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The effect of "journey to literature survey and review" training on the research competencies of master students*

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ABSTRACT

In order to carry out effective research, Master's degree students are expected to have a good command of the literature. They need to know how to carry out a literature review and how to synthesise the studies found as a result of the review and turn them into an article if desired. As the shortcomings made at this stage will affect the whole process of research, students should be given the necessary training. This study aims to examine the effect of "Journey to Literature Survey and Review" training on Master's degree students' research competencies. An embedded mixed methods design was used in this study. The study is part of the "Journey to Literature Survey and Review" project conducted under the TUBITAK 2237-A Grant Program for Scientific Training. The study group of the research was determined using the purposive sampling method. The study group consisted of 33 Master's degree students from different universities and education departments. In the training information on how to conduct a literature review and present the studies obtained was delivered theoretically and practically. The experimental implementation process was carried out in the form of 6-day and 8-hour daily training sessions. The training sessions provided detailed information on what a literature review is, how to search databases, and types of reviews. These sessions were conducted by 12 academics who are experts in their fields. The "Competence in Research Scale" and "Opinion Form" were used as data collection tools in the study. The results of the study showed that the research competencies of the students increased significantly with the application. Looking at the averages for the sub-dimensions, it is clear that there is a large increase in the literature review and methods dimensions in particular. In this context, it can be suggested to increase similar training on sub-dimensions that will improve research competencies.

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Introduction

Universities not only educate students in their disciplines but also prepare them for research and a research culture. The creation of a research culture begins in the undergraduate education process and continues in the graduate education process, where research becomes one of the basic competencies. Abdulai and Owusu-Ansah (2014) state that students studying at both undergraduate and postgraduate levels in academic institutions (especially universities) are required to conduct independent research and submit a thesis or dissertation as part of the requirements for academic

degrees. At this point, particularly at the postgraduate level, conducting research and achieving each stage of research is an important part of completing education and training.

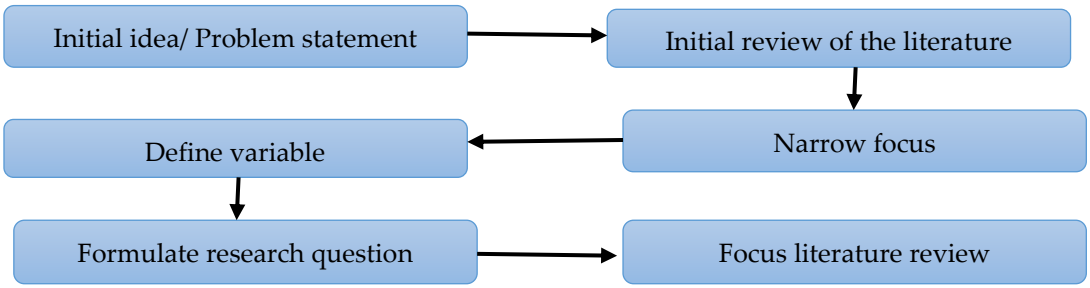
In order for individuals to conduct research and complete the process successfully, they need to know and correctly follow the steps of the research process. However, many mistakes tend to be made in the research process. Toy and Tosunoğlu (2007) state that errors related to conceptual and methodological studies are common in scientific articles. Erdoğan (2001) concluded that articles lacked academic value and scientific validity in terms of purpose, significance, theoretical framework, rationale, hypothesis and research preparation and presentation, data collection method, use of statistics, results and evaluation, and drawing conclusions by establishing a connection between the basic elements of a research. Çepni (2021) states that the reasons for rejection in indexed journals are generally that "the theoretical framework" and "conceptual framework" of the article have not yet been established or "the contribution to the existing literature based on the theoretical framework could not be revealed". In fact, in this case, it occurs in parallel with the person's mistakes in scanning the literature or not scanning it sufficiently. In his analysis, Karadağ (2010) found that the general quality level of the research models used in the dissertations was inadequate, and the types of mistakes made were the incompatibility of the model used with the main purpose of the research, the presence of naming errors, the presence of explanation errors related to the model, and the omission of the model. Lederman and Lederma (2015) found that the lack of a theoretical framework was the most frequently cited reason for not publishing an article, except for poor validity and/or reliability of data collection measures or lack of availability. The weakest aspects of scientific studies, especially those written by young researchers, tend to be the conclusion and discussion sections (Çepni, 2022). As it can be understood, there are errors in almost every stage of a scientific study. Especially, an error in the literature section will affect the whole process.

Before conducting research, students have a responsibility to find out what is already available in the area they wish to research (Hart, 1998). In other words, to conduct research on a topic, a literature review must first be conducted. As Knopf (2006) notes, literature reviews are conducted in one of three contexts: a literature review can be an end in itself; it can be a preliminary stage in a larger research project; and it can be a component of a completed research report. Whatever the purpose, a literature review is an important part of research and individuals need to be able to analyse the literature well. As Oliver (2012) states, the literature review is generally recognised as an important part of student projects, research studies, and dissertations.

A literature review is the examination of scientific articles, books, and other sources related to a specific topic, research area, or theory, thus providing a definition, summary, and critical evaluation of these studies (Ramdhani, Ramdhani & Amin, 2014). Çepni (2018) defines a literature review as a way of collecting and analysing documents such as articles, pictures, and photographs related to the subject of research according to certain systematics. In other words, the literature review is the literature summary, synthesis, and analysis of the information related to the research problem (Balcı, 2016). As it can be understood, the literature review is the scanning of the studies (books, articles, writings, etc.) in the literature related to the determined subject and analysing and synthesising them with a critical perspective. The general framework of the literature review is presented in Figure 1.

Figure 1

Basic Literature Review Process

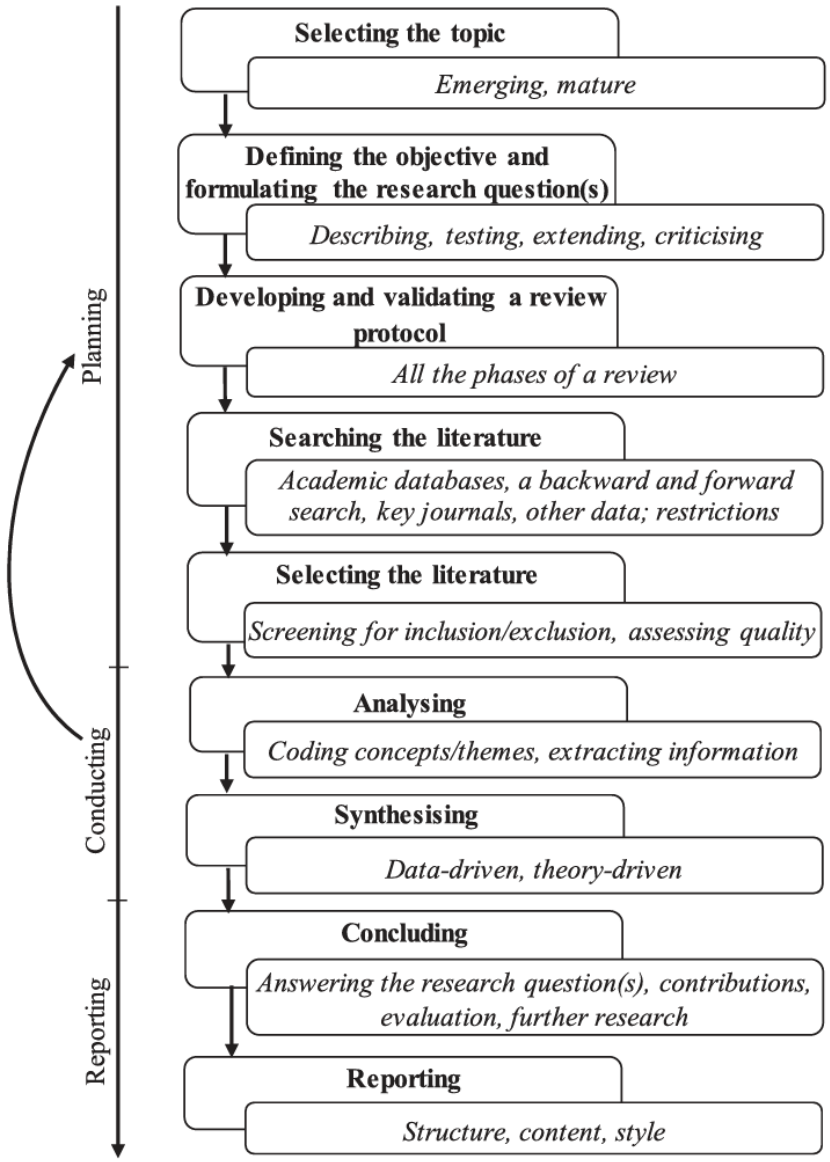


Note. Frederiksen & Phelps, 2018

As can be seen in Figure 1, the process starts with an idea and a problem, and a focus is determined by reviewing the relevant literature. Variables parallel to this focus are defined and our research problem emerges and the literature review begins. However, the literature review process is summarised by Juntunen and Lehenkari (2021) as shown in Figure 2:

Figure 2

The Literature Review Process in the Existing Literature



Note. Juntunen & Lehenkari, 2021

As can be seen in Figure 2, after determining the topic and research problem, a literature review begins. After scanning, the necessary sources are selected. This stage is important because the individual needs to distinguish the studies that serve the purpose. As Demirtaş (1989) states, the most important thing for the individual is not what is taught, but teaching what, how, and from which sources they will learn for what purpose, and making the right choice among multiple sources. After identifying the correct and purposeful articles, they are analysed, synthesised, and presented.

A literature review discusses information published in a particular subject area and sometimes in a particular subject area over some time (Ramdhani et. all., 2014). Therefore, a literature review is expected to serve the following purposes in research (Hart, 1998)

- To distinguish what has been done from what needs to be done;
- To discover important variables related to the topic;
- To synthesize and gain a new perspective;
- To define the relationships between ideas and practice;
- Establish the context of the issue or problem;
- Rationalize the significance of the problem;
- Acquire and develop vocabulary related to the subject;
- Understand the structure of the subject;
- Relate ideas and theory to practice;
- Identify the main methods and research techniques used;
- Place research in a historical context to become familiar with recent developments.

As it can be understood, literature review is effectively used in all research from the beginning to the end of the study. However, literature review can be used for different purposes, such as creating a conceptual framework, finding new approaches, identifying current research, learning about important studies and people, comparing the results obtained, and identifying the gaps in the field.

Graduate students conduct literature reviews primarily to get to know the field, to master the subject they want to study and to decide on the problem they want to study. As Oliver (2012) states, by examining previous research on a topic, an individual can identify areas that have not yet been explored, suggest topics for future research projects, and also provide a specific focus or line of thought for our current dissertation. Indeed, to write an effective dissertation, students need to have a solid understanding of the literature review (Shahsavar & Kourepaz, 2020). This is because, without a systematic search and critical reading of the literature, it is very difficult to see how academic research can make a new application of a methodology or contribute to knowledge in any way, no matter how small (Hart, 1998). For this reason, the first step in research and project is a literature review.

A literature review is not only a preliminary preparation for theses and projects, but it can also be prepared to present the analysis and synthesis of studies in a field, i.e. to write a review article. Moreover, as Ramdhani et al. (2014) point out, a literature review is different from an academic research paper. The focus of an academic research paper is to develop a new argument, and a research paper will include a literature review as one of its sections. However, the focus of a literature review is to summarise and synthesise the arguments and ideas of others without adding anything new.

Whatever the purpose of the literature review, it should be noted that there are similar processes. However, as Hart (1998) states, regardless of the level of experience of the researcher, he/she is expected to review the literature in his/her field. Conducting a literature review can be difficult even for an experienced researcher (Knopf, 2006). This is because as technology develops, the number of resources and databases increases, and, in parallel, individuals need to be more adept in both searching and analysing the studies they receive. In the study by Akbulut, Şahin, and Çepni (2013), the participants stated that they had difficulties in identifying a dissertation topic and accessing resources. Literature reviews can be daunting and difficult to write, especially for novice and early-career researchers (Pickering, Grignon, Steven, Guitart & Byrne, 2015). The reason for this situation can be explained by not knowing enough about literature reviews and not being able to master the literature (Barutçu & Onaylı, 2016). Similarly, Hart (1998) stated that it has become an annual ritual for graduate researchers to be asked for a literature review, and they generally want to know what a literature review looks like and how they should do it. In this context, although a literature review is an important step in research (Poyrazlı & Şahin, 2010), it can be a step that involves many problems even though it seems simple. The main point to keep in mind is that a review should provide the reader with a picture of the state of knowledge and fundamental questions about the topic, even if it is

limited to a short project (Bell & Waters, 2018). Although this may seem simple, it is a long process with different challenges at each stage.

Another important difficulty that arises after access to the studies in the literature is the analysis and synthesis of the studies. One of the shortcomings and mistakes made at this stage is the direct presentation of the studies obtained as a result of the searches. This situation is particularly common in graduate theses. It should not be forgotten that listing the studies in the literature one after the other is not an analysis and synthesis. Furthermore, as Kwan (2006) notes in his study, the terms 'introduction' and 'literature review' are often used interchangeably in dissertation guidelines and writing programmes, but there are visible structural differences between the literature review and the introduction in research writing. As Şahin, Calp, Bulut, and Kuşdemir (2013) stated, mistakes in the introduction, problem statement, assumptions, definitions, and limitations in research lead to many inconsistencies in method, sampling, identification of subjects, and data collection. For this reason, the importance of a more comprehensive literature review becomes apparent (İsnaç & Doğan, 2017). At this point, to conduct an effective literature review, all students should be trained to collect appropriate data for a specific purpose and develop information literacy skills (Leite, Padilha & Cecatti, 2019).

In terms of graduate courses, there are some research courses to improve students' research skills/competencies. Research competencies can be expressed as a component of research techniques, statistics, measurement-evaluation and computer skills (Büyüköztürk, Ş., & Köklü, N. (1999). In other words, they are the skills/competencies required for each stage of a research process. In order to acquire these skills/competencies, research courses are needed. Because, as Toy and Tosunoğlu (2007) stated, the main reason for errors in scientific articles is that the scientific research process is not sufficiently known. The aim of the research course is already to develop research skills, provide training in writing a dissertation and improve the presentation skills of graduate students (Bayona-Ore, 2021). A similar situation applies to literature survey and review. Because there is generally no specific course on literature survey and review. In Master's degree programmes, some universities have a course on scientific research methods as a compulsory course and some as an elective course. Considering the content of this course, one week (2-3 hours on average) can be devoted to a literature review. In other words, general information can be given in this course content. As stated by İsnaç and Doğan (2017), the importance of the ability of students in Master's and Doctoral programmes to conduct scientific research and the need to include courses on scientific research in these programs become apparent. At this point, considering that each researcher in graduate education carries out the literature review part, it can be assumed that the deficiencies in this part affect the whole academic life. If the literature review is not carried out correctly and successfully, students will not have a good command of the field and will not be able to fully appreciate the rationale or originality of their studies. Research carried out without mastering the field tends to be repetitive, and the contribution of the study to the field remains very low. On the other hand, if a person effectively scans the literature and reaches all the studies, he/she both knows the field and has a much clearer idea of the study or studies he/she needs to do. In addition, a person who effectively synthesises the literature after the literature review will have information about each stage of the study. For example, how the application process is carried out in studies, what to consider, how to ensure validity and reliability, and even how to write the article. This helps the individual not only to master the field, but also to have knowledge about research processes. In addition, an individual undertaking a study of the literature review process will have carried out each step of the research. The student will analyse, summarise and synthesise the articles he/she has obtained, depending on the research problem he/she has set, and present the findings.

Considering that literature searches and reviews contribute to the mastery of the subject and to the academic development of postgraduate students, the importance of the studies to be carried out for this purpose becomes clear. This study examined theoretical and practical information on how to conduct a literature review, how to present the studies obtained as a result of the review, i.e. how to conduct a literature review, and the impact of this training on the research skills of graduate students.

At this point, the main difference between the programme and other programmes or postgraduate courses is that it is student-centred and all processes are covered in detail. In terms of being student-centred, the courses within the scope of the study were either case method or applied. The case method is supposed to provide learning by solving problems encountered in real life in the classroom environment (Ayas, Çepni & Ayvacı, 2014; Çamur, 2008). During the training, each relevant lesson was followed up with sample articles. In this context, the case study method, which allows theoretical knowledge to be enriched with practical life examples, contributes significantly to the preparation of participants for professional life (Şahin, Atasoy & Somyürek, 2010). In applied courses, it is based on the students creating applications on their own computers. The second point that distinguishes the training is that it includes all processes and dimensions related to literature survey and review. An attempt has been made to include all the concepts and topics that students might think of in relation to literature survey and review. In addition, the types of review in the literature, which sometimes cause confusion, have been explained in detail by experts. At this point, similar content can be given in postgraduate courses, but cannot be given by experts in the field as in such training. Academics who teach research courses at universities are experts in the field, but it is not possible for them to know or apply all the issues related to literature survey and review. Many academics may have a better command of the literature review part, but it may not be possible to master all of them because there are too many types in the review part. For example, they may be competent in meta-synthesis but not meta-analysis. From this point of view, the importance of such training becomes clear.

The study investigated the effect of the training programme "Journey to Literature Survey and Review" on the research competiencies of Master's degree students. Some studies in the literature investigated graduate students' research competencies (Akgün & Güntaş, 2018; Özkara, 2018; Saracaloğlu, 2008). However, these studies were generally conducted in the form of surveys and attempted to determine the level of students' research competencies or their relationships with other variables. In this context, it is believed that this study will be important to the literature. In addition, research competiencies are the main variable as they include topics related to a research process within the scope of the trainings. As the training includes research literature review, problem definition, methods related to review studies, analysis and presentation of data obtained from these studies, and the transformation of studies into articles, it was thought that it would be important to examine the effect of the training on students' research competiencies. As this addresses the entire research process, it was thought that it would be important to examine the effect of the training on students' research competiencies. The problem statement of the study is as follows:

- What is the effect of "Journey to Literature Survey and Review" training on the research competencies of Master's students?

Methods

An embedded mixed methods design was used in this study. Embedded mixed method design incorporates qualitative data into the implementation during/after/before a treatment (Creswell & Clark, 2011). The study is a part of the project "Journey to Literature Survey and Review", which is carried out within the framework of TÜBİTAK 2237-A Grant Program for Scientific Training. A pre-test was administered to the participants, followed by a training process, and then a post-test was administered. Quantitative and qualitative data were collected. In this process. students' research competencies before and after the "Journey to Literature Survey and Review" training were measured using a quantitative data collection tool, and their research competencies were explored in depth through interviews. As the effect of the training on students' research competencies was explored in depth through both the scale and the interviews, embedded mixed methods was considered appropriate.

Research Group

A purposive sampling method was used to select the participants for the study. The study group consisted of 33 participants who had a Master's degree in the field of educational sciences and teacher training. The first criterion for the selection of the target group is that the participants are at the Master level. This is because master's students who have just entered academic life should improve themselves in research and scientific report writing and reach a sufficient level in this regard for a successful academic life (Can & Ceyhan, 2015). A master's program with a thesis aims to enable students to gain the ability to access, evaluate, and interpret information by conducting scientific research (Council of Higher Education - YÖK, 2010).

Other criteria for the selection of participants were that they should not have been involved in a study or project similar to this one before, that they should have a high academic GPA, and that they should come from different universities and different departments. Of the 878 candidates who applied for the project and met the criteria, 33 students from different universities and departments were selected. In this context, students continuing their Master's studies at Erzincan Binali Yıldırım University, Kahramanmaraş Sütçü İmam University, Istanbul Sabahattin Zaim University, Yıldız Teknik University, Gazi University, Burdur Mehmet Akif Ersoy University, Hacettepe University, Marmara University, Bartın University, Middle East Technical University, Pamukkale University, Trabzon University, Fatih Sultan Mehmet University, Atatürk University, Dicle University, Boğaziçi University, Muğla Sıtkı Koçman University, Mersin University, Ege University, Anadolu University, Sakarya University, Giresun University, Bursa Uludağ University, Süleyman Demirel University, and Celal Bayar University were preferred as participants. Participants were pursuing master's degrees in physical education, educational programmes and teaching, educational administration and supervision, psychological counselling and guidance, computer education and instructional technology, science education, music education, English language education, mathematics education, special education, lifelong learning and adult education, preschool education, measurement and evaluation in education, Turkish education, teaching Turkish as a foreign language, classroom instruction, and social studies education.

Application Process

The training provided theoretical and practical information on how to conduct a literature review and how to present the studies found as a result of the review. All the processes from scanning a subject to completing the study were handled step by step. The case method was used and the aim was to enable participants to learn in depth by going through sample articles. At this point, the studies (exemplary or erroneous) on literature survey and review were presented to the students and the aim was for the participants to analyze them and arrive at the truth. The articles are usually taken from from high impact journals parallel to the instructor's field. However, care has been taken to ensure that there are complete and incomplete examples related to the subject to be explained in the articles. The aim here is to enable students to analyse the articles related to the relevant review type and to identify appropriate/inappropriate situations. In addition, the question-and-answer method was used throughout the process to enhance communication between the trainer and the participants. The question and answer method was used effectively in almost all lessons. Finally, some of the courses in the process were conducted as application-oriented. At this point, the students continued to work practically on their computers.

The content of the training was prepared by the researcher. Firstly, the need for a literature review was discussed and the students were asked why they needed this training. Then the literature survey phase was started and many databases were scanned. Then the types of reviews were presented emphasising which type of review (review method) will be used for which problem. Each writing method was analysed step by step from scanning to writing. In other words, what should be the research problem in this type of review, how should the process be carried out, how should the

research be conducted, how should the data be analysed, presented and written up? Finally, it was emphasised how to write 'related studies' in dissertations or how to write a review type study. Once this content had been produced, it was reviewed by the academics in the project team and finalised once the necessary arrangements had been made. The training lasted six days and the corresponding explanations are given in Table 1.

Table 1

Implementation Process of "Journey to Literature Survey and Review" Training

Day	Content	Method/technique used
Day 1	General information about the project	Theoretical, question-answer
	Acquaintance activities with drama	Application
	The importance of a literature review	Theoretical, question-answer
	What a literature review is and how it is done	Theoretical, question-answer, application
Day 2	Use of databases	Application
	Types of literature review	Theoretical, question-answer
	Citation and traditional review	Case study
	Meta-synthesis	Case study, question-answer, application
Day 3	Meta-summary	Case study, question-answer
	Use of QDA Miner Lite software	Application
Day 4	Thematic analysis and systematic review	Case study, question-answer
	Meta-thematic analysis and application	Case study, question-answer, application
	Introduction to content analysis using Nvivo	Application
Day 5	Using the Nvivo software	Application
	Meta-analysis	Case study, question-answer
	Application using CMA software	Application
Day 6	Writing a literature review	Case study, question-answer
	Points to consider in the writing process	Theoretical, question-answer
	Evaluation of the program	Question-answer

As can be seen in Table 1, the contents related to literature survey and review were processed step by step each day including appropriate methods. The parts that form the basis of the literature survey and review and contain general information (e.g. the importance of a literature review, types of literature review) were presented according to the theoretical and question-answer method. These sessions were delivered by experts in the field in the form of a lecture with questions to the students at appropriate points. Case study courses are generally those that involve a research method (review type). In these sessions, examples of the method were presented to the students by the lecturer for the students to examine. The teacher then supported the lesson step by step with examples from the articles used. Finally, the application lessons are the part where the scanning or application of the relevant review type is carried out. Databases or an analytical programme were used in this process. In this part each student worked individually and continued the process on their own computer.

The training provided as part of the study was carried out by 12 academics who are experts in their field and who have proven their competencies in the subject through publications in high-ranking journals. As the implementation process of the training took place during the pandemic period, the applications were carried out online. The experimental implementation process was carried out as a 6-day and 8-hour daily training.

Data Collection Tools

The "Competence in Research Scale" and "Opinion Form" were used as data collection tools in the study.

Competence in Research Scale

"The Competence in Research Scale" developed by Büyüköztürk (1996) was used to determine the research competencies of the participants. A five-point Likert-type rating scale was used in the data collection instrument. The scale includes five sub-dimensions: 'problem definition', 'literature review', 'method', 'findings and interpretation', and 'reporting'. This scale consists of a total of 43 items in five dimensions, of which 8 are problem definition, 9 are literature review, 10 are method, 7 are findings and interpretation and 9 are reporting. The alpha internal consistency coefficients for these five dimensions were found to be 0.88, 0.87, 0.88, 0.91 and 0.92 respectively. The alpha coefficient is 0.96 when the scale is considered as a single dimension. In this context, it can be said that the scale is valid and reliable. The measurement tool was administered to the participants twice online, once on the first day and once on the last day.

Opinion Form

This was designed by the researcher to find out the participants' opinions about the application and research competencies. The opinion form includes sections such as ideas about the progress of the course, the processes that the participants liked or disliked, and the points that they felt were missing. The prepared questions were sent to two researchers who are experts in qualitative research and expert opinions were obtained. The necessary arrangements were made and finalised in parallel with the feedback from the experts. The interview form was administered after the course.

Data Analysis

The data obtained from the "Competence in Research Scale" were analysed with the SPSS package programme. After the data were entered into the program, normality values were examined first. For this, Skewness and Kurtosis values were calculated. In this regard, Çokluk, Şekercioğlu, and Büyüköztürk (2010) state that one of the methods used to ensure univariate normality is the kurtosis and skewness coefficient. Skewness provides information about the symmetry of the distribution, while kurtosis provides information about the sharpness of the distribution (Balcı & Ahi, 2016: 69). Tabachnick and Fidell (2013) highlighted that if the skewness and kurtosis values are between ±1.50, the distribution is normal. The skewness and kurtosis values in the study are given in Table 2.

Table 2

Data on Normality Values

Variable	Skewness	Kurtosis
Problem definition	-.149	.341
Literature review	-.092	-.113
Method	-.031	.703
Findings and interpretation	.070	-.170
Reporting	-.493	.683
Total	-.602	.626

As can be seen in Table 2, the data were normally distributed and the dependent group *t*-test was used to compare the pre-test and post-test scores. In addition, the data obtained from the participants' opinions were subjected to descriptive analysis. At this stage, the answers given by the students to the questions in the opinion form were read and those related to research competencies were coded. The most recurrent of these answers were explained in the findings section and presented with the support of the students' expressions. The students' opinions are written in Turkish and translated into English for the article.

Findings

The results of the dependent t-test for the significance of the difference between the pre-test and post-test scores of the student's research competencies scale are presented in Table 3.

Table 3

T-test Results for Students' Research Competencies Pre-Test and Post-Test Scores

Variable	Maks. Score	Measurement	N	X	S	sd	t	p
Problem definition	40	Pre-test	33	25.36	5.43	32	-10.750	.000
		Post-test	33	35.15	3.47			
Literature review	45	Pre-test	33	29.12	6.28	32	-10.749	.000
		Post-test	33	41.12	3.72			
Method	50	Pre-test	33	28.88	6.66	32	-11.246	.000
		Post-test	33	41.42	5.49			
Findings and interpretation	35	Pre-test	33	23.79	4.99	32	-8.354	.000
		Post-test	33	30.76	3.30			
Reporting	45	Pre-test	33	29.21	8.28	32	-10.168	.000
		Post-test	33	39.97	4.32			
Total	215	Pre-test	33	136.36	26.65	32	-12.703	.000
		Post-test	33	188.42	17.85			

It was found that there was an increase in the research competencies scores of the students participating in the study after the experimental application ($t(32)=-12.703$, $p<.05$). While the mean research competencies score of the students was 136.36 before the application, it increased to 188.42 after the application. In this context, it can be said that the experimental application caused an increase in the student's research competencies.

In problem definition, which is one of the sub-dimensions of research competencies, the mean pre-test score of the participants was 25.36, while the post-test score was 35.15. It was understood that there was a significant difference in favour of the post-test in the dimension of problem definition after the experimental application ($t(32)=-10.750$, $p<.05$). In the literature review sub-dimension, it was found that there was an increase in the level of literature review competencies of the masters students after the experimental application ($t(32)=-10.749$, $p<.05$). Whereas the mean of the students' literature review competencies scores was 29.12 before the application, it increased to 41.12 after the application. In the method sub-dimension of the study, it was found that there was an increase in students' method competencies scores after the experimental application ($t(32)=-11.246$, $p<.05$). Whereas the mean method competencies score of the master students was 28.88 before the application, it increased to 41.42 after the application. In findings and interpretation, which is another sub-dimension of research competencies, the mean pre-test scores of the participants were 23.79, while the post-test scores were 30.76. It was understood that there was a significant difference in favor of the post-test in the findings and interpretation sub-dimension after experimental application ($t(32)=-8.354$, $p<.05$). In the reporting sub-dimension of research competencies, it was found that there was an increase in the reporting competence levels of the masters students after the experimental application ($t(32)=-10.168$, $p<.05$). Whereas the mean reporting competence score of the master students was 29.21 before the application, it increased to 39.97 after the application. In this context, it was understood that the "Journey to Literature Survey and Review" project was effective in developing Master's degree students' research competencies and all sub-competencies.

Looking at the scores of the students in the study, while the maximum score is 40 points in the sub-dimension of problem definition, the students scored 35.15 points in the post-test. While the maximum score was 45 points in the literature review sub-dimension, the students scored 41.12 points

in the post-test, and while the maximum score was 50 points in the method sub-dimension, the students scored 41.42 points in the post-test. While the maximum score was 35 points in the findings and interpretation sub-dimension, the students scored 30.76 points in the post-test, and while the maximum score was 45 points in the reporting sub-dimension, the students scored 39.97 points in the post-test. If we look in general, we can see that in the study the students scored 188.42 points in the post-test, while the maximum score was 215 points in the research competence scale. As can be understood, it can be said that the research competence scores of the students in the post-test are high.

The data from the opinion form supports this observation. One of the students stated that the training contributed to the research process and that he liked it, explaining his reasons as follows: "*...the reason was that they enlightened me on issues that I did not know and had question marks in my mind*". Another student expressed the contribution of the process to research competencies as follows "*...We learned how to do the process from beginning to end. For example, I did not know how to edit the articles I downloaded, but I learned thanks to this course*". A similar opinion is expressed as follows *"...I learnt a lot about how to access resources"*. Similarly, there are many opinions about literature review, method, and writing. The more knowledge and experience students have about the process, the more their research competencies will improve. Some of the opinions about the contributions are as follows:

"*...Apart from the programs, the courses on literature review, what it is, how to do it, types of review, literature writing, citation, and types of analysis were among the courses that I benefited a lot from*."

"*...This course has taught me many useful databases that I do not use and should* use."

"*...Although I have taken 3 courses similar to scientific research methods and measurement and evaluation, 2 undergraduate + master, I realised that I still have deficiencies...*"

"*...I can also state that it has made a great contribution not only to the readiness of the courses, but also for someone like me who is in the master period and the ongoing process, it has made a great contribution to what I will pay attention to both in the thesis period and my article studies, and how I will create a theoretical and conceptual framework...*"

Students stated that the training contributed to this degree because it was case study and practice-oriented. One student's opinion on this was as follows *"...conducting the course through examples and presenting it with a holistic approach made it easier for me to learn"*. In addition, another finding that shows the contribution of the course to students' research competencies is that students want to apply the information they have learned and want to research the subject. As one student put it. "*...it encouraged me a lot about meta-thematic analysis and I will talk to my supervisor as soon as possible and ask if I can do a study in this area. It was very good for me to get such information from him"*. In addition, students stated that similar training should be organized and one student stated that "*...considering that master students are beginners in this way, it will be useful in terms of conducting and producing better studies...*". In addition, students made suggestions about the programme to make the process more effective. One of the most recurring suggestions is the need for face-to-face teaching. As one student put it: "*…because I think it would be more useful face to face because the application is done...*"

Discussion, Conclusion and Implications

As a result of the study, it was concluded that the "Journey to Literature Survey and Review" project provided a significant increase in the level of research competencies of the postgraduate students. It was also found that there was a significant increase between the students' pre-test and post-test scores ($t(32)=-12.703$, $p<.05$). Furthermore, it was found that the application provided a significant increase in each sub-dimension of research competencies [problem definition ($t(32)=-10.750$, $p<.05$), literature review ($t(32)=-10.749$, $p<.05$), method ($t(32)=-11.246$, $p<.05$), findings and interpretation ($t(32)=-8.354$, $p<.05$), and reporting $t(32)=-10.168$, $p<.05$)]. Looking at the mean scores of the sub-dimensions, it can be seen that there is a significant increase, especially in the dimensions of literature review and method. The opinions of the students also support this situation and many positive opinions were identified, especially about the literature review, method and writing aspects. If we look at the sub-dimensions of research competencies, this is in line with the content of the

training we provide. In particular, literature reviews and methods (types of review) were emphasised in detail in the training. In addition, as problem identification and findings were explained for each type of review, and the process of writing the literature review was covered, it was desired and expected that students would develop research competencies in these areas as well. When reviewing the literature, it is noted that there are studies investigating the impact of different practices/training on participants' research competencies and it is generally noted that research competencies have improved. Julien, Lexis, Schuijers, Samiric and McDonald (2012) found that their revised curriculum successfully supported the development of research skills and graduate competencies. Jacobsen, McDermott, Brown, Eaton, and Simmons (2018) found that an online inquiry-based education Master's degree programme conducted for graduate students was effective in improving their research skills. Xu, Zhou, Kogut, and Clough (2022) found that graduate students who received research data management (RDM) training scored significantly higher on RDM knowledge than students in the control group. There are various studies in the literature that show that research training is effective in developing research competencies. In his study, Büyüköztürk (1996) found that the research methods course had a greater effect on the research competencies of the participants. In his study, Büyüköztürk (1999) found that teachers who took research and measurement and evaluation courses in their pre-service education were more competent in the field of research than those who did not take these courses. In this context, research courses have an important contribution to the development of students' research competencies, especially where student-activated methods are used. This is one of the main reasons why the programme in our study was so effective in developing students' research competencies. The practical nature of the training in our programme is an important aspect of it as revealed by students' opinions. In this context, it can be said that research training should be increased in parallel with the education provided. Similarly, Ismail and Meerah (2012) state in their study that there is still room for improvement in developing students' research skills, perhaps by attending specialised training workshops on conducting research and especially on research methodology.

In the study, students often indicated that they had acquired knowledge about literature review and synthesis and that this had a positive effect on their competencies related to the research process. As noted by Wester and Borders (2014), several recurring themes stand out among the research competencies areas, one of which is research knowledge and skills. In this context, it is assumed that the more knowledge students have about reviewing and synthesising literature, the more their research competencies will improve. One of the important points here is experience. In other words, to the extent that the learned knowledge is applied and experienced, students' research competencies will be positively affected. Saracaloğlu (2008) found in his study that there was a statistically significant difference in the research competencies scores of graduate students according to their educational status, and this difference was in favor of doctoral students. She also stated that this may be because they have been more involved in research processes and their research experience has increased. This finding is in line with our study. Similarly, Bieschke, Bishop, and Garcia (1996) found that the number of years spent in graduate education and participation in research activities were significant in predicting research self-efficacy. In this context, the more knowledge and experience students have about the research process, the more they will want to do research, and the more they will experience positive developments in their research competencies.

Another finding of our study is that students wanted to apply the information they had learned about the literature review and they wanted to research this topic more. This also indicates the contribution to students' research competencies. As stated by Lambie, Hayes, Griffith, Limberg, and Mullen (2014), students who participated in research activities, including the publication of an article, scored higher in research self-efficacy than those who did not participate in the publication process. A study determined that the variables that influence research competencies are attitude toward research, research experience, and academic motivation (Saracaloğlu, 2008). At this point, the individual's participation in the research process contributes significantly to the development of his/her research competencies. The converse is also true, i.e. individuals with high research competencies want to

participate more in the research process. Faghihi, Rakow, and Ethington (1999) found that students' research self-efficacy contributed significantly to the progress of their dissertation. In this context, there is indeed a reciprocal relationship between research competencies and doing research. In their study, Pasupathy and Siwatu (2014) found a significant but small relationship between research self-efficacy and productivity. In this context, it is recommended that graduate students, together with their supervisors, should participate in the publication process to be able to conduct academic studies and be successful in their dissertations, i.e. to improve their research processes and competencies.

The study found that students scored 188.42 points on the research competencies scale in the post-test. In this context, it can be said that the research competencies of the master students are high. In addition, although the students scored highly in all sub-dimensions, this was especially in the literature review sub-dimension. In general, the studies in the literature also support this situation. In the studies conducted, it has been concluded that the research competencies level of graduate students is "quite sufficient" (Saracaloğlu, 2008), the scores of graduate students from the research self-efficacy scale are at the level of 3.10 out of 5 (Özkara, 2018) and students are reasonably successful in research skills (Ismail & Meerah, 2012). Meerah et al. (2012) found that, in general, graduates had moderate knowledge and competencies in conducting research. Büyüköztürk (1999) found that teachers consider research competencies important, but they do not have these competencies adequately. Akgün and Güntaş (2018) stated in their study that according to the opinions of counsellors, although Ph.D. students are considered sufficient in many aspects, many competencies are not sufficient for master students. As Ph.D. students usually write a thesis at Master's level, they are expected to have more knowledge and experience. At this point, it is necessary to provide training to improve the research competencies of students, especially at the undergraduate and Master's degree levels.

As a result of the study, it was found that the research competencies of the students improved significantly because of the training. In this context, it is considered that the frequency of this and similar training should be increased. At this stage, Leshchenko et al. (2021) state in their study that the requirements of the digital society for the information and research skills of graduate and doctoral students have been defined. They include readiness and ability to carry out research activities; ability to search and select necessary information and data, their transformation, storage, and transmission using digital technologies; ability to critically evaluate found information (check their accuracy, timeliness, expediency); ability to perform scientific research (organisation, planning, conducting) with use of digital technologies. At this point, it may be recommended to provide training that takes these variables into account. In addition, the data from this training process showed that even in the literature survey and review carried out by all students, many missing points were identified. In this respect, providing similar training on each of the research methods will have a great impact on both the quality of the studies and the development of the students' competencies/skills. In addition, as our study coincided with the pandemic process, the training was carried out online. In parallel with this situation, the master's students suggested that face-to-face training would make the process more effective. It is believed that face-to-face training will contribute much more and it is recommended that the training should be conducted face-to-face. The study found that the more knowledge and experience students have, the more their research competencies develop. In this context, it is recommended to include compulsory or elective courses in the graduate education process.

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