

## Development of Students' Skills to Write Research Reports Through Research Methods in Education Course

*Öğrencilerin Eğitimde Araştırma Yöntemleri Dersi Süresince Bilimsel Araştırma Raporu Yazma Becerilerinin Gelişiminin İncelenmesi*

### ABSTRACT

In this study, it was aimed to examine the effect of the research education given in the "Research Methods in Education" course on the ability of students to write research reports. The study was carried out in the education faculty of a foundation university. The research was designed in case study design and convenience sampling method was used. Ninety-three students who took the relevant course formed the sample voluntarily. During the four weeks of research education, the research reports prepared by the students were evaluated on the rubric. The three-point rating rubric was developed by the researcher. The reports were evaluated simultaneously by the researcher and an independent evaluator, and the inter-rater reliability coefficient was calculated at the end of the evaluation. The calculated coefficient was found to be .93 and it was concluded that the evaluations were reliable. According to the findings obtained from the data, it can be said that providing research education given within the scope of the related course contributes to students' ability to write Introduction and Methods sections of the reports. However, it was observed that the education wasn't effective on writing and organizing References section.

**Keywords:** Academic Writing Skills, Research Methodology, Research Reports

### ÖZET

Bu çalışmada, Eğitimde Araştırma Yöntemleri dersinde verilen araştırma eğitiminin öğrencilerin bilimsel araştırma raporu yazma becerilerine olan etkisi belirlenmeye çalışılmıştır. Çalışma bir vakıf üniversitesinin eğitim fakültesinde yürütülmüştür. Araştırmada, durum çalışması deseni kullanılmıştır. Uygun örnekleme yöntemi kullanılarak, dersi almakta olan 93 gönüllü öğrenci araştırmanın örneklemini oluşturmuştur. Araştırmacı tarafından geliştirilen bir değerlendirme rubriğiyle, araştırma eğitiminin verildiği dört hafta süresince öğrencilerin hazırlamış oldukları raporlar değerlendirilmiştir. Raporlar, araştırmacı ve bir bağımsız değerlendirici tarafından eş zamanlı olarak değerlendirilmiş ve değerlendirme sonunda puanlayıcılar arası güvenilirlik katsayısı hesaplanmıştır. Hesaplanan katsayı .93 olarak bulunmuş ve değerlendirmelerin güvenilir olduğu sonucuna varılmıştır. Araştırma verilerinden elde edilen bulgulara göre, araştırma eğitiminin öğrencilerin bir araştırma raporunun Giriş ve Yöntem bölümlerini yazabilme yeterliklerine katkısı olduğu söylenebilir. Bununla birlikte; verilen eğitimin araştırma raporunun Kaynakça bölümünü hazırlama yeterliklerine katkısının olmadığı görülmüştür.

**Anahtar Kelimeler:** Akademik Yazma Becerileri, Araştırma Metodu, Araştırma Raporu

### INTRODUCTION

In the scientific world, due to how quickly knowledge changes and increases, individuals who can use structured information instead of ready-made information are needed. In addition to acting as valid and reliable sources of information, schools are trying to teach ways to access, use and generate accurate information. To use the scientific methods considered to be the most reliable, an education is absolutely needed.

The scope of this training process, called research education, has been defined by Karasar (2015) as the teaching of research methods and techniques, measurement and statistics. Creswell (2012) defined research as a process of steps used to collect and analyse information for increasing our understanding of a topic or issue. Research takes many forms and incorporates many tools, methods and techniques with which we attempt to understand the world around us. All research relates to questions or problems which present themselves and to which the researcher seeks answers and understanding (Anderson, 2005). While the term research can refer to any sort of careful, systematic study or investigation in some field of knowledge, basic research is concerned with clarifying underlying processes, starting with a hypothesis that is usually expressed as a theory (Fraenkel, Wallen & Hyun, 2012).

Balcı (2009) described scientific research as data collection and the analysis of that data through certain purposes and systematic processes, while Ekiz (2003) defined it as systematic, planned, and sometimes controlled study to

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obtain scientific information about social and physical phenomena. When researchers conduct a study, they proceed through a distinct set of steps. The steps of this process, as identified by Creswell (2012), are: 1. identifying a research problem, 2. reviewing the literature, 3. specifying a purpose for research, 4. collecting data, 5. analysing and interpreting the data and 6. reporting and evaluating research.

It is possible to express the systematic processes, which are common in all definitions, as the stages of the scientific method. In order to solve a problem that has been addressed, the following stages need to be addressed: noticing the problem, defining the problem, hypothesising solution proposals, developing the research method, collecting and analysing the data, decision-making and interpretation (Bailey, 1987; Cohen & Manion 1988; Mason & Bramble 1978). However, as Day (2000) points out, the purpose of scientific research is to achieve results that add to the existing base of knowledge, and thus a scientific experiment with dazzling results is not complete until it is published. Therefore, scientific researchers are typically required to write up and publish their findings. Looking at the history of scientific literature, there have been significant developments in methodology from articles described as "visual" writing to today's writing styles (Day, 2000).

By the 19th century, international scientific journals adopted the view that a common format should be used, from which the IMRaD format emerged. The IMRaD format suggests that a paper be structured in four main sections: Introduction, Methods, Results and Discussion. The Introduction explains why the research is important or necessary, while the Methods section tells readers how the study was conducted. It includes information about the universe, sample, methods and tools. In the Results section, the research's findings are presented, typically without any explanation of or commentary on the findings. In the Discussion section, the researcher summarizes his or her main findings, comments on those findings and connects them to other research (Writing Center, 2015). In accordance with the international IMRaD format, Karasar (2015:38) provided the following outline for research reports: "the name of the research, problem, purpose of the research, importance of the research, assumptions (if any), limitations (if any), definitions, method (with subtitles), duration and possibilities, provisional outlines, appendices (if any), bibliography". In research reports; problem status, purpose, importance, assumptions, limitations and definitions are included in the Introduction section, while the research model, universe and sample, data collection and data analysis are placed in the Methods section. The research report is then completed by writing the Findings and Interpretation and Reference sections (Bailey, 1987; Balçı, 2010; Büyüköztürk, Kılıç, Akgün, Karadeniz & Demirel, 2010; Cohen & Manion, 1994; Karasar, 2008; Siyez, 2016; Sönmez & Alacapınar, 2016).

Özdemir and Binyazar (1969) stated that anyone who has acquired the knowledge and skills related to writing can prepare and write a research report. However, there are some features that distinguish a research report from other reports or essays. For example, a research report should have scientific features and include sections such as a title, abstract, introduction, method, findings, discussion, conclusion, recommendations and references (Siyez, 2016). It is necessary to plan the stages of recognizing the problem and creating solutions, which are the first steps to solving the problem. During this planning, which we can describe as the framework of the research, a "research proposal" should be written. This step is also an assurance for the success of the research to be conducted (Karasar, 2015).

The basis of research education is for students to gain the habit of individual study, to be practical and to accept the responsibility of learning (Karasar, 2008). In this context, the "Scientific Research Methods" course was added to "Teacher Education Programs", along with some General Culture courses, as part of the restructuring process carried out in the 2006-2007 academic year in Turkish higher education teacher training programs (Council of Higher Education, 2007). The "Research Methods in Education" course was included with the changes in teacher training programs carried out by Council of Higher Education in 2018, with almost the same content beginning with the 2019-2020 academic year (CoHE, 2018). In the recommended content of the course, research education is be taught and students are expected to learn research methods, search resources related to a subject, conduct research on the subject, collect data on it, learn the methods of analysing the data they collect and finally present a scientific report. In this line, "selection of research topic, creation of research question", " literature review", "literature review methods", "literature summarization and interpretation", and "reporting of research according to Apa7" topics were taught through the courses in this research. In first week, writing the title of a report, selecting appropriate keywords, determining the purposes of the research, writing the importance, assumptions and limitations of the research were taught. In the second and third week, determining the design of the research, choosing the appropriate sampling method and collecting data and analyzing data courses were taught. In the fourth week, writing the references according to the APA standarts and checking the relevant resourses courses were taught.

Turkish literature reviews also reported that various studies were conducted to determine how much students' ability to conduct scientific research had improved. These studies revealed that at the level of Turkish higher

education, scientific research education was not sufficiently developed and, as a result, the proficiency of the pre-service teachers in writing the problem status, method, findings and conclusion/suggestions of a scientific article was weak compared to their proficiency in the dimensions related to the formality of the research, such as compliance with the writing rules, as well as that they found it unnecessary to conduct scientific research and could not fully understand the nature of scientific researches (İpek, Tekbıyık & Ursavaş, 2010; Küçükoğlu, Taşgım & Çelik, 2013; Taşdemir & Taşdemir, 2011). In addition to suggestions such as adapting the researcher-teacher approach to the students in the Research Methods in Education course and making it compatible with the measurement-evaluation course, other findings were that the pre-service teachers' attitudes towards scientific research were of a high level and that their attitudes toward scientific research did not differ according to academic achievement, gender or department (Konokman, Tanrıseven & Karasolak, 2013; Korkmaz, Şahin & Yeşil, 2011; Kurt, İzmirli, Fırat & İzmirli, 2011; Tomakin, 2007). Moreover, Çetin and Dikici's (2014) research on the course's effectiveness reported that the course instruction was inadequate concerning the process of determining a research question; methods, techniques and data collection tools; literature reviewing; the processes of validity-reliability and competence in ethical rules; and the reporting, writing and data analysis processes in accordance with APA style.

When studies on the subject in the international literature were examined, it was found that a large body of international studies on the integration of research and teaching had moved in the last fifteen years from teacher-focused approaches emphasising the incorporation in curricula of knowledge derived from research to a focus on creating strategies for students to learn through various forms of research and inquiry (Brew 2003; Hattie & Marsh 1996; Healey & Jenkins, 2009). In an early study of academic writing, Horowitz (1986) analysed fifty-four writing assignments from seventeen departments of an American university and identified seven categories of writing tasks expected of students: summary of/reaction to a reading, annotated bibliography, report on a specified participatory experience, connection of theory and data, case study, synthesis of multiple sources and research project. One finding was that much of what students need to write, particularly in upper division undergraduate and graduate level courses, is specifically tied to their disciplines. The results of Ebenezer, Kaya and Ebenezer's (2011) study, which analysed research papers based on environmental studies conducted at the interface of classroom and community, indicated that students' abilities to conduct scientific inquiry for seven out of eleven criteria were at the proficient level. In Boscolo, Arfe and Quarisa's (2013) experimental design research, which aimed at improving academic writing, the results showed an improvement in students' ability to write a synthesis, whereas their beliefs about writing were only partially affected by the intervention. The results of Wischgoll's research (2017) revealed that a text structure knowledge application strategy affected academic writing skills positively; that feedback related to the students' writing experiences resulted in higher text quality; and that undergraduates benefited from informative tutoring feedback while postgraduates gained from try-again feedback. Brew (2017) examined several studies. These included studies that examined students' views of research (Hajdarpasic, Brew & Popenici, 2015), researched the visibility of research on campus (Popenici & Brew, 2013), engaged undergraduate students in pedagogical research (Brew & Jewell, 2012) and examined the outcomes of undergraduate research experience programmes (Brew & Jewell, 2012). These studies' discussions suggest that the role of the supervisor and the relationship between supervisor and student are essential factors in a positive research experience. Hence, the attitudes and views of the supervisor are critical and require special attention in an investigation of the constraints in implementing undergraduate research experiences.

A review of the related literature found that studies which examined practical research education and its effects as part of research methods courses were almost non-existent. Therefore, the main purpose of this study was to examine the effects of research education provided in research methods in education courses on students' research report writing skills. Answers to the following questions were sought:

- (1) What is the effect of research education in "Research Methods in Education" courses on the writing of research report introductions?
- (2) What is the effect of research education in "Research Methods in Education" courses on the writing of research report methods sections?
- (3) What is the effect of research education in "Research Methods in Education" courses on the writing of references sections?

## METHODOLOGY

### Research Design

The research aims to determine the effect of the “Research Methods in Education” course on the students' ability to write research reports. The method chosen for this study was case study. Case studies focus on program, event, or activity involving individuals rather than a group per se (Stake, 1995). In this context, convenience sampling method was chosen and the students who were taking “Research Methods in Education” course attended the research voluntarily.

### Participants

The universe of the research was formed of students studying in the Faculty of Education of a foundation university in Turkey. No sampling method was used, and 100 students who took the “Research Methods in Education” course formed the participants. Before the process, seven students stated that they didn't want to be a part of the research and finally 93 students formed the last participants voluntarily. During the sampling process, a code (e.g. R1, I5, O13) identified all the students who were enrolled in the course at the beginning of the four-week education period, and the students who participated in the entire four-week education period were determined by looking at their codes. Four departments (Early Education Programme, Guidance and Psychological Counselling Programme, English Language Teaching Programme and Special Education Training Programme) in the sample require this course for their students in the fourth semester of the academic schedule.

### Data Collection and Data Analysis

In this study, the effect of the research education on the students' writing skills was examined, and the data were obtained from the research reports. The research education was carried out within the scope of the course conducted throughout the term taught by the researcher for four weeks. In the first lesson of week one, which introduced research education, determining the research topic, writing the research problem and sub-problems, the importance of the research, the rules and framework of writing, and the assumptions and limitations were discussed. In the week's second lesson, the students were asked to write the subtitles for an Introduction section after considering a problem in their field that they considered important. During the second week, under the main heading of research methods, research designs, universe-sample-sampling methods and the preparation of data collection tools were all introduced. Then, in the third week, students were asked to develop and report a research method in accordance with the previously determined research subject. In the fourth week's first lesson, in-text and end-of-text citation rules were introduced according to the APA style, followed by the second lesson, which asked students to correctly write a bibliography. The steps of data collection and Conclusion were not included in the course instruction because the students' research was only at the design stage.

The data of the research was collected by research reports during courses. The rubric developed by the researcher was used (see Appendix 1) before evaluating the research reports. During the development of the rubric, previously prepared rubrics (Annenberg Media, 1997 -2007; Connecticut State Department of Education, 2010; Ebenezeer, Kaya & Ebenezeer, 2011; Oliphant Science Awards, 2010) were examined, the items in the rubric were developed according to the characteristics of the relevant sample group and a three-point (sufficient/partially sufficient/not sufficient) rating scale consisting of thirteen criteria was prepared. Also, while the two rubrics were created, the opinions of a measurement and evaluation expert's opinions were obtained and the form was edited in line with the suggestions. The reliability of the data was ensured after the researcher and a measurement and evaluation expert created their own items in the rubric. The formula (Reliability Formula= $\frac{\text{Consensus}}{\text{Consensus}+\text{Dissensus}}$ ) of Miles and Huberman (1994) was used for the reliability, and the similarity coefficient ( $\frac{24}{24+2}$ ) was calculated as .92. The skills that meet the criteria can be seen in Appendix 2.

To calculate the reliability of the scores obtained by the researcher from the rating scale, a measurement and evaluation specialist was asked to do the scoring. Finally, an inter-scorer reliability coefficient of .96 was calculated, and this coefficient score was considered adequate (Miles & Huberman, 1994).

## FINDINGS

In this section, there are findings of the effect of research education on students' ability to write research reports. Both quantitative and qualitative findings were presented. The findings were presented according to the sub-problems of the research.



## The Effect of Research Education on the Writing of Introduction

The frequency and percentage values table of writing the introduction part of research reports carried out in the first week are as follows:

**Table 1:** Frequency values regarding the effect of research education on students' ability to write introduction

	Sufficient		Partially Sufficient		Insufficient	
	f	%	f	%	f	%
Does the title of the proposal represent the research?	f= 45	%=48	f= 21	%=22	f= 27	%=30
Are the suggested keywords appropriate and sufficient?	f= 25	%=27	f= ---	%=---	f= 68	%=73
Is the purpose of the study adequately explained in the proposal?	f= 80	%=86	f= 7	%=7,5	f= 6	%=6,5
Have the theoretical basis and research area of the proposal been specified?	f= 48	%=52	f= 23	%=25	f= 22	%=24
Does the proposal explain the importance of the study?	f= 63	%=68	f= 25	%=27	f= 5	%=5
Are possible assumptions specified in the proposal?	f= 80	%=86	f= 10	%=11	f= 3	%=3
Are the possible limitations mentioned in the proposal?	f= 80	%=86	f= 10	%=11	f= 3	%=3

After evaluating the subheadings under the main heading of introduction, it can be said that as a result of the quantitative findings, the purpose of the research ( $f=80$ ,  $\%=86$ ), the assumptions ( $f=80$ ,  $\%=86$ ) and the limitation ( $f=80$ ,  $\%=86$ ) developed sufficiently. It was observed that the students wrote at least the keywords ( $f=23$ ,  $\%=27$  sufficient). In general, it can be said that the student's skills in writing the introduction to the research report have improved positively. In addition to the quantitative findings, qualitative findings were also examined.

The titles of the studies conducted by the students O23, O25, R5, and O1 are as follows:

O23: *'Investigation of teacher candidates' attitudes towards children with intellectual disabilities'*

O25: *'The effect of socio-economic status of families on student achievement'*

R5: *'Peer bullying in adolescents and its impact on relationships at school'*

O1: *'Examination of the views of preschool teachers on inclusive education'*

The topics selected by the students for the study were found sufficient. To evaluate whether the purpose, importance, assumptions, and limitations of the studies were in accordance with the research topic, quotations of students' views are presented below with the same code. The aim of the study, assumption and limitation writing skills were found sufficient, whereas keyword writing was found insufficient. Examples of statements based on quotations from study reports are given below:

Writing research assumptions:

O23:

1. *The selected method is suitable for the study.*
2. *The answers given to the questions in the questionnaires of the research reflect the truth.*

O25:

1. *The contribution of the socio-economic level of the families to the education of the children was considered equal.*
2. *It was assumed that the answers given to the questions by the children and families were correct.*
3. *It was considered that the socio-cultural status of the families affects the success of the individuals and their social environment.*

R5: *It was assumed that the adolescent students participating in the research gave sincere and correct answers to the questions in the "Taunting and Bullying Scale School Form", "Parent Adolescent Relationship Scale", and "Peer Relationship Scale".*

O1:

1. It was assumed that the teachers responded to the "Personal Information Form" and the "Attitude Scale Against Integration" form sincerely and correctly.
2. Statistical methods used in data analysis were chosen in accordance with the purpose of the study.
3. It was assumed that the sample selected in the study represents the population.

When keyword writing was examined, it was seen that keywords were included in the report of R5 only, while they were not included in the reports of other students. The keywords in the study coded R5 are as follows:

*"Parental relations, Adolescence, School life, Bullying"*

### The Effect of Research Education on Writing of the Methods

As a result of the method, education carried out in the second week, the frequency and percentage values table for the research reports during the third week is as follows:

**Table 2:** Frequency values regarding the effect of research education on students' ability to write methods

	Sufficient		Partially Sufficient		Insufficient	
	f	%	f	%	f	%
Was the research design of implementation appropriately selected in the proposal?	f= 55	%=59	f= 27	%=29	f= 11	%=12
Is the possible universe/sample specified in the proposal?	f= 51	%=55	f= 28	%=30	f= 14	%=15
Is the possible sampling method selected appropriately in the proposal?	f= 47	%=51	f= 21	%=23	f= 25	%=27
Have possible data collection tools been introduced in the proposal?	f= 35	%=38	f= ---	%=---	f= 58	%=62

After evaluating the subheadings under the main heading of the method, it can be said that, students' ability to determine the appropriate research design ( $f=55$ ,  $\%=59$ ) and to select samples using the appropriate sampling method ( $f=47$ ,  $\%=51$ ) has improved. In addition, by examining which research design they adopted as method of research they designed, it was determined that they designed research with a quantitative design in 42 reports and a qualitative study in 40 reports. However, a total of 68 reports indicated which sampling method was planned to be used. When the types of sampling methods are examined one by one, it has been stated that sampling will be done with simple random sampling method in 20 reports, stratified sampling method in 8 reports, cluster sampling method in 6 reports, purposive sampling method in 17 reports, maximum diversity sampling in 8 reports, criterion sampling in 4 reports, convenient sampling in 3 reports and 1 systematic sampling method. In writing of possible data collection tools, it was seen that students ( $f=35$ ,  $\%=38$ ) explained how to develop data collection tools that they thought they could use in their research. In this context, it can be said that method education has a positive effect on the development of students' method writing skills.

When the reports regarding the writing of the method section of the research were examined, the skills of the students in the writing of the sections such as the methodology of the research, the universe-sample-sampling, and identification of the sampling methods were found sufficient. Quotations from randomly selected student reports are given below:

Student coded E14 designed a study titled "*Problems faced by students whose native language is not English when learning a foreign language.*" The student described the purpose of the study as "*This research can be considered a supportive study towards improvement by identifying the problems in written expression and contributing to the language learning process.*" The student described the research design as "*general scanning model*". The process of determining the universe and sample was described as follows: "*The universe of this research consists of lecturers at private and public universities in Istanbul. The sample will be determined by simple random sampling among these lecturers. 50 people will be chosen randomly from public universities, and 50 people from foundation universities.*"

Student coded O6 designed a study titled "*The relationship between preschool teachers' views on creativity and students' creativity performance.*" The student described the purpose of the study as "*The aim of this study is to investigate the effects of preschool teachers' views on creativity on students' creativity and its relationship with the scores from creativity sub-dimensions.*" The student described the selected research design as "*relational scanning model*". The process of determining the universe and sample was stated as "*The universe of the study consists of the kindergarten students of the Pendik district of Istanbul. The sample consists of a total of 64 female and 50 male students in 2 kindergartens affiliated with Mustafa Karuşağı Primary School, 2 kindergartens affiliated with Kurtköy Primary School, in 2 kindergartens of the Orhangazi Primary School and 8 preschool teachers in total.*"

Student coded R2 designed a study titled “*The effect of attention deficit on student motivation.*” The purpose of the study was stated as “*In the research, after noticing the attention deficit in the student, it was aimed to reduce the visual and sensory distractions and to increase the motivation of the student by providing the service for the student.*” The research design was described as “*This research was designed according to the phenomenological pattern which is one of the qualitative research methods. A phenomenological design was used because the concepts such as attention deficit, achievement, and motivation are phenomena that we know about but cannot elaborate, and interviews were conducted with guidance and psychological counsellors who are experts in the field.*” The process of determining the universe and sample was described as “*typical case sampling was used in this study. Interviews were planned with teachers working in district schools.*”

These cases, randomly selected from the student reports, show that the students were able to write the research method in accordance with the purpose of the research they designed. However, student skills were found insufficient in the section on the introduction of data collection tools. When the work of the students given as examples above were examined, it was seen that only the student coded O6 among the students coded E14, O6, and R2 explained the data collection tools. The student's statements are as follows:

O6: “*Torrance creative thinking test, Student demographic information form, Teacher demographic information form, and Opinion forms on creativity were used as data collection tools in the research.*”

### The Effect of the Research Education on the Writing Of References

The frequency and percentage values table of the research reports as a result of the references writing education carried out in the fourth week are as follows:

**Table 3:** Frequency values regarding the effect of research education on students' ability to write references

	Sufficient		Partially Sufficient		Insufficient	
	f	%	f	%	f	%
Have enough relevant resources been used?	f = 39	%=42	f = 37	%=40	f = 17	%=18
Are the works cited in the bibliography specified according to APA standards?	f = 23	%=25	f = 17	%=18	f = 53	%=57

After the research education, skills of students in writing references correctly ( $f=23$ ,  $\%=25$ ) were not sufficient as a result of the findings. This can be interpreted as the fact that research education is not useful in this part of education or students do not pay attention to the appropriate references rules.

The student skills were found insufficient in writing the references section, which is the last section taught in research education. Majority of the students cited sources without paying attention to references writing according to the APA style writing rules or did not write a references section at all.

## DISCUSSION

In this study conducted with students who are taking the “Research Methods in Education” course, the effect of the course over a four-week period on the ability of the students to write reports was examined. When the study's findings are generally evaluated, it can be said that providing research education within the scope of a related course contributes to students' ability to write research reports. That such instruction should be done in this context to develop students' writing skills has also been reported in other studies. While it is unrealistic to believe that after four years of study a student will have mastered academic writing, writing skills can be honed with practice and will be beneficial for the rest of a student's life (Preez & Fosey, 2012; Whitehead, 2002; Wischgoll, 2017; Zue, 2004).

The findings of this and related studies suggest that the ability to write academically, a skill necessary in the academic world, can be acquired via writing instructors or a lecturer in a discipline. The process of gaining such skills can be carried out in an academic writing course or within the scope of a course such as scientific research methods. In Wischgoll's (2017) study, which tested training in writing strategies (in-text structure application, summarization and language use) and the provision of feedback for revising (i.e. informative tutoring feedback or try-again feedback) in combination, it was revealed that a text structure knowledge application strategy affected both undergraduate and graduate students' academic writing skills positively, as did the use of learning journals. Ebenezer, Kaya and Ebenezer's (2010) study tested students' scientific inquiry abilities on defining a scientific problem, formulating a statement of purpose and/or scientific question, and formulating a hypothesis. The students' mean scores were high. reflecting that they had acquired skills in these areas through completing a project. These results overlap with those of a study by Saracaloğlu et al. (2005), which examined the relationship between scientific research competencies and several variables with postgraduate students. They found that the higher the scientific research competencies of the students, the lower their scientific research concerns. Aksu (2018) revealed

that music teacher candidates considered scientific research to be the field of activity of academicians and that teacher candidates who wanted to become academicians should take the "Research Methods in Education" course, which they believed contributed to enabling teacher candidates to write scientific articles. In a study by Küçükoğlu, Taşgin and Çelik (2013) conducted with teacher candidates studying in the Department of Guidance and Psychological Counselling, it was concluded that it was not necessary for teacher candidates to conduct scientific research, but that scientific research would be useful for their professional lives.

Looking at the common findings of studies carried out with different samples, it can be observed that the courses in which scientific research methods are taught contribute to arousing students' curiosity about science and developing their scientific process skills. The findings on students' purposes, sub-purposes, and importance statement writing skills at the research design stage are supported by other studies in the literature. In Wischgoll's experimental pre-post-test intervention study (2017), a significant difference in academic writing skills, text quality, summarization skills and text content improvement from draft to abstract between experimental groups and a control group was found. Boscolo, Arfe and Quarisa (2007) determined that an intervention aimed at improving academic skills, especially synthesis writing, improved participants' ability to write a synthesis. Ersoy and İncebacak (2016) and Akın (2017) both concluded that the scientific research methods course improved the ability to write the introductory part of articles. Furthermore, both studies revealed that, after the students took the course, they showed improvements in their approach to handling a scientific problem and that the course had changed the students' perceptions of scientific problems in a positive way. Çetin and Dikici (2014), after evaluating the effectiveness of the "Research Methods in education" course taken by postgraduate students, concluded that the course met expectations in terms of method-technique, research questions, data collection tool determination and literature review.

According to the above research findings, it can be said that the ability to determine the appropriate research design and sampling method has improved in the research method writing composed after scientific research education. This indicates that the education provided achieves effective results, especially by making methodology, which is accepted as the backbone of research, meaningful for students. That training courses related to research methods, in which students gain familiarity with the steps of addressing and analysing a problem, contribute to their ability to write an academic text are supported by the results of this and similar studies (Akın, 2017; Boscolo et al., 2007; Çetin & Dikici, 2014; Ersoy & İncebacak, 2016; Preez & Fosey, 2012; Tomakin, 2007; Whitehead, 2002).

Regarding the effect of research education on students' ability to write and organize references, it was concluded that the education was not effective, as it was observed that the students were inadequate in citing references according to the adopted APA style. In addition, when the sources used by students were examined, 332 of the 334 sources were national ones. It appears that the students were unable or unwilling to read articles written in a foreign language. Failure to comply with the APA (7<sup>th</sup> edition) rules for indenting in Reference sections, i.e. writing with the first line left and the second line indented, could be interpreted as students not paying much attention to that aspect of research reporting. This observation aligns with the research findings of Çetin and Dikici (2014). In their study, the course's lectures, course duration, and teaching were found to be insufficient at solving problems in terms of report writing and data analysis following the APA style. However, in the academic discourse community, it is necessary for writers to cite external sources, formally acknowledging the source of other writers' words and thinking. Pecorari (2006) explained that, unless the reference works that informed an academic text were properly cited, it lacked academic worth or credibility. Manan and Noor (2015) maintained that "citations are one of the crucial parts in academic writing where having the linguistic proficiency alone is inadequate and it has to be substantiated with the knowledge of citation as well". Emphasizing this, Borg (2000) warned that failure to appropriately cite sources can result in serious academic consequences and that in some cases the writers may be accused of intellectual dishonesty. For these reasons, it is vitally important for writers to recognize "what" to cite and to know "how" to cite others' works (Swales, 2004). Another study that overlaps with the findings of this study is Kongpetch's (2021). In his "Use of Citation Forms in Academic Writing of Thai Undergraduates", he revealed that the students could not appropriately and skilfully integrate sources into their texts. Their major problems were caused by the following two factors: (i) lack of familiarity with the language of citations and (ii) unawareness of the dialogic nature of academic writing. This problem was shown to arise because the students cited sources mainly to acknowledge the external authors' works and validate their (as the authors) knowledge claims, but did not evaluate previous research (Luzon, 2015).

## CONCLUSION AND IMPLICATIONS

As the above studies show, the inclusion of the "Research Methods in Education" course in teacher training programs is very necessary for students to understand the nature of scientific research and for them to productively engage in academic writing. In addition to being prepared for the processes of conducting scientific research and



writing a thesis, it is a necessary course for those students who want to continue their academic careers after getting a bachelor's degree. At this point, it can be suggested that the effects of different variables on academic research writing skills can be examined by designing experimental or phenomenological studies and that the variables that researchers are unaware of can be revealed through interviews. This would enable the results of different studies to be discussed. According to another finding of the study, the students were considered inadequate at correctly following reference writing rules. In order to enrich students' preliminary writing format knowledge, it can be proposed that the "Information Technologies" course given in the first year of the Faculties of Education in Turkey focus more on references writing and on checking students' compliance with the references writing rules in their homework and projects for all their courses.

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## Appendix 1.

### RESEARCH PROPOSAL EVALUATION FORM

	Sufficient	Partially Sufficient	Insufficient
1. Does the title of the proposal reflect the research?	The title is fully compatible with the subject of the proposal.	The title does not fully cover the subject of the proposal and it should be corrected.	The title is not relevant to the subject of the proposal.
2. Are the keywords in the proposal appropriate and sufficient?	The number of keywords and their relation to the subject are sufficient.	Keywords are relevant to the subject but not sufficient in terms of number.	Keywords are not relevant to the subject.
3. Has the purpose of the study been sufficiently explained in the proposal?	The purpose and sub-goals of the study have been clearly mentioned in the form of questions or hypotheses.	The purpose of the study has been clearly stated, but sub-goals are not mentioned.	The purpose of the study has not been mentioned, nor the purpose is relevant to the subject.
4. Have the theoretical basis and research area of the proposal been specified?	The relevant literature of the study has been discussed in depth.	The relevant literature of the study has been briefly mentioned.	The relevant literature of the study has not been mentioned.
5. Has the significance of the study been explained in the proposal?	The contribution of the study to the literature and/or readers has been clearly explained.	The significance of the study has been mentioned, but the areas of its contribution have not been explained.	The significance of the study has not been mentioned.
6. Have possible assumptions been specified in the proposal?	Possible assumptions have been included in the proposal sufficiently.	Possible assumptions in the proposal are partially sufficient.	Possible assumptions have not been included or they are insufficient.
7. Have possible limitations been specified in the proposal?	Possible limitations have been sufficiently included in the proposal.	Possible limitations in the proposal are partially sufficient.	Possible limitations have not been included or they are insufficient in the proposal.
8. Has the proposed research	The possible research	The name of the research design has	The research design has not

design been specified in the proposal?	design has been specified with justification in the proposal.	been mentioned without justification.	been specified or not compatible with the research subject.
9. Has the possible population/sample been specified in the proposal?	The possible population/sample has been specified with justification in the proposal.	The possible population/sample has been mentioned without justification.	The population/sample has not been specified or not compatible with the research design.
10. Has the possible sampling method been selected appropriately in the proposal?	The possible sampling method has been specified with justification in the proposal.	The sampling method has been mentioned without justification.	The population/sample has not been specified or not compatible with the research design.
11. Have possible data collection tools been introduced in the proposal?	Possible data collection tools have been introduced in the proposal.	Possible data collection tools (have been introduced partially).	Possible data collection tools have not been introduced.
12. Have sufficient sources of appropriate quality been used?	The sources used in the proposal are up-to-date and have been compiled from the national and international literature.	The sources used in the proposal are up to date, but often compiled from national publications.	References have not been included in the proposal.
13. Have the works cited in the references specified according to APA standards?	The works in the references have been specified in accordance with the APA spelling rules.	Some of the works in the references have not been specified according to the APA spelling rules.	The works in the references have not been specified according to the APA spelling rules.

## Appendix 2.

Criterion 1: Does the title of the proposal reflect the study? The title of the study chosen for the research subject should be related to the subject and reflect the subject.

Criterion 2: Are the suggested keywords appropriate and sufficient? The given keywords should be in a sufficient number (5-6 words) and related to the research topic.

Criterion 3: Is the purpose of the study sufficiently explained in the proposal? The purpose and sub-objectives of the study should be clearly written in the form of question sentences or hypotheses.

Criterion 4: Are the theoretical basis and research area of the proposal specified? The relevant literature of the study should be discussed in-depth and related studies should be included.

Criterion 5: Has the importance of the study been explained in the proposal? In the proposal, the contribution of the study to the literature and/or readers should be explicit and clearly stated.

Criterion 6: Are possible assumptions specified in the proposal? In the proposal, it is necessary to include the possible assumptions adequately.

Criterion 7: Have possible limitations been specified in the proposal? In the proposal, it is necessary to include sufficient space per the possible limitations.

Criterion 8: Has the proposed research design been explained? The proposal should explain the rationale for how the possible research design was chosen.

Criterion 9: Is the possible universe/sample specified in the proposal? In the proposal, the possible universe/sample should be stated along with its justification.

Criterion 10: Is the possible sampling method mentioned in the proposal? In the possible sampling method should be stated together with the justification.

Criterion 11: Have possible data collection tools been introduced in the proposal? In the proposal, possible data collection tools should be introduced gradually.

Criterion 12: Are adequate sources of appropriate quality used? The sources used in the proposal should be compiled from the national and international literature according to the actuality.

Criterion 13: Are the works cited in the bibliography specified according to APA standards? All the works in the bibliography must be shown in accordance with the APA writing rules.