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Examination of Scientific Research Motivation and Methodological Paradigms of ICT Oriented Young Education Researchers

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Abstract

Methodological paradigms and scientific research motivations of ICT oriented young education researchers was examined in this study. "Scientific Research Motivations and Methodological Paradigms Survey" was used as the data collection tool. 101 young scholars from 8 university completed the survey in 2014-2015 academic year. For the analysis of the collected data, the descriptive statistics of %, *f*, Sd, N and $\bar{X}$ and the parametric tests of independent-samples t-test, one-way ANOVA, Pearson correlation coefficient and path analysis were used. It was determined that young education researchers are intrinsic motivated primarily contribute to human life and scientific curiosity and support quantitative paradigm for their scientific research. It was also revealed that the young education researchers who considered themselves to have a *moderate level* of technology use had more *financial* motivation than those who considered themselves to have an *advanced* level of technology use. It was found that the assistant professors aged 30-39 preferred *quantitative paradigm* more than 20-29 aged research assistants. The results of path analysis demonstrated that among scientific research motivations *scientific contribution* significantly predicted *quantitative* (β=.529, p=.001<.05) and *mixed* paradigms (β=.425, p=.028<.05).

Keywords

Young education researchers
ICT in education
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Introduction

Scientific research is undoubtedly in a rapid and comprehensive transformation, and the source of this transformation includes new technologies. Information Communication Technology (ICT), including academic journals, databases, electronic libraries, search engines, social networks and several other related tools, has now become an indispensable part of science and scientific research. In time, these technologies have become environments where scientific studies are conducted and shared. In other words, developments in ICTs have increased the ways of conducting scientific studies. Especially for social sciences, these new environments have started to form unique research settings. According to Birnbaum (2014) HTTP, which allows delivering information through WWW, has created a new and exciting way for conducting research via the Internet not only in social sciences as well as in all other fields (Birnbaum, 2004).

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By Internet technologies, it is now possible for scholars to gather data at any time and in any place. All kinds of data collection tools such as questionnaires, tests, scales and evaluation forms developed in the electronic environment can be made accessible in quite a short time via the Web for the target population. The data collected with these tools delivered instantly to all participants via the Web are recorded automatically without a need for any special equipment or paper and without any effort or cost of posting.

The number of studies conducted using the electronic environment and the related tools is increasing day by day. Individuals have the opportunity to express their views more freely and clearly in online environment than they do in any other environment, and their views are accessible in any place. According to Stanton and Rogelberg (2001), this new environment, which allows individuals to express their views freely and clearly, has brought scientific research into a new dimension. Nentwich (2003) states that wide-spread use of ICTs in scientific studies has influence on how the academic world is organized, how it functions and what it produces.

ICT use in scientific studies and research communication did not always reveal positive results. According to Smart (2014), although there occur dynamic and innovative opportunities in research communication in different fields with ICT support, it also brings about tensions, abuses and non-ethical behavior.

The Internet has become the main tool for research communication today. However, despite this radical change, not only authors' motivation for publishing their studies in scientific research journals but also the importance they give to peer-reviewed publications has mostly remained the same (Ware & Mabe, 2012). Similarly, today, scientific research activities are not at the desired level in social media tools and related environments which are quite common with its increasing number of users. In addition, it is thought that such platforms as Linked, ResearchGate, Akademia and Mendeley designed directly for scientific research and for scholars will contribute to the spread of research communication.

In scientific studies, it now an important and effective tool for trainers, educators and scholars to make use of the electronic environment and related tools (Topp & Pawloski, 2002). The changing scientific research environments and opportunities are thought to change not only the methodological paradigms of young scholars conducting scientific research in different fields but also their scientific research motivations.

Scientific Research Motivations and Paradigms

This part summarizes the scientific research motivation and the methodological paradigms in scientific studies, which both constitute the two dependent variables of the present study. These two variables are presented below in line with the related literature.

Scientific Research Motivations

In order to better understand scientific research motivations, it is necessary to examine the Self-Determination Theory (SDT) (Deci & Ryan, 2011). According to this theory, for scientific research, there are two basic motivations: intrinsic motivation and extrinsic motivation. In this study, while determining the scientific research motivations, these two types of motivation were taken into account.

On the basis of SDT, Deemer, Martens, and Buboltz (2010) developed and tested a three-dimensional research motivation model to better understand why individuals tend to conduct scientific research. In the study carried out with 437 students from the fields of biology, chemistry, physics and psychology, Principal Component Analysis and factor analysis were conducted on 20 items related to scientific research motivations. Among the three factors obtained, intrinsic motivation explained 32,19% of the total variance; failure avoidance explained 15,84% of the total variance; and extrinsic motivation explained 7,49% of the total variance. In other words, the three factors determined explained approximately 55% of the variable of scientific research motivation.

One study carried out by Jing (2011), investigated the structural analysis of scientific research motivations in vocational high schools. The results of the exploratory and confirmatory factor analyses conducted revealed that the structural dimensions of scientific research motivation were gathered under four factors: individual motivation, social motivation, result-oriented motivation and process motivation.

Scientific research motivations are important both for the quality and effectivness of research and productivity of researchers especially in social science. (Tien & Blackburn, 1996). Growing usage of ICTs in scientific reserachs and changing research paradigm effected the research motivations of young researchers. In this context, investigation of scientific research motivation and methodological paradigms of young educational researchers have an imporance to understand the changing landscape of educational researchs.

Scientific Research Methodology

Although there is no common definition for paradigm, Kuhn (2012) defines paradigm as "the practices that define a scientific discipline at certain point in time". In methodological sense, paradigm includes the strategies, activities and criteria to be used to explain the research problem.

For the past century, especially in social sciences, there were methodological paradigm wars competing with quantitative and qualitative approaches. Quantitative paradigm suggests quantitative methods like experiments, while qualitative paradigm suggests such methods as interviews and participatory observation based on traditions like phenomenology and ethnography (Newman, 1998). In addition, quantitative and qualitative paradigms should not be considered to be opposite poles. Creswell (2013) points out that qualitative and quantitative approaches represent the two ends of a sustainability line of qualitative and quantitative approaches and that the mixed method is in the middle of this sustainability line.

In their study Easterday, Papademas, Schorr, and Valentine (1977) underline that female researchers focus on working in areas susceptible to qualitative paradigm. In addition, it have been determined that while female researchers prefer traditional methods of interview and observation in field studies, male researchers prefer photography, film, video and sound recording as data collection techniques.

In the last quarter of the 20th century, qualitative and quantitative research methods maintained the paradigm wars, and a third paradigm appeared which included the use of quantitative and qualitative methods in a single research project as a pragmatic approach. Johnson and Onwuegbuzie (2004) define the mixed method research as "the class of research where the scholar mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study" (p. 17). According to Fırat, Kabakçı Yurdakul, and Ersoy (2014), mixed method studies are not regarded as a simple combination of qualitative and quantitative methods but as comprehensive integration studies which involves the use of the strong sides of these methods.

In literature, there is not enough research showing how ICTs and changing methodological paradigms influence scientific research, productivity and scholars (Ding, Levin, Stephan, & Winkler, 2009; Smart, 2014). However, the changing paradigm effects the scientist's world view (Ünder, 2010). Because, observations significantly affected by the paradigm of the day and no one of observation exactly reflects the world. Review of the related literature revealed that there is no research examining both the scientific research motivations of young scholars using ICTs and the scientific research methodological paradigms. In this respect, the present study is thought to contribute to the related literature.

Purpose

The purpose of the present study was to examine the methodological paradigms of young scholars - who used ICTs in their scientific studies – with respect to their scientific research motivations. In this respect, the research questions directed in the study were as follows:

1. How do scholars' scientific research motivations differs depending on
    a. their gender,
    b. their ages,
    c. their titles and
    d. their technology competencies

2. How do scholars' scientific research paradigms differs depending on
    a. their gender,
    b. their ages,
    c. their titles and
    d. their technology competencies
3. Is there a significant relationship between scholars' scientific research paradigms and their scientific research motivations?

Method

This study was designed as general survey model. In the study, among the general survey models, the relational and single survey models were used. In the study, as the dependent variables, the relationship between the scholars' motivations and their research paradigms was examined. In this respect, the study was also a correlation study. Correlational studies aim at determining the relationship between dependent and independent variables using relational statistics (Johnson, 2001). In addition, in order to reveal the relationship between scholars' scientific research motivations and their scientific research paradigms, Path Analysis was conducted. Path Analysis, developed by Wright, aims at explaining the relationships between observed variables (Wright, 1921, 1934).

Participants

101 young scholars from Anadolu University, Çanakkale 18 Mart University, Nevsehir University, Balikesir University, Yüzüncü Yıl University, Trakya University, Mehmet Akif Ersoy University and Muş Alparslan University participated to the research in the 2014-2015 academic year. In determination of universities, 2014-2015 university ranking results of University Ranking by Academic Performance (URAP) Research Laboratory, Middle East Technical University Graduate School of Informatics considered (URAP, 2015). Thus, academic publication scores of the universities derived from article and citation scores of 127 universities in Turkey.

According to the ranking of academic publications, 75 scholars from the first 63 universities, 26 scholars from the last 64 universities participated in the study. While determining the participants, purposeful sampling method was used. For this purpose, the education researchers who were younger than 40 and who used ICTs in their studies or published their ICT-related studies were listed using the academic webpage of the universities. According to Levinson (1986), 20-40 age range is young adulthood including independent movement, Lifelong decisions, individual differences, rich experiences. This age range regarded as a periods of scientific research methodology and motivation formed period for academicians. Thus, under 40 age academics selected for this research.

Data collection tool delivered to 180 education researchers in the list and returned by 101 of the education researchers. 68 of 79 researchers did not answer any question. 11 of 79 researchers had responses with large blocks of missing data. Survey responses with large blocks of missing data were deleted.

Table 1. Demographic Backgrounds of the Participants

Demographic Backgrounds	Frequency (*f*)	Percentage (%)
Gender		
Female	27	26,7
Male	74	73,3
Age		
20-29	39	38,6
30-39	62	61,4
Title		
Research Assistant	62	61,4
Instructor	10	9,9
Assistant Professor	29	28,7
Technology Competencies		
Average	28	27,7
Advanced	73	72,3

Most of the education researchers participating in the study were male (%71%), aged between 30-39 (%61.4), with advanced technology use level (72.3%).

Data Collection Tool

In the study, as the data collection tool, the "Scientific Research Motivations and Methodological Paradigms Survey" developed within the scope of the study was used. The first draft of the questionnaire was formed based on the data obtained via the review of the related literature. In this context, an item pool was created on scientific research motivations of researchers. This item pool achieved 14 items. In addition, 6 questions of demographic characteristics and 3 items of methodological paradigms were determined. The questionnaire form was presented to six field experts for its face validity and content validity. In line with the experts' views, the questionnaire form was finalized. The irrelevant items were removed, and those close to one another were combined. Also, new items were included where necessary. As a result of the expert assessment, 3 items of methodological paradigms, 6 items of scientific research motivations and 4 questions of demographic characteristics were determined. The finalized questionnaire form was piloted with eight scholars. As a result of the pilot application, it was seen that it took approximately five minutes for the scholars to fill out the questionnaire form. Following the pilot application, the questionnaire form was finalized for the application in the study. Interface of online survey given below in Figure 1.

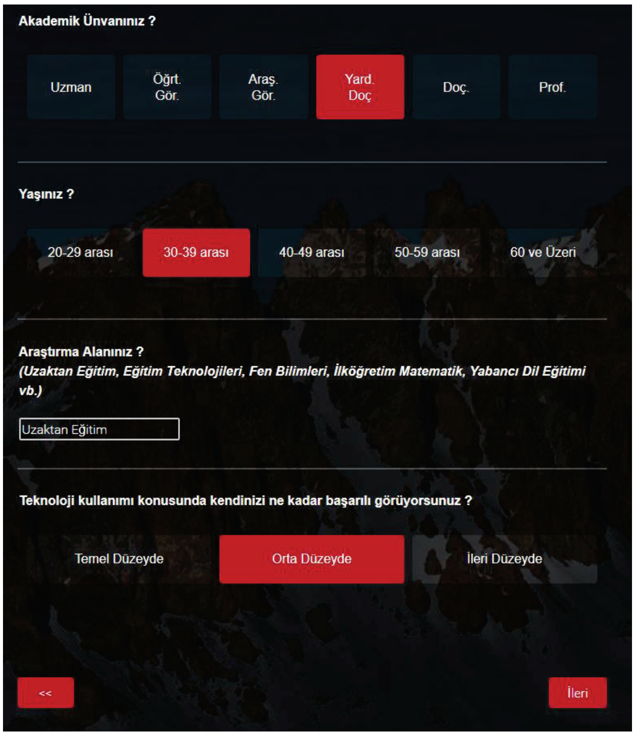


Figure 1. Survey Interface

In the first part of the questionnaire made up of three sections, there were four questions to obtain personal information about the participants. The second part focused on the scholars' scientific research motivations (career, scientific curiosity, money, scientific contribution, respect and contribution to human life). As for the last part, it investigated the scholars' scientific research paradigms (qualitative, quantitative and mixed). The second and third parts of the questionnaire included 5-point Likert-type items. These 5-point Likert-type items were scored as 'I absolutely disagree' (1), 'I disagree' (2), 'I'm neutral' (3), 'I agree' (4) and 'I absolutely agree' (5).

Data Collection Process

At the beginning of the data collection process, the "Scientific Research Motivations and Methodological Paradigms Survey" was transferred into the electronic environment. The items were transformed into online questionnaire items (radio buttons, drop-down, Likert). The six steps taken in the data collection process can be seen in Figure 2 below.

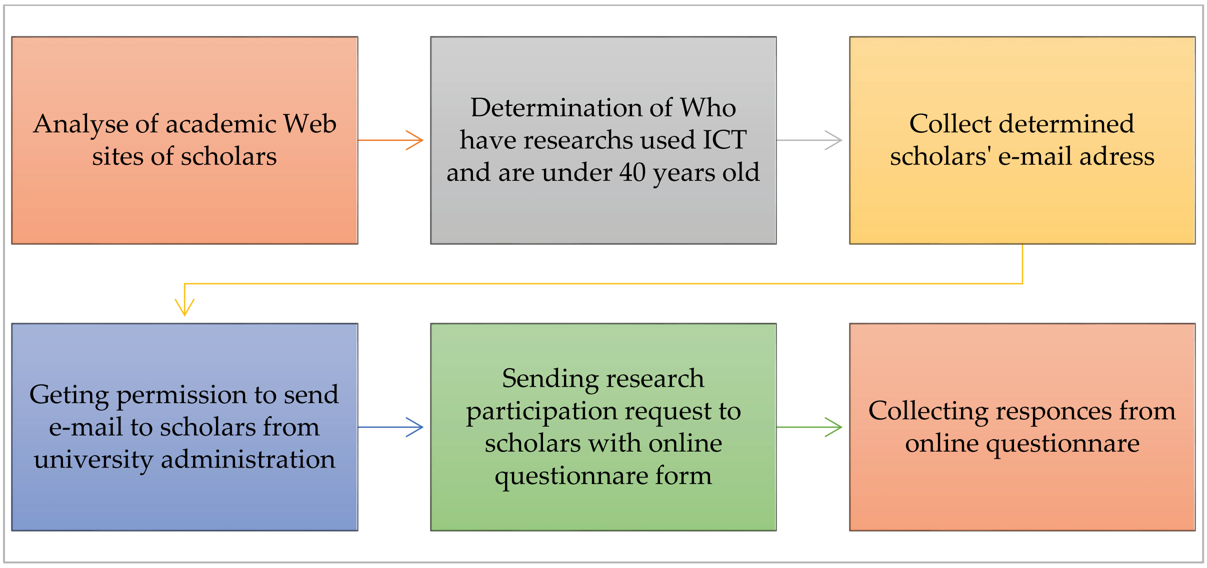


Figure 2. Data Collection Process

As can be seen in Figure 2, in the data collection process, first, the participants were determined with the purposeful sampling method. The participants determined were sent an e-mail both to request them to take part in the study on voluntary basis and to provide them with the link to the online questionnaire. The e-mail was sent only to the corporate e-mail accounts of the participating scholars.

Data Analysis

In the study, quantitative data were collected. For the analysis of the quantitative data gathered, the descriptive statistics of percentages, frequencies, standard deviations, number of participants and mean scores were used, and the parametric tests of independent samples t-test, one-way ANOVA and Pearson Correlation Coefficients were used. Correlation coefficient is regarded as the one that shows the direction and strength of the relationship between the independent samples. This coefficient ranges between (-1) and (+1). As correlation coefficients are not adequate to reveal the casual relationship between variables, path analysis was run. Path analysis was developed to explain the relationships between observed variables (Wright, 1934). Path analysis allows discriminating between direct and indirect relationships between dependent and independent variables and controlling the error variable (Brannick, 2014). SPSS Amos 22, SPSS Modeler 14.2 and SPSS Statistics 22 programs used for data analysis.

Since the distribution of the participants demonstrated great differences with respect to their titles, no comparison was made considering the participants' titles. The reason is that in parametric tests, the number of samples for each sub-group is expected to be at least 15. As a general rule, there should be at least 30 participants in correlation studies and at least 15 participants in each group in experimental studies (Balcı, 2004).

In the study, in order to explain scholars' six different research motivations with fewer variables and to conduct the analyses with respect to these variables, Principle Components Analysis, a factor analysis technique, was used. Principal Component Analysis is a method used to better explain the variance of original variables with fewer new variables (Jolliffe, 1986). In literature, it is reported that for the purpose of determining the components, values ranging between 0,30 and 0,45 can be used as the under-cut point for the factor loads of the items (Büyüköztürk, 2007). In this study, the factor load value of 0.40 was taken as the under-cut point. Table 2 below presents the rotated principle components matrix obtained as a result of Principle Components Analysis.

Table 2. Principle Components Analysis

Items	Factors	
	1	2
Contribution to Science	.856	-.162
Contribution to Human Life	.857	-.104
Scientific Curiosity	.845	-.159
Prestige	.774	.100
Career	.668	.128
Money	.211	.944

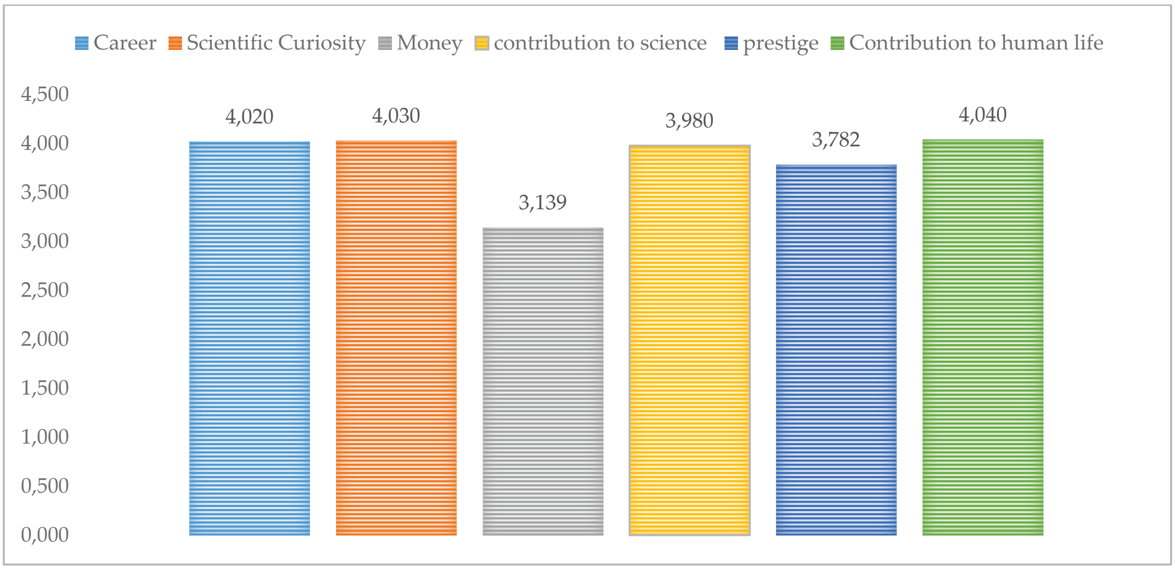
As can be seen in Table 2, the questionnaire items developed in line with the related literature were gathered under two components. Accordingly, the intrinsic motivation elements – scientific contribution, contribution to human life, scientific curiosity, respect and career – were gathered under one component, and extrinsic motivation element – money – was gathered under one component alone. The factor loads of the items gathered under the first component ranged between .668 and .857, the factor load of the item found under the second component was .944. These two components that can be defined as intrinsic motivation and extrinsic motivation explained approximately 70.87% of the variable of scientific research motivation. This could be regarded as an indicator of the fact that the questionnaire efficiently measured the scientific research motivations of the scholars. Deemer et al. (2010), in their study, explained approximately 55% of scientific research motivation with the factors of intrinsic motivation, failure avoidance and extrinsic motivation.

Results

The findings obtained in the present study, which examined young scholars' scientific research motivations and their research paradigms, are presented under three headings in line with the research questions.

Young Scholars' Scientific Research Motivations

The second part of the "Scientific Research Motivations and Methodological Paradigms Survey" developed within the scope of this study aimed at determining the scholars' scientific research motivations with the help of six 5-point Likert-type items. Graph 1 below demonstrates the scholars' mean scores regarding the motivation elements.



Graph 1. Young Scholars' Scientific Research Motivations

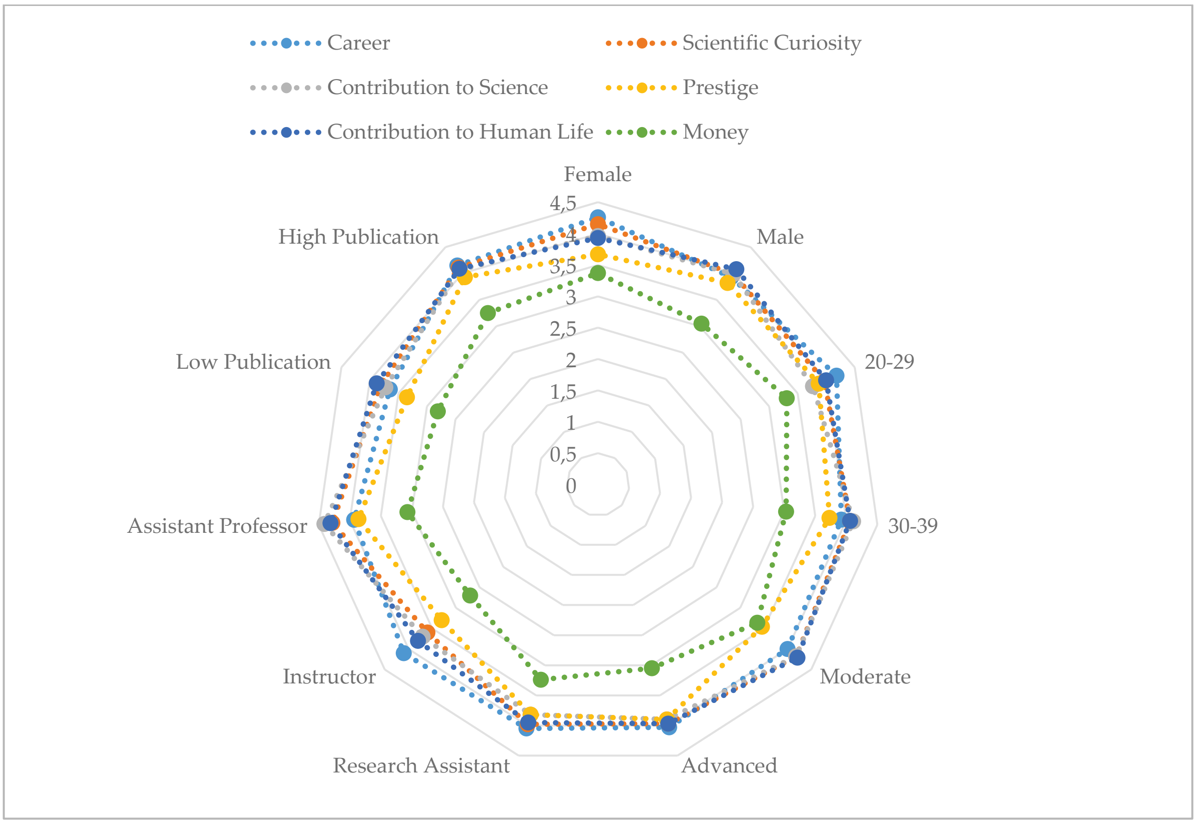
When Graph 1 was examined, it was seen that the young scholars regarded *money* as the lowest motivation element for scientific research. On the other hand, *contribution to human life* was considered to be the highest motivation source for scientific research. *Contribution to human life* was followed by *scientific curiosity, career, contribution to science* and *prestige*. The scholars' mean scores regarding their scientific research motivations with respect to their certain demographic features can be seen in Table 3 and Graph 2.

Table 3. Young Scholars' Motivation Mean Scores with Respect to Their Demographic Features

Motivations	Independent Variables	Demographic Features	$\bar{X}$
Career	Gender	Female	4.26
		Male	3.93
	Age	20-29	4.18
		30-39	3.92
	Technology use competency	Moderate	4
		Advanced	4.03
	Title	Research Assistant	4.05
		Instructor	4.1
		Assistant Professor	3.93
	University publication score	Low	3.65
		High	4.15

Table 3. Continue

Motivations	Independent Variables	Demographic Features	$\bar{X}$
Scientific Curiosity	Gender	Female	4.15
		Male	3.99
	Age	20-29	3.97
		30-39	4.06
	Technology use competency	Moderate	4.18
		Advanced	3.97
	Title	Research Assistant	3.98
		Instructor	3.6
		Assistant Professor	4.28
	University publication score	Low	3.81
		High	4.11
Contribution to Science	Gender	Female	3.96
		Male	3.99
	Age	20-29	3.77
		30-39	4.11
	Technology use competency	Moderate	4.18
		Advanced	3.9
	Title	Research Assistant	3.82
		Instructor	3.7
		Assistant Professor	4.41
	University publication score	Low	3.73
		High	4.07
Prestige	Gender	Female	3.67
		Male	3.82
	Age	20-29	3.87
		30-39	3.73
	Technology use competency	Moderate	3.46
		Advanced	3.9
	Title	Research Assistant	3.82
		Instructor	3.3
		Assistant Professor	3.86
	University publication score	Low	3.35
		High	3.93
Contribution to Human Life	Gender	Female	3.93
		Male	4.08
	Age	20-29	4
		30-39	4.06
	Technology use competency	Moderate	4.21
		Advanced	3.97
	Title	Research Assistant	3.95
		Instructor	3.8
		Assistant Professor	4.31
	University publication score	Low	3.88
		High	4.09
Money	Gender	Female	3.37
		Male	3.05
	Age	20-29	3.31
		30-39	3.03
	Technology use competency	Moderate	3.36
		Advanced	3.05
	Title	Research Assistant	3.24
		Instructor	2.7
		Assistant Professor	3.07
	University publication score	Low	2.81
		High	3.25



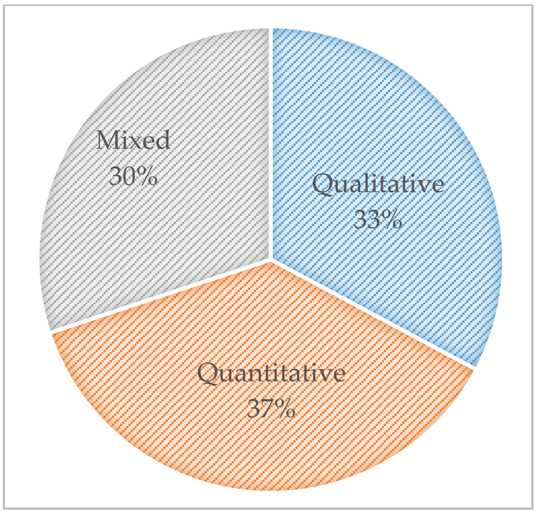
Graph 2. Radar Graph for Scientific Research Motivations

When Table 3 and Graph 2 were examined, it was seen that all the motivation elements except for "money" had high mean scores in general. When the data were examined in detail, it was found that the scholars from high publication score universities had higher mean scores for all the motivations elements than the scholars from low publication score universities. It was seen that female scholars had higher mean scores for *money* and *career* than male scholars (MD=.32, MD=.33). In terms of age, the scholars aged between 20 and 29 also had higher mean scores for the elements of *money* and *career* than those aged between 30 and 39. Another striking result was that the scholars with a moderate level of technology use competency much higher mean scores for the element of *money* than those with an advanced level of technology use competency (MD=.31). In terms of title assistant professors also had higher mean scores for the elements of *money* and *career* than research assistants.

In order to examine the young scholars' scientific research motivations with respect to their gender, ages, technology use, title and university publication rank independent samples t-test and One-way ANOVA test was run. The results of the analysis revealed a significant difference with respect to university publication ranks regarding the *career* [$t_{(99)}$=2.39, p=.019<.05, MD=.49] and *prestige* [$t_{(99)}$=2.66, p=.009<.05, MD=.58] research motivations. According to this finding, the scholars from high publication score universities see both *prestige* and *career* as scientific research motivation significantly higher than scholars from low publication score universities. Also a significant differences revealed for *contribution to science* with respect to titles of scholars [$F_{(2,98)}$ = 4.527, p=.013<.001]. In order to determine which groups caused the significant difference, Bonferoni test, one of the most common post-hoc (multiple comparison) tests, was used. To the results of post-hoc test, assistant professors see *contribution to science* as scientific research motivation significantly higher than research assistants.

Scientific Research Paradigms

In this study, young scholars' scientific research paradigms were examined from three basic paradigm aspects: qualitative, quantitative and mixed. Graph 3 presents the mean scores assigned by 101 young scholars to scientific research paradigms.

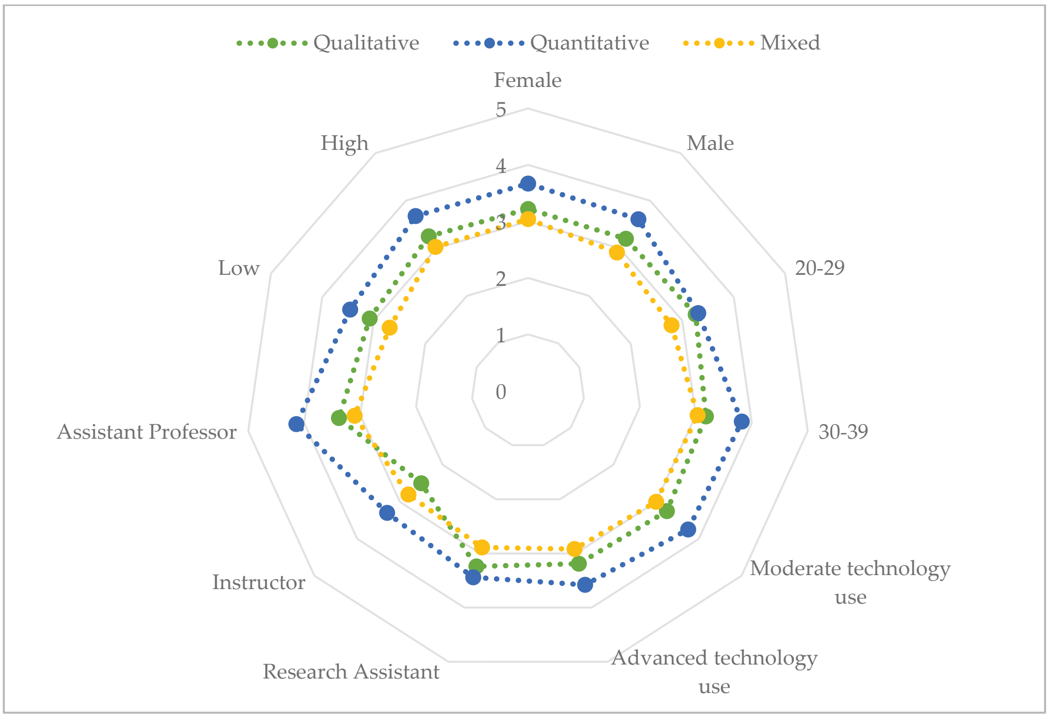


Graph 3. Young Scholars' Scientific Research Methodological Paradigms

When Graph 3 is examined, it is seen that in their scientific studies, the young scholars supported the quantitative paradigm at most with a mean of ($\bar{X}$=3.62) and that they supported the mixed research paradigm at least. Table 4 and Graph 4 present the young scholars' mean scores regarding the scientific research paradigms with respect to their demographic features.

Table 4. Participants' Paradigm Mean Scores with Respect to Their Demographic Features

Independent Variables	Demographic Features	Qualitative ($\bar{X}$)	Quantitative ($\bar{X}$)	Mixed ($\bar{X}$)
Gender	Female	3.22	3.67	3.04
	Male	3.2	3.61	2.91
Age	20-29	3.26	3.31	2.79
	30-39	3.18	3.82	3.03
Technology use competency	Moderate	3.25	3.75	3
	Advanced	3.19	3.58	2.92
Title	Research Assistant	3.24	3.44	2.89
	Instructor	2.5	3.3	2.8
	Assistant Professor	3.38	4.14	3.1
University publication score	Low	3.08	3.46	2.69
	High	3.25	3.68	3.03



Graph 4. Radar Graph of Scientific Research Methodological Paradigms

As can be seen in Graph 4 and in Table 4 (more detailed), the quantitative paradigm was favored by the assistant with the highest mean score ($\bar{X}$=4.14). The results of the parametric tests revealed a significant difference in quantitative paradigm with respect to age [$t_{(99)}$=2.62, p=.01<.05, MD=.49] and title [$F_{(2,98)}$ = 4.527, p=.013<.001]. This finding demonstrates that scholars aged between 30 and 39 ($\bar{X}$=3.82) favored the quantitative paradigm significantly more than those aged between 20 and 29 ($\bar{X}$=3.31). In order to determine which groups caused the significant difference, Bonferroni test, one of post-hoc (multiple comparison) tests, was used. As a result of multiple comparison test, assistant professors preferred quantitative paradigm more than research assistants significantly (MD=.702, p=.004<.05).

Relationship between Scientific Research Motivations and Scientific Research Paradigms

When the young scholars' scientific research motivations and their scientific research paradigms were examined, the variables that caused the relationship between these variables were determined. Table 5 below presents the correlation matrix between scientific research paradigms and scientific research motivations.

Table 5. Correlation Matrix between Scientific Research Paradigms and Scientific Research Motivations

	Career	Scientific Curiosity	Scientific Contribution	Respect	Contribution to human life	Money
Qualitative	.114	.164	.131	.128	.164	.010
Quantitative	.183	.465**	.562**	.180	.430**	.125
Mixed	-.124	-.010	.119	-.109	.003	-.076

N=101, ** Correlation is significant at the 0.001 level (two-tailed).

When the scientific research paradigms and scientific research motivations were examined, it was seen that there was a medium level of positive relationship between quantitative paradigm and scientific curiosity (r=+.465), scientific contribution (r=+.562) and contribution to human life (r=+.430). This finding demonstrates that young scholars' support for quantitative paradigm in their scientific research changes with the motivations of scientific curiosity, scientific contribution and contribution to human life and that they are all interrelated. The high correlation coefficient between the variables demonstrates that these two variables are interrelated and that they change together. As this correlation shows only the simultaneous change, the linear relationships between the variables were examined with path analysis to determine causality. In order to predict the relationships between the variables, the Maximum Likelihood Method was used. Figure 3 presents the results of the path analysis conducted to determine the extent to which the scholars' scientific research motivations predicted their scientific research paradigm preferences, and Table 6 shows the non-standardized regression values (β).

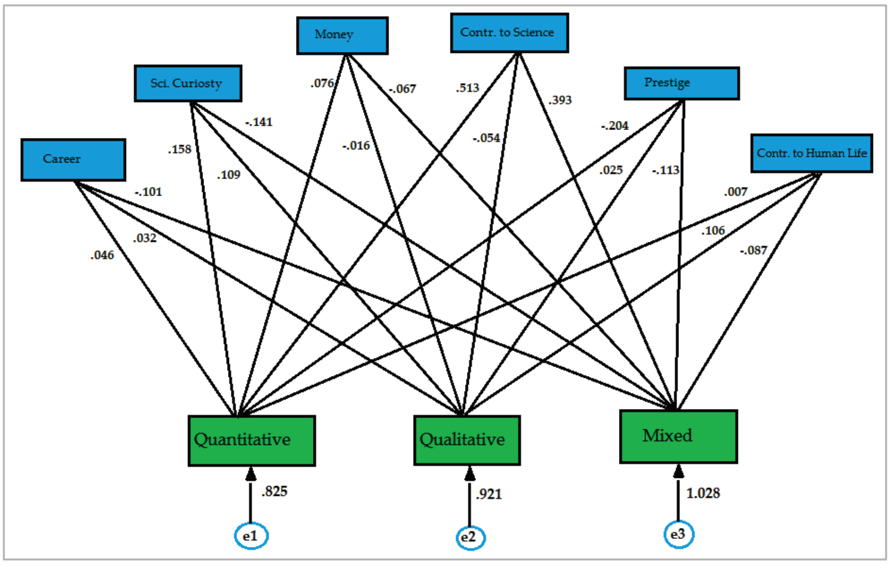


Figure 3. The Diagram Showing the Extent to which the Scholars' Research Motivations Predicted Their Scientific Research Paradigm Preferences

Table 6. Regression Weights of the Variables

	β	SH	Critical Ratio	*p* (two tailed)
Qualitative <---Money	.031	.559	.240	.811
Qualitative<---Career	.119	.129	.659	.512
Qualitative<---Scientific Curiosity	-.012	.180	-.152	.879
Qualitative<--- Contribution to Science	-.051	.081	-.298	.766
Qualitative<---Respect	.023	.170	.174	.862
Qualitative<---Contribution to human life	.109	.130	.637	.526
Quantitative<--- Money	.049	.115	.422	.674
Quantitative<--- Career	.188	.162	1.163	.248
Quantitative<--- Scientific Curiosity	.065	.072	.903	.369
Quantitative<--- Contribution to Science	**.529**	**.152**	**3.475**	**.001**
Quantitative <--- Respect	-.202	.117	-1.733	.086
Quantitative<--- Contribution to human life	.008	.153	.053	.958
Mixed<--- Money	-.113	.143	-.788	.433
Mixed<--- Career	-.176	.201	-.877	.383
Mixed<--- Scientific Curiosity	-.060	.090	-.663	.509
Mixed<--- Contribution to Science	**.425**	**.190**	**2.239**	**.028**
Mixed<---Respect	-.118	.145	-.810	.420
Mixed<--- Contribution to human life	-.102	.191	-.533	.595

Path models use the regression analysis and correlation coefficients for the modelling of more complex relationships between the observed variables. As can be seen in Figure 3 and Table 6 (more detailed), the young scholars' scientific research motivations of *contribution* to *science* (β=.529, p=.001) significantly predicted the *quantitative* paradigm. In addition, the young scholars' scientific research motivation of *contribution* to *science* (β=.425, p=.028) also predicted the *mixed* paradigm significantly as well. The regression weights presented in Table 6 are standardized coefficients (β), and one-unit increase in the motivation scores refers to an x unit increase in the scientific research paradigm scores.

Discussion

In this study, several striking findings were obtained. One of the important findings was related to the young scholars' scientific research motivations. The highest mean scores were of *Contribution to human life, scientific curiosity, career, contribution to science*, and *prestige* respectively. Also, the young scholars considered *money* to be the lowest motivation element for scientific research. Depending on this finding, it could be stated that all the five motivation elements except for *money* were close to one another. These four motivation elements can be regarded as intrinsic motivation. Thus, considering the limitations of the study, ICT-oriented young scholars make use of intrinsic motivation elements to conduct research. This result is consistent with the intrinsic motivation weighted model put forward by Deemer et al. (2010).

In the study, it was a striking result that the scholars who did not consider themselves to have competency in technology use had more extrinsic motivation. The reason could be the fact that the scientific research cultures of scholars who lack technology use competency may not be developed or that those with developed technology use may develop a better research culture. This finding support Driscoll and Dick's (1999) assumption that scholars using ICTs develop themselves in terms of scientific research by communicating and sharing with other scholars.

When the young scholars' scores were examined with respect to scientific research methodology paradigms, the most popular scientific research paradigm was quantitative paradigm, and the least was mixed paradigm. According to parametric test results, the scholars from high publication score universities see both *prestige* and *career* as scientific research motivation significantly higher than scholars from low publication score universities. Also, it was revealed that assistant professors see *contribution to science* as scientific research motivation and support *quantitative* paradigm significantly higher than research assistants.

Higher average preference of quantitative paradigm of female researchers than male researchers is also noteworthy. This result is different from the assumption of Easterday et al. (1977) that female researchers are prone to field research in scope of qualitative methods.

When the young scholars' scientific research motivations and their scientific research paradigms were examined, path analysis was conducted to determine which variable(s) caused the relationship in-between. As a result of path analysis, among scientific research motivations *scientific contribution* significantly predicted *quantitative* paradigm and mixed paradigm.

Conclusion and Suggestions

Scientific research has undergone important changes throughout the history. One of the developments fairly influential on science, scientific research, scientific methodology and thus on scholars' scientific research motivations is the ICTs which have rapidly spread since the last quarter of the 21st century. In the present study, the scientific research motivations and methodology paradigms of 101 young scholars from 8 different universities who use ICTs in their studies were examined.

One important result was related to the young scholars' scientific research motivations. Accordingly, it was concluded that young scholars are encouraged by the intrinsic motivation elements of *contribution to human life* and *scientific curiosity* to conduct scientific research. This result supports the Deemer et al. (2010) intrinsic motivation based scientific research motivation model. In addition, it was seen that young academicians consider *money* to be the lowest motivation factor for their scientific research. This element was favored with the highest mean by the female scholars and who did not find themselves efficient in technology use. Depending on this finding, for the training of young scholars who will contribute to the future of science, it could be suggested that particular importance can be given to scientific ethics and scientific research culture and that technology can be used effectively.

Another finding obtained in the present study was related to young scholars' scientific research methodology paradigms. Accordingly, the most popular scientific research paradigm was *quantitative* paradigm, while the least popular one was *mixed* paradigm. Depending on these findings and considering the limitations of the study, it could be stated that more experienced scholars and those with a higher level of title tend to prefer *quantitative* paradigm. Thus, even though ICTs have in-depth influence on science and scientific research, it could be stated that new paradigms are not sufficiently adopted by young scholars. Therefore, for post-graduate education, the course contents could be updated to provide young scholars with more effective examples of current scientific research methods.

The last finding was obtained in the present study as a result of path analysis conducted to examine the relationship between scientific research motivations and scientific research paradigms. Accordingly, no scientific research motivation significantly predicted qualitative paradigm, while the elements of *scientific contribution* significantly predicted both *quantitative* and *mixed* paradigm. In order to elaborate this finding and to develop a comprehensive model for the reflection of the relationship between scientific research motivations and methodological paradigms, more comprehensive studies could be conducted.

This research is limited to 101 scholars from 8 universities in Turkey, "Scientific Research Motivations and Methodological Paradigms Survey" and applied statistical analysis. This research is based on assumption that scholars expressed their views and comments clearly.

Based on the findings of the present study, several suggestions could be put forward for future studies. First of all, meta-analysis studies could be conducted on national and international basis to investigate the effects of ICTs on scientific research methods, the number of publications and on the research subjects. This could help fill the gap in international literature. Secondly, factor-determining studies could be conducted with a high number of participants from different fields to reveal scientific research motivations, and scale-development studies could be designed regarding scientific research motivations. Lastly, a structural equation modelling could be done to develop a comprehensive model to reflect the relationship between scientific research motivations and methodological paradigms with more participants with different demographic features and from different fields. In this way, the structure of the relationship between scholars' scientific research motivations and methodological paradigms in their scientific research could be explained.

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