expected to benefit education can be detrimental to it. The science and technology curriculum in our country aims to educate all students regardless of their individual differences as science and technology literate (MEB, 2006). Parallel to this objective, during science classes, great emphasis should be put on the training of individuals who attach

desired importance to technology and are knowledgeable about it by making use of technology as well as talking about its importance in the classes.

As governments update their education systems, they follow developments in the field of technology and develop programs to train individuals who can master the challenges of this change. It is expected that the teachers who will train the individuals in these programs are those who have the information and technology that the age demands and can keep pace with the changes (Yilmaz, 2007). If the teacher has specialized knowledge in the field where the pedagogy intersects with the content, then the technology should be considered one of the inputs that shape this knowledge. The learners need to know the basic concepts of the technology to be certain they are "understanding the nature of technology" (Yazar, 2013). According to Archer and Roberts (1979), the use of technology in different lessons and at every stage of education is important in raising technology awareness by increasing the knowledge being acquired.

Technology plays an important role in teachers' selecting proper technologies to be used in their instructional activities, making students more active in classes, helping students learn subjects more easily and retain information longer and in providing concrete examples (Altun, Yigit & Adanur, 2011). The results of the Information, Communication and Technology (ICT) in Schools Survey conducted by the EU, with the participation of teachers and school directors, revealed that many students do not get the technological knowledge and practice they need at school and that teachers need more support and training (European Commission, 2013). Therefore, in the use of technology as an instructional tool, the related qualifications of teachers and pre-service teachers, particularly their technology skills, term awareness and term literacy are of special importance (Seferoglu, 2008). According to Hur, Cullen and Brush (2010), acquisition of technology knowledge and utilization skills during the undergraduate education by pre-service teachers will help them impart these skills to their students in their future career. In this respect, experts and authorities on teacher education policies and strategies emphasize that the integration of technology into learning environments can only be achieved through an effective reform of the pre-service teacher training process.

However, when the studies conducted on the use of technology in education are examined, it is seen that teachers are not familiar with technological terms during their undergraduate education and later they are hesitant about using technology in their classes. For instance, in a study conducted in 2003, it was found that many of nearly 3,000 novice teachers did not integrate technology into their instruction, contrary to what they stated in their syllabuses and they felt uncomfortable while using technology in class (Russell, Bebell, O'Dwyer & O'Connor, 2003). In this connection, the current study is thought to be original as the number of studies focusing on pre-service science teachers' level of knowing the meanings or usage areas of terms they encounter in their daily lives is quite limited. The information revealed by the current study may help us to determine how to train teachers better. We are living in the information age and in this age, familiarity of pre-service teachers with technological concepts might help them to train their students to be

technology literate and as individuals who can find solutions to the technology-related problems encountered in daily life. Constantly keeping pre-service teachers' awareness and knowledge levels up-to-date can clearly contribute to the training of digital learners of the future as more competent individuals.

Pre-service training received by pre-service teachers is of great importance for them to use technology in their professional lives at the desired level. However, studies conducted by researchers, such as Akkoyunlu and Kurbanoglu (2003), Arslan (2006), and Karal and Berigel (2006), show that pre-service teachers graduate from education faculties without acquiring the skills required for using technology effectively in education. For instance, Karal and Berigel (2006) stated that newly graduated teachers have some shortcomings in adapting technological developments into the educational-instructional process and in making use of technology. As the development level of countries is associated with their quality of education, increasing students' awareness of technological terms and developments during their educational life will make important contributions to their academic and social lives. Pre-service teachers' levels of technological awareness and knowledge and how competent they are at technology are not known well. In this connection, the current study aims to investigate science teacher candidates' awareness of technological terms and the effect of gender, grade level and family income level on this awareness. In this context, the research questions of the study are as follows:

1. What is the science teacher candidates' technological terms awareness level?

2. What is the effect of gender on the pre-service teachers' technological terms awareness?

3. What is the effect of grade level on the pre-service teachers' technological terms awareness?

4. What is the effect of family income level on the pre-service teachers' technological terms awareness?

## Method

### Research Design

The current study was conducted by using the survey method. The survey model is generally used to find out the attitudes, beliefs and opinions of a group chosen for educational research about a topic (McMillan & Schumacher, 2006). It was decided that this method was appropriate to be used as the main research design in this study.

### Research Sample

The sampling of this descriptive study employing the survey model comprised 56 first-year students, 59 second-year students, 56 third-year students and 41 fourth-

year, in all a total of 212 students, attending the Department of Science Teaching at Mugla Sitki Kocman University in the 2015-2016 academic year.

*Research Instruments and Procedures*

In the current study, an information form developed by the researchers to find out the demographic properties of the science teacher candidates (gender, grade level, family income level) and the Questionnaire of Technological Terms Awareness and Knowledge Level developed by Ozsevgec, Batman, Yazar and Yigit (2014) were used as data collection instruments. The original questionnaire comprised four parts: the first part aiming to elicit students' demographics, the second part having 85 technological terms, the third part aiming to reveal the relationship between the technological tools most commonly used in the daily lives of pre-service teachers, such as television, computer, camera and mobile phone, and other technological terms. and the fourth part including open-ended questions to investigate participants' awareness of technological terms by using 20 significant technological terms. However, in the current study, only the second part of the questionnaire was used to collect data. The second part of the Questionnaire of Technological Terms Awareness and Knowledge Level (QTTAKL) consists of 85 terms and is intended to elicit the pre-service teachers' awareness level of technological terms.

*Data Analysis*

The collected data were analyzed in line with the research questions. The teacher candidates were asked to mark the given 85 terms to indicate the technological terms they were acquainted with. In the analysis of the collected data, Statistical Package for Social Sciences (SPSS) software was used and the significance level was set to be 0.05. The pre-service science teachers' technological terms awareness level was analyzed through descriptive statistics, and the effect of gender, grade level and family income level on this awareness was analyzed with the Chi-square goodness-of-fit test. Technological terms awareness levels were classified as low, medium and high. When all the terms are marked, the highest possible value to be obtained is 85. Participants marking 0 to 28 items are classified as having low-level awareness, those marking 29 to 57 items are classified as having medium-level awareness and those marking 58 to 85 items are classified as having high level awareness.

## Results

The data collected through the questionnaire were analyzed by using appropriate statistical techniques and the findings obtained were tabulated and then interpreted.

*Findings Concerning the First Research Question*

The first research question was What is the science teacher candidates' technological terms awareness level? This question was designed to determine the candidates' technological terms awareness level by asking them to mark the terms they frequently encounter in their daily lives from among all the terms given in the questionnaire. Frequencies and percentages related to the pre-service teachers' technological terms awareness level are given in Table 1.

**Table 1**

*Science Teacher Candidates' Technological Terms Awareness Level*

| Low | | Medium | | High | |
|-----|-----|--------|-----|------|-----|
| N | % | N | % | N | % |
| 20 | 9.4 | 102 | 48.1 | 90 | 42.5 |

It can be seen in Table 1 that 9.4% of the teacher candidates had a low awareness level; 48.1% of them had a medium awareness level and 42.5% of them had a high awareness level. It is clear that many of the teacher candidates have a medium level of technological terms awareness (48.1%).

*Findings Concerning the Second Research Question*

The second research question was What is the effect of gender on the pre-service teachers' technological terms awareness? The aim of this question was to determine how gender affected the pre-service teachers' technological terms awareness. The results of the Chi-square test conducted to determine the effect of gender on the teachers' candidates' awareness of technological terms are presented in Table 2.

**Table 2**

*The Results of The Chi-Square Test Conducted to Determine the Effect of Gender on Awareness*

| Gender | Low | Medium | High | Total |
|--------|-----|--------|------|-------|
| Female N (%) | 17 (11.1) | 79 (51.6) | 57 (37.3) | 153 (100) |
| Male  N (%) | 3 (5.1) | 23 (39.0) | 33 (55.9) | 59 (100) |
| Total  N (%) | 20 (9.4) | 102 (48.1) | 90 (42.5) | 212 (100) |

$\chi^2 = 6.55$; sd = 2; p = 0.03; p<.05

As can be seen in Table 2, there is a significant correlation between the pre-service teachers' awareness of technological terms and gender ($\chi^2_{(2)} = 6.55$; p<.05). While most of the female pre-service teachers (51.6%) have medium-level awareness, most of the male students (55.9%) have high-level awareness. Moreover, 11.1% of the female pre-service teachers and 5.1% of the male pre-service teachers have low technological terms awareness level.

*Findings Concerning the Third Research Question*

The third research question was What is the effect of grade level on the pre-service teachers' technological terms awareness? This question problem aimed to determine the effect of grade level on the pre-service teachers' awareness of technological terms. The results of the Chi-square test conducted to examine the effect of grade level on the science teacher candidates' awareness of technological terms are presented in Table 3.

As can be seen in Table 3, there is a significant correlation between the science teacher candidates' awareness of technological terms and grade level [$\chi^2_{(6)}$=18.12; p<.05]. Many of the first-grade and third-grade students (58.9% and 44.6%, respectively) have high-level awareness; on the other hand, many of the second-year and fourth-grade students (62.7% and 51.2%) have medium-level awareness.

**Table 3**

*The Results of the Chi-Square Test Conducted to Determine the Effect of Grade Level on Awareness*

| Grade level | Low | Medium | High | Total |
|---|---|---|---|---|
| 1  N (%) | 4 (7.1) | 19 (33.9) | 33 (58.9) | 56 (100) |
| 2  N (%) | 9 (15.3) | 37 (62.7) | 13 (22.0) | 59 (100) |
| 3  N (%) | 5 (8.9) | 25 (44.6) | 26 (46.4) | 56 (100) |
| 4  N (%) | 2 (4.9) | 21 (51.2) | 18 (43.9) | 41 (100) |
| Total N (%) | 20 (9.4) | 102 (48.1) | 90 (42.5) | 212 (100) |

[$\chi^2$ = 18.12; sd = 6; p = 0.00; p<.05]

*Findings Concerning the Fourth Sub-Problem*

The fourth research question was What is the effect of family income level on the pre-service teachers' technological terms awareness? The aim of this question was to determine the effect of family income level on the pre-service teachers' awareness of technological terms. The results of the Chi-square test conducted to examine the effect of family income level on the teacher candidates' awareness of technological terms are presented in Table 4.

**Table 4**

*The Results of the Chi-Square Test Conducted to Determine the Effect of Family Income Level on Awareness*

| Family income | level | Low | Medium | High | Total |
|---|---|---|---|---|---|
| 500- 1500 YTL | N (%) | 11 (13.9) | 39 (49.4) | 29 (36.7) | 79 (100) |
| 1501- 2500 YTL | N (%) | 3 (4.2) | 38 (52.8) | 31 (43.1) | 72 (100) |
| 2501- 3500 YTL | N (%) | 1 (3.2) | 16 (51.6) | 14 (45.2) | 31 (100) |
| 3501 YTL and more | N (%) | 5 (16.7) | 9 (30.0) | 16 (53.3) | 30 (100) |
| Total | N (%) | 20 (9.4) | 102 (48.1) | 90 (42.5) | 212 (100) |

[ $\chi^2$ = 10.72; sd = 6; p = 0.97; p>.05 ]

The data presented in Table 4 show that there is no significant correlation between the pre-service science teachers' awareness of technological terms and their family income level [$\chi^2_{(6)}$= 10.72; p>.05]. It can be seen from the table that many of the pre-service teachers with family income levels of 500-1500 TL, 1501-2500 TL and 2501-3500 TL (49.4%, 52.8% and 51.6%; respectively) have medium-level awareness, while most of the pre-service teachers with a family income level of 3501 and more (53.3%) have high-level technological awareness.

## Discussion and Conclusion

At the end of the current study, it was concluded that the teacher candidates having a medium-level awareness of technological terms in general are mostly acquainted with popular technological terms. When the related literature is examined, it is seen that research focusing on the awareness of technological terms is quite limited. Becker and Maunsaiyat (2002), by using their adapted Scale of Technological Attitudes and Concepts, investigated Thai and American students' attitudes toward technological concepts and technology. Their findings revealed significant differences in favor of American students. These differences were reported to be a result of the education systems and cultures and Thai teachers' preference for a teacher-centered teaching approach. Pamuk (2007) intended to investigate the correlation between computer self-efficacy and attitudes toward the computer of pre-service science and mathematics teachers and the effect of gender, grade level, department, and the state of computer ownership on their self-efficacy and attitudes. The findings of the study revealed that the pre-service science teachers and mathematics teachers have high computer self-efficacy and attitude.

A significant correlation was found between the pre-service science teachers' awareness of technological terms and gender. The female students' technological terms awareness level is medium (the number of terms: 29-57) and the male students' technological terms awareness level is high (the number of terms: 58-85). Birgin, Coker and Catlioglu (2010) investigated the computer and internet use of first-year pre-service teachers in relation to the gender variable. They concluded that though computer ownership is higher among female students, male students' computer experience and their frequency of computer use were higher than for female students. Furthermore, while attitudes toward the computer did not significantly vary depending on gender, computer competencies are significantly in favor of the male students. Ozsevgec and Yazar (2012) found that male teacher candidates' technological terms awareness is higher than that of female teacher candidates. Kose, Gencer and Gezer (2007) investigated the attitudes of first-year students of vocational school of higher education toward the use of computers and the internet and the effect of variables such as program, gender, the state of computer ownership and access to the internet on these attitudes. Their findings revealed that students have positive attitudes toward the use of the computer and internet. These findings support the related finding of the current study. Akcay (2013) examined the Turkish language pre-service teachers' competencies of knowing the Turkish meanings of

informatics terms originating in a foreign language and concluded that gender had no influence on their competencies. This is not parallel to the finding of this study.

A significant correlation was found in our study between the pre-service science teachers' awareness of technological terms and their grade level. It was found that most of the first-year and third-year students had high-level awareness and most of the second-year and fourth-year students had medium-level awareness. It was determined that the first-year students' awareness level was higher than that of the third-year students. Bilecik, Çaglayan and Guven (2012), by using a Technological Knowledge Questionnaire, investigated the knowledge of 12 pre-service science and technology teachers about technology and technological products. It was found that third-year and fourth-year students provided more conscious responses to the questionnaire items than first-year and second-year students. Ozsevgec and Yazar (2012) found that the third-grade pre-service teachers had a higher level of awareness of technological terms than that of the first-grade students. Pamuk (2007) stated that grade level is an important factor significantly affecting computer self-efficacy and that fourth-year students had a higher level of computer self-efficacy than first-year students. Menzi, Calıskan and Cetin (2012) investigated pre-service teachers' technological competencies in terms of various variables. In terms of grade level, it was observed that from the first year toward the fourth year, the pre-service teachers' technological competencies developed in all 15 subdimensions. The findings of the current study do not concur with this finding.

In the current study, it was concluded that there was no significant correlation between the pre-service teachers' awareness of technological terms and the income levels of their families. Ozsevgec and Yazar (2012) found that pre-service teachers having higher family incomes have higher technological terms awareness than the pre-service teachers with lower family incomes. This finding is not parallel to the finding of this study.

The findings of the current study are limited to the pre-service teachers attending the Department of Science Teaching at the Education Faculty of Mugla Sitki Kocman University. In light of these findings, it can be suggested that more emphasis should be placed on technology-related concepts, applications and terms within the context of the courses Computer I-II and Teaching Technologies and Materials Design given to science students at education faculties so that the pre-service teachers can raise their awareness of new technological terms. A technology dictionary defining technological terms used for technological products, the meanings of these terms and the technological products they are used in can be prepared. Thus, students can learn the meanings of unknown terms easily. Further research may look at the effects of computer, TV or smart mobile phone possession on pre-service teachers' awareness of technological terms. The terms included in the questionnaire might undergo slight changes and then be administered to students from various levels of schooling; thus, comparative studies could be conducted.

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## Fen Bilgisi Öğretmen Adaylarının Teknolojik Terim Farkındalıkları

**Atıf:**

## Özet

*Problem Durumu:* Ülkelerin hedeflenen düzeye ulaşması için, müfredatlarda yapılan reformlar ya da öğretmenlere yönelik hizmet içi eğitimler fen eğitiminin kalitesini arttıracak yollardandır. Fen ve teknoloji dersleri müfredat değiştirilerek, öğrencilerin dünya algılarının değişmesi hedeflenmiştir. Fen ve Teknoloji dersi programının temel amacı, öğrenci kişisel farklılıklarına bakılmaksızın bütün öğrencilerin birer fen ve teknoloji okuryazarı olabilmeleridir. Fen ve Teknoloji okuryazarı olmak ise dünyadaki gelişmeleri takip edebilecek kadar bilgi sahibi olmayı, sadece terim bilgilerinin değil, teknoloji ile ilgili olan kavramların da bilinmesini, farklı alanlarda bireyin önüne çıkan yenilikleri kabullenici ve sorgulayıcı olmayı gerektirmektedir. Teknoloji okuryazarlığı ise günlük hayat içerisinde yer alan ve teknoloji ile iç içe olan her insan için ihtiyaçtır. Teknoloji okuryazarlığının kalıcı bir şekilde kazandırılması için bazı hususlara dikkat edilmesi önem arz etmektedir. Teknoloji okuryazarlığının en önemli ve evrensel nitelikte olan boyutu teknolojiye ait anahtar kavramların doğru bilinmesi ve küresel dünyada/teknolojide oluşan ortak dilin netleştirilerek daha anlaşılabilir duruma getirilmesidir. Fen Eğitiminde hedeflenen amaçlara ulaşmada, öğretmenlerin teknolojik okuryazarlığa sahip olması önem arz etmektedir. Çünkü fen; biyoloji, kimya ve fizik bilimlerini kapsarken, teknoloji ise bu bilimlerin çalışmaları sonucunda elde ettikleri ürünleri ortaya koyar. Teknoloji okuryazarı bireyler, teknoloji ile toplum arasındaki ilişkinin anlaşılmasında kendi yerini belirleyerek, gerekli olan entelektüel birikim, özgüven ve disiplin sahibi olabilendir. Fen bilimleri ise bu anlamda öğrencilere bilim ve teknoloji açısından olumlu tutum kazandırmada oldukça etkilidir. Ancak ülkemizde bu alanda yapılan çalışmalar

incelendiğinde bireylerin teknoloji okuryazarı olma anlamında hedeflenen düzeyde olmadıkları görülmektedir. Bu durumun nedenleri arasında, okullarımızda gerek okul desteğiyle gerekse hükümetler tarafından gerçekleştirilen projelere yardımıyla birçok bilgisayar, teknolojik cihazlar, internet erişimi ve ders yazılım programlarının bulunmasına rağmen, öğrencilere bu araçlar yardımıyla öğretim gerçekleştirebilme ve teknolojik bilgileri yeterli düzeyde aktarabilecek yetişmiş, nitelikli ve bu alanda hakim öğretmen sayısının yetersiz olmasıdır. Dolayısıyla teknoloji-okuryazarı özelliğine sahip olması istenen ve geleceğin öğretmenleri olacak olan öğretmen adaylarının, teknolojik terim farkındalıklarının belirlenmesi bu anlamda önemlidir.

*Araştırmanın Amacı:* Bu çalışmanın amacı, fen bilgisi öğretmen adaylarının teknolojik terim farkındalık düzeylerini belirleyerek, cinsiyet, sınıf düzeyi ve aile gelir düzeyi değişkenlerinin etkisini araştırmaktır.

*Araştırmanın Yöntemi:* Tarama modelinde yürütülen bu araştırmanın örneklemini, 2015-2016 Öğretim yılında Muğla Sıtkı Koçman Üniversitesi Eğitim Fakültesi İlköğretim Bölümü Fen Bilgisi Öğretmenliği programında öğrenim gören seçkisiz olarak örnekleme alınan 56 1. sınıf, 59 2. sınıf, 56 3.sınıf ve 41 4. sınıf olmak üzere toplam 212 öğretmen adayı oluşturmaktadır. Çalışmada "Teknolojik Terimler Farkındalık ve Bilgi Düzeyi Anketi"nin ikinci bölümü kullanılmıştır. Anketin ikinci bölümü, 85 terimden oluşmakta ve öğretmen adaylarının teknolojik terim farkındalıklarının belirlenmesini amaçlamaktadır. Araştırma verileri üzerinden hesaplanan Cronbach Alfa güvenirlik katsayısı 0.79 olarak tespit edilmiştir. Nicel olarak toplanan veriler; frekans, yüzde dağılım ve kay- kare testi kullanılarak çözümlenmiştir.

*Araştırmanın Bulguları:* Bu araştırmada orta düzeyde teknolojik terim farkındalığına sahip öğretmen adaylarının güncel teknolojik terimlere çoğunlukla aşina oldukları ortaya çıkmıştır. Bu durum hem teknolojik araçları hem de kitle iletişim araçlarını kullandıkları ya da sıkça karşılaştıkları şeklinde yorumlanabilir. Cinsiyetin, Fen Bilgisi öğretmen adaylarının teknolojik terim farkındalıklarında etkili bir rol oynadığı belirlenmiştir. Kız öğrencilerin teknolojik terim farkındalıklarının orta düzeyde, erkek öğrencilerin ise yüksek düzeyde olduğu tespit edilmiştir. Bu durum, erkeklerin doğası gereği teknolojik araç ve gereçlere kızlara nazaran daha fazla ilgi duymasına bağlanabilir. Sınıf düzeyi öğretmen adaylarının teknolojik terim farkındalıklarında fark yaratmış olup, 1. ve 3. sınıf öğrencilerinde yüksek, 2. ve 4. sınıf öğrencilerinde ise çoğunlukla orta düzeyde teknolojik terim farkındalığına sahip olduğu sonucuna ulaşılmıştır. Ayrıca 1. sınıfların teknolojik terim farkındalıklarının 3. sınıflara göre daha yüksek olduğu tespit edilmiştir. Lisans öğrenimlerinin sonlarına doğru gerek derslerin yoğunlaşması gerekse KPSS'ye yönelik hazırlanma süreci bu tür teknolojik kavramlara uzak kalmalarına neden olabilir. Bunun yanında öğretmen adaylarının aile gelir düzeyi, teknolojik terim farkındalıklarını etkilememiştir. Bunun sebebi gelir düzeyi düşük olan ailede yetişen öğretmen adaylarının teknolojik imkânlara karşı meraklı ve araştırmacı olması gösterilebilir.

*Tartışma ve Sonuç:* Öğretmen adaylarının günümüz teknolojisine ayak uydurabilmesi, hem çevresindeki teknolojik olayları anlamlandırabilmesine hem de teknolojinin eğitime entegrasyonunu algılayabilmesine katkı sağlayacaktır. Bu bağlamda araştırmada fen bilgisi öğretmen adaylarının teknolojik terim farkındalıklarının orta düzeyde olduğu belirlenmiştir. Teknolojik terim farkındalığı ile cinsiyet ve sınıf düzeyi arasında anlamlı bir ilişki olduğu ancak aile gelir düzeyinin anlamlı bir farklılık yaratmadığı sonucuna ulaşılmıştır. Bu sonuçlar doğrultusunda Eğitim fakültelerinin Fen Bilgisi Öğretmenliği öğretim programlarında bulunan derslerde teknoloji ile ilgili kavramlara, uygulamalara ve terim bilgilerine daha fazla yer verilebilir. Ankette yer alan terimler zaman içerisinde güncellenerek farklı öğretim kademelerinde yer alan öğrencilere uygulanarak daha kapsamlı ve karşılaştırmalı bir çalışma yapılabilir. Gelişmiş ülkeler, eğitim programlarını oluştururken teknolojiye hızlı adapte olabilen, teknolojiyi verimli kullanabilen ve en önemlisi de teknolojiyi üretebilen bireyler yetiştirmeyi hedef almaktadırlar. Bu bağlamda üniversite düzeyinde teknoloji eğitimi, ihtiyaçlar doğrultusunda yeniden yapılandırılarak öğretim programlarında daha fazla yer verilmesi, teknoloji okuryazarı öğretmen adayı sayısının artmasına yardımcı olabilir.

*Anahtar sözcükler:* Aile gelir düzeyi, teknoloji, teknolojik bilgi, fen eğitimi.