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COMPARISON OF THE OPINIONS OF THE GRADUATE STUDENTS IN KAZAKHSTAN ABOUT THEIR SCIENTIFIC RESEARCH COMPETENCIES

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Abstract
The purpose of the current study is to compare the opinions of graduate students continuing their graduate studies in Kazakhstan about their scientific research competencies. As the present study aims to compare the graduate students' existing scientific research competencies, it was designed as a descriptive study in the survey model. Survey models are research approaches aiming to describe any state having existed in the past or still existing at present as it was or is.

The study group of the current research consists of graduate students randomly selected from among the students continuing their graduate studies in the fields of educational sciences and subject area education at the universities of Avrasya University, Abay University, Pavlodar State University and Ahmet Yesevi University in Kazakhstan.

In the current study, as the data collection tool, The Scientific Research Competency Scale developed by Lyazzat Beisenbayeva was used. The reliability and validity studies of the scale were conducted (α=0.958). The findings of the study revealed that no gender-based significant difference was found among the opinions stated about the sub-dimensions and the whole of the scale. Depending on the students' graduate education level, a significant difference was found in the opinions stated about the sub-dimensions of measuring tool and data analysis in favor of the master's students.

Keywords: Graduate Students, Kazakhstan, Scientific Research.

INTRODUCTION

The main purpose of science is, on the basis of observations and experiments, to elicit the relationships between phenomena, to generalize the confirmed relationships and to reach theories and laws from generalizations. This objective of science can be accomplished by using scientific method. Scientific method is a combination of induction and deduction, two important means of obtaining information. Scientific method constitutes the process aspect of science. Development of science throughout the history has occurred in a long process. Scientific studies initiated by Mesopotamian and Egyptian civilizations are continuing today at a speed impossible to follow. The most important ground of the developments experienced in the fields of science and technology is undoubtedly scientific research (Yenilmez, Ata, 2012).

There are many definitions of the concept of research. Research, in most of the time, is considered to be made up of only looking at events and collection of information, data and statistics. Of course, during the research process, it is an obligation to investigate cases and collect data. However, the researcher reorganizes his/her observations and collected data, analyzes and synthesizes them, interprets, evaluates and turns them into a coherent unity. This is a very complex activity (Kaptan,

1993: 12). On the basis of its lexical meaning, it is defined as methodological research conducted in relation to science and art. Research is defined as a process of planned and systematic collection, analysis, evaluation, interpretation and reporting of data to seek for reliable solutions (TDK, 2016).

The term of research is generally defined as careful and systematic inquiries and investigations conducted to elicit facts and principles in the domains of information. Research is the most important process that can be resorted to by people to make technological development possible, get to know their environment, make good use of it and to find solutions to problems. The research process should be viewed as a problem solving activity directed towards revealing new findings by using scientific methods approved by science authorities (Kaptan, 1993: 13).

Defining research as a science of methodology, Karasar (1984:10) views research as an important discipline of science. Research symbolizes a scope of science having content like physics, chemistry and history.

Scientific research is the sum of information production activities conducted in relation to determination of problems related to a specific issue, planning of solutions, their application and conclusion, discussion and interpretation of the results (Yenilmez, Ata, 2012). Scientific research is a process of finding reliable solutions to problems as a result of systematic, purposeful and planned collection, grouping, analysis, synthesis, explanation, interpretation and evaluation of data. According to another definition, it is an attempt to get to know man and the universe by producing testable information on the basis of observations and experiments. The main objective of scientific research is to find solutions to problems encountered by individuals and societies and to put some new tools and equipments into the service of humanity (Bayar, at all, 2013).

Scientific research, in general, is a comprehensive and meaningful term covering the processes of collecting, analysis of data to test a hypothesis and reporting of the findings in a systematic and rigorous manner (Boudah, 2011).

For the conduction of scientific research and evaluation of its results, researchers should acquire the competencies required by research techniques. Thus, it seems to be of great importance to impart these competencies to graduate students during their graduate education.

Research instruction can be defined as instruction aiming to inculcate information, skills and scientific attitudes and behaviors in researchers for them to conduct research or to draw on research that has already been conducted (Karasar, 1991).

According to Bökeoğlu and Yılmaz (2005), research instruction is an indispensable part of being a citizen meeting the requirements of our age because one of the most important characteristics of this instruction is its contributing to development of scientific perception, attitudes and behaviors in individuals. Moreover, individuals subjected to research instruction will have low concern of doing research and be willing to take part in research projects or different research activities and to develop their critical thinking.

One of the objectives set by universities for their doctorate programs is to prepare their students so that they can conduct their research on their own. The main goal of doctorate education is to impart skills to its students for them to conduct research on their own, to investigate and interpret scientific incidences from a broad viewpoint and to reach new syntheses. In this regard, there are some competencies to be possessed by students completing or having completed their doctorate studies. These competencies can be listed as being able to follow the scientific developments in their fields, interpret and analyze them and find the connections between them and conduct research on their own (Keskinkılıç and Ertürk, 2009).

Lack of statistical knowledge not only causes problems for a researcher in the stage of conducting research but also in the stages of understanding and making use of research that has already been conducted. When a research encounters such problems, he/she may have to seek for help. For a researcher to be educated well, he/she must read a lot of research and have a good knowledge of research methods and techniques. In this connection, it can be argued that the statistic courses should be required throughout both master's and doctorate education (Akbulut et al., 2013).

Doctorate education is the center of academic applications. The goal of this education is to train academicians, researchers and scientists who can plan, conduct, conclude and publish basic research necessary for economic and technological development. To this end, doctorate education should impart skills in their students for them to conduct research on their own, investigate and interpret scientific incidences from a broader viewpoint and to reach new syntheses (Keskinkılıç and Ertürk, 2009, Akbulut et al., 2013). The objective of research instruction is to train individuals with attitudes and behaviors of a researcher (Köklü et al., 1999).

It has been widely observed that during their graduate education, graduate students encounter different problems so that they gain a lot of experience about dealing with such problems and then they can direct their own research on the basis of their experiences in the future. In light of these findings, it can be argued that problems encountered during the doctorate studies contribute to the development of research skills. Furthermore, if students who will start their graduate education become cognizant of the problems experienced and suggestions made by the participants of the current study, then they will be aware of the possible problems to be encountered during the process and thus they can take some measures against these problems (Akbulut et al., 2013).

Purpose of the study

Lack of competencies related to research techniques is one of the main problems of graduate students. This problem can affect every stage of research process ranging from the construction of the research problem to writing of the research report. Due to their shortcomings in research techniques, many graduate students can continue their academic studies through professional aid or cannot complete their studies and quit their education. As the number of graduate programs is increasing, this problem is gradually becoming more serious (Nartgün, 2010., Saracaloğlu, 2008., Köklü et al., 1999). Thus, it has become an obligation for graduate students to acquire scientific research competencies to conduct their research and make use of the results of existing research.
In the present study, the purpose is to compare the opinions of graduate students continuing their studies in the fields of educational sciences and subject area education in Kazakhstan. To this end, answers to the following research questions were sought.

Sub-problems

1. Do the graduate students' opinions about their scientific research competencies vary significantly depending on their gender?
2. Do the graduate students' opinions about their scientific research competencies vary significantly depending on their grade level?
3. Do the graduate students' opinions about their scientific research competencies vary significantly depending on their state of having taken the courses of scientific research methods and techniques and measurement and evaluation?

METHOD

As the purpose of the current study is to compare the opinions of the graduate students continuing their studies in the fields of educational sciences and subject area education in Kazakhstan about their scientific research competencies, it was designed as a descriptive study employing survey model. Survey models are research approaches aiming to describe a state as it was or is.

Sampling

The sampling of the current study is comprised of 100 graduate students randomly selected from among the students continuing their graduate studies in the fields of educational sciences and subject area education at the universities of Avrasya University, Abay University, Pavlodar State University and Ahmet Yesevi University in Kazakhstan.

Data collection tool

As the data collection tool of the current study, The Scientific Research Competency Scale developed by Lyazzat Beisenbayeva was used. The reliability and validity studies of the scale were conducted (α=0.958). The scale consists of four dimensions and thirty two items. The scale was designed in the form of five-point Likert-type scale and score distribution of the scale is given in Table 1.

Table 1: Distribution of the score intervals of the Scientific Research Competency Scale

Options	Score	Score interval	Scale evaluation
I am completely incompetent	1	1.00 - 1.80	Perception of competency is very low
I am partially competent	2	1.81 - 2.60	Perception of competency is low
I am moderately competent	3	2.61 - 3.40	Perception of competency is medium
I am quite competent	4	3.41 - 4.20	Perception of competency is high
I am completely competent	5	4.21 - 5.00	Perception of competency is very high

Data analysis

The collected data of the study were analyzed in line with the purpose of the study. As the data of the study exhibited a normal distribution, t-test was used to determine whether there is a significant difference between the graduate students' opinions. The obtained findings were tabulated and then interpreted.

FINDINGS

In this section of the study, on the basis of the data collected with the Scientific Research Competency Scale, findings related to the graduate students' scientific research competencies are presented. In Table 2, the distribution of the graduate students by gender is given.

Table 2: Distribution of the graduate students by gender

Gender	f	%
Female	67	67
Male	33	33
Total	100	100

As can be seen in Table 2, of the participating students, 67% are females and 33% are males. Majority of the participants are females. In Table 3, the distribution of the grade levels of the participating students is given.

Table 3: Distribution of the grade levels of the participating students

Grade level	f	%
Master	69	69
Doctorate	31	31
Total	100	100

As can be seen in Table 3, 69% of the participating students are master's students and 31% are doctorate students. Majority of the students are master's students. In Table 4, the distribution of the students according to their state of having taken the courses of scientific research methods and techniques and measurement and evaluation is given.

Table 4: Distribution of the students according to their state of having taken the courses of scientific research methods and techniques and measurement and evaluation

Courses	**Yes**		**No**		**Total**	
	f	**%**	**f**	**%**	**f**	**%**
Measurement and evaluation	22	22	78	78	100	100
Scientific research techniques	74	74	26	26	100	100
Advanced research techniques	8	8	92	92	100	100
Statistics	14	14	86	86	100	100

As can be seen in Table 4, while 78% of the students have not taken the course of measurement and evaluation, 22% of them have taken it; while 74% of them have taken the course of scientific research methods and techniques, 26% of them have not; while 92% of them have not taken the course of advanced research techniques, 8% have; while 86% of them have taken the course of statistics, 26% have not. Thus, it can be said that majority of the graduate students continuing their graduate studies in the fields of educational sciences and subject area teaching in Kazakhstan have taken the course of scientific research methods and techniques; yet, they have not taken enough courses within the context of scientific research competencies. In Table 5, gender-based comparison of the graduate students' opinions about their scientific research competencies is presented.

Table 5: Gender-based comparison of the graduate students' opinions about their scientific research competencies

Dimensions	Gender	N	X	Sd	**df**	t	p
Problem statement	Female	67	18,88	3,36435	63,214	-,460	,647
	Male	33	19,21	3,39814			
Measuring tool	Female	67	25,80	5,11160	76,573	-,741	,461
	Male	33	26,51	4,16924			
Data analysis	Female	67	18,04	3,80364	69,902	1,861	,067
	Male	33	19,45	3,43776			
Reporting	Female	67	57,58	11,03870	76,881	-1,173	,245
	Male	33	60,00	8,96172			
Total	Female	67	120,31	20,08558	76,872	-1,297	,198
	Male	33	125,18	16,30846			

As can be seen in Table 5, the graduate students' opinions about their scientific research competencies do not vary significantly depending on the gender variable. The students' perception of their scientific research competencies was found to be high in general (Female X=120.31, Male X=125.18). In a study conducted by Konokman, Tanrıseven and Karasolak (2013) on the fourth-year pre-service teachers having taken the course of scientific research methods, it was reported that the pre-service teachers have positive attitudes towards educational research. The authors also concluded that gender, the department attended, achievement levels in the courses of measurement and evaluation and scientific research techniques and scientific research experience did not lead to significant differences in the pre-service teachers' attitude scores. In Table 6, a grade level-based comparison of the graduate students' opinions about their scientific research competencies is presented.

Table 6: Grade level-based comparison of the graduate students' opinions about their scientific research competencies

Dimensions	Grade level	N	X	Ss	Sd	t	p
Problem statement	Master	69	19,15	3,41546	60,357	,763	,448
	Doctorate	31	18,61	3,26269			
Measuring tool	Master	69	26,71	4,96784	68,720	2,266	,027
	Doctorate	31	24,54	4,13794			
Data analysis	Master	69	19,04	3,61547	55,811	2,141	,037
	Doctorate	31	17,32	3,76286			
Reporting	Master	69	58,36	11,18819	73,910	-,028	,978
	Doctorate	31	58,41	8,62081			
Total	Master	69	123,27	20,76471	82,595	1,230	,222
	Doctorate	31	118,90	14,06261			

As can be seen in Table 6, the graduate students' opinions about their scientific research competencies do not vary significantly depending on the grade level variable when the total score of the scale is considered. However, when grade level-based comparison was performed for the sub-dimensions, significant differences were found for the sub-dimensions of developing a measuring tool and data analysis. In terms of the sub-dimension of developing a measuring tool, the mean score was found to be X=26.71 for the master's students and X=24.54 for the doctorate students. Thus, for this dimension a significant difference was found in favor of the master's students (t=2.266, p <.05). Again, in terms of the sub-dimension of data analysis, a significant difference was found as a result of t-test in favor of the master's students. In this dimension, the mean score of the master's students is X=19.04 and that of the doctorate students is X=17.32. In terms of the sub-dimension of data analysis, a significant difference in favor of the master's students was found (t=2.141, p <.05). In Table 7, a comparison of the graduate students' opinions about their scientific research competencies in terms of the state of having taken the course of scientific research methods and techniques is presented.

Table 7: Comparison of the graduate students' opinions about their scientific research competencies in terms of the state of having taken the course of scientific research methods and techniques

Dimensions	The state of having taken the course of scientific research methods and techniques	N	X	Ss	Sd	t	p
Problem statement	No	26	19,07	3,80445	38,336	,141	,889
	Yes	74	18,95	3,21997			
Measuring tool	No	26	25,57	5,92063	35,150	-,493	,625
	Yes	74	26,20	4,39171			
Data analysis	No	26	18,38	4,15766	38,952	-,185	,854
	Yes	74	18,55	3,59658			
Reporting	No	26	58,65	11,85898	38,090	,142	,887
	Yes	74	58,28	9,94715			
Total	No	26	121,69	21,37058	38,544	-,066	,948
	Yes	74	122,00	18,22312			

As can be seen in Table 7, the graduate students' opinions about their scientific research competencies do not vary significantly depending on their state of having taken the course of scientific research methods and techniques in terms of the total score taken from the whole scale. In

terms of the sub-dimensions of the scale, again no significant difference was found between the graduate students' opinions about their scientific research competencies. In Table 8, a comparison of the graduate students' opinions about their scientific research competencies in terms of the state of having taken the course of measurement and evaluation is presented.

Table 8: Comparison of the graduate students' opinions about their scientific research competencies in terms of their state of having taken the course of measurement and evaluation

Dimensions	**State of having taken the course of measurement and evaluation**	**N**	**X**	**Ss**	**Sd**	**t**	**p**
Problem statement	No	78	18,87	3,41258	35,472	-,683	,499
	Yes	22	19,40	3,21691			
Measuring tool	No	78	25,70	4,90721	37,443	-1,407	,168
	Yes	22	27,22	4,35269			
Data analysis	No	78	18,29	3,69313	32,750	-1,063	,296
	Yes	22	19,27	3,84438			
Reporting	No	78	58,14	10,87440	41,048	-,485	630
	Yes	22	59,22	8,77188			
Total	No	78	121,08	19,15521	34,897	-,920	,364
	Yes	22	125,13	18,40884			

As can be seen in Table 8, the graduate students' opinions about their scientific research competencies do not vary significantly depending on the state of having taken the course of measurement and evaluation in terms of the total score taken from the whole scale. In terms of the sub-dimensions of the scale, again no significant difference was found between the graduate students' opinions about their scientific research competencies. In Table 9, a comparison of the graduate students' opinions about their scientific research competencies in terms of the state of having taken the course of advanced research techniques is presented.

Table 9: Comparison of the graduate students' opinions about their scientific research competencies in terms of their state of having taken the course of advanced research techniques

Dimensions	**State of having taken the course of advanced research techniques**	**N**	**X**	**Ss**	**Sd**	**t**	**p**
Problem statement	No	92	18,85	3,42769	10,688	-2,015	,070
	Yes	8	20,50	2,07020			
Measuring tool	No	92	25,83	4,89511	10,520	-2,144	,056
	Yes	8	28,37	3,02076			
Data analysis	No	92	18,46	3,62667	7,643	-,292	,778
	Yes	8	19,00	5,04268			
Reporting	No	92	58,10	10,35253	8,044	-,815	,438
	Yes	8	61,50	11,36410			
Total	No	92	121,27	18,97546	8,325	-1,182	,270
	Yes	8	129,37	18,56215			

As can be seen in Table 9, the graduate students' opinions about their scientific research competencies do not vary significantly depending on the state of having taken the course of advanced research techniques in terms of the total score taken from the whole scale. In terms of the

sub-dimensions of the scale, again no significant difference was found between the graduate students' opinions about their scientific research competencies.

Table 10: Comparison of the graduate students' opinions about their scientific research competencies in terms of the state of having taken the course of statistics

Dimensions	State of having taken the course of statistics	N	X	Sd	df	t	p
Problem statement	No	86	18,88	3,49931	23,703	-1,039	,309
	Yes	14	19,64	2,34052			
Measuring tool	No	86	25,72	4,99329	27,495	-2,410	,023
	Yes	14	28,00	2,90887			
Data analysis	No	86	18,44	3,71200	16,951	-,431	,672
	Yes	14	18,92	3,95094			
Reporting	No	86	58,00	10,88118	25,705	-1,264	,218
	Yes	14	60,71	6,73028			
Total	No	86	121,04	19,69408	23,865	-1,525	,140
	Yes	14	127,28	13,08216			

As can be seen in Table 10, the graduate students' opinions about their scientific research competencies do not vary significantly depending on the state of having taken the course of statistics in terms of the total score taken from the whole scale. In terms of the sub-dimensions of the scale, a significant difference was found for the sub-dimension of developing a measuring tool in favor of those having taken the course of statistics ($t=2.410$, $p <.05$).

RESULTS

The findings of the current study revealed that;

1. The participating students of the current study think that their scientific research competencies are quite adequate.
2. On the basis of the gender of the students, no significant difference was found among the students' opinions about their scientific research competencies.
3. A significant difference was found in favor of the master's students in terms of the sub-dimensions of developing measuring tools and data analysis. The master's students think that they are more competent in terms of conducting research than the doctorate students.
4. Depending on the state of having taken courses related to scientific research, no significant differences were found between the graduate students' opinions about their scientific research competencies. On the other hand, a significant difference in favor of the master's students was found for the sub-dimension of developing a measuring tool depending on the state of having taken the course of statistics.

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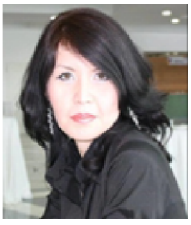

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