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Researchers' Perceptions of Scientific Research and Educational Research[1]

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Abstract

The researchers of educational faculties conduct educational research, pure scientific research or discipline-based educational research as to their interest. All of these researches are important and contribute to the improvement of these faculties. However, as these faculties take the name of education, there are some opinions that show educational and discipline-based educational research should be more focused on. On the other hand, pure scientific researchers believe that the kernel of science is pure scientific research. Based on these arguments, this study tried to give voice to researchers of educational faculties. Thus, the aim of this study is to identify researchers' perceptions of scientific research (SR), pure scientific research (PSR), educational research (ER) and discipline-based educational research (DBER). To achieve this goal, phenomenology was carried out. The sample was formed through maximum variation sampling. The participants of the study consisted of 10 researchers working at Atatürk University Kâzım Karabekir Education Faculty. The data obtained through semi-structured interviews were analyzed through content analysis. The findings showed that the researchers described the SR as a systematic process of gathering and analyzing data; PSR as theoretical research which tried to understand the nature of a discipline; ER as an applied research related to education and training; and DBER as a combination of ER and PSR. Moreover, it was seen that the researchers believed that DBER did not contribute to the educational system of country due to some reasons such as policy and lack of DBER researchers.

Keywords: Scientific research, educational research, pure scientific research, discipline-based educational research, researcher

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Araştırmacıların Bilimsel Araştırma ve Eğitim Araştırması Algıları

Öz

Eğitim fakülteleri araştırmacıları eğitim araştırmaları, alan araştırmaları ve alan eğitimi araştırmaları yapmaktadırlar. Tüm bu araştırma türleri önemlidir ve fakültelerin gelişimine katkı sağlamaktadır. Ancak, bazı araştırmacılar, eğitim fakültesi olduğu için eğitim ve alan eğitimi araştırmalarının daha fazla önemsenmesi gerekliliğini belirtmektedir. Öte yandan, alan araştırmacıları bilimin çekirdeğini alan eğitimi araştırmalarının oluşturduğunu ileri sürmektedir. Bu argümanları baz alan bu çalışma, eğitim fakültesi araştırmacılarına kulak vermeye çalışmıştır. Bu kapsamda, çalışmanın amacı, araştırmacıların bilimsel araştırma, eğitim araştırmaları, alan araştırmaları ve alan eğitimi araştırmaları algılarını belirlemektir. Bu amacı gerçekleştirmek için, olgubilim deseni tercih edilmiştir. Maksimum çeşitlilik örnekleme yöntemi ile belirlenen örneklemde Atatürk Üniversitesi Eğitim Fakültesi'nde çalışan 10 araştırmacı yer almıştır. Görüşme yoluyla elde edilen veriler içerik analizine tabi tutulmuştur. Analiz sonucuna göre, araştırmacılar bilimsel araştırmayı veri toplama ve analiz etmenin sistematik süreci, alan araştırmasını bir disiplinin doğasını analamaya çalışan kuramsal araşatırma, eğitim araştırmasını eğitim ve öğretimle alakalı olan uygulamalı araştırma ve alan eğitimi araştırmasını eğitim ve alan araştırmalarının birleşimi olarak tanımlamaktadır. Ayrıca, alan eğitimi araştırmalarının politika ve alan eğitimi araştırmacı sayısının azlığı gibi nedenlerden dolayı ülkenin eğitim sistemine katkı sağlamadığı sonucuna ulaşılmıştır.

Anahtar Kelimeler: Bilimsel araştırma, eğitim araştırması, alan araştırması, alan eğitimi araştırması, araştırmacı

Introduction

It has been commonly accepted that teachers should have content knowledge (CK), pedagogic knowledge (PK) and pedagogic content knowledge (PCK). Thus, the researchers conducted in faculties of education can be grouped as pure scientific research (PSR) which aims at improving CK, educational research (ER) aiming at improving PK and discipline-based educational research (DBER) aiming at improving PCK. The researchers of education faculties are inclined to carry out one or two of these types of research. Some researchers believe that CK should be the first, as without CK what is taught would be incomplete, so they tend to focus mostly on PSR. On the other hand, some researchers believe that ER or DBER is more important as the aim of education faculties is to train teachers. DBER, emerging as a discipline later from pure scientific and educational research, is a separate topic of discussion among researchers. In fact, the nature of scientific research including these research experiences is subject of discussion. It is certainly true that researchers know what is research and they have their own ideas about the nature of research but these ideas are not examined (Brew, 2001). The researchers' perceptions of research have not been investigated in faculties of education context in Turkey. Thus, in this study, the scientific research (SR), PSR, ER and DBER perceptions of researchers working in faculty of education at Ataturk University in Turkey were investigated.

Scientific research (SR)

The term of SR can be defined as "the systematic process of collecting and logically analyzing data (i.e. evidence-based) for some purpose" (McMillan and Schumacher, 2014, p. 16). SR is following a systematic path to get knowledge about a problem. It

can be classified as basic research, applied research, evaluative and action research. As this study is concerned with PSR, ER and DBER, the terms of basic and applied research will be addressed. Basic research, which is also called as pure or fundamental research, is conducted to understand a concept or phenomenon. It provides basic knowledge in a field. It tries to shed light on underlying processes through the hypotheses that are generally pointed as theories (Fraenkel, Wallen & Hyun, 2012). Although its main aim is to develop knowledge and understanding in any particular area, the knowledge developed could be used in the same area or other areas, too. On the other hand, applied research deals with answering "real-world, practical questions to provide relatively immediate solutions" (Johnston & Christen, 2004, p. 9). The research problems of the applied research consist of current questions in education. As applied research is concerned with the practices in education, it is generally associated with educational research.

Educational research (ER)

Educational research emerged as a discipline in 1950s and 1960s, but its origin goes back to 19th century when the notion that the research should guide practice and policy in education came to light (Nisbet, 2005). Nisbet states that there are three phases of educational research. In phase 1, the educational researcher is an academic theorist, s/he is an expert consultant in phase 2 and a reflective practitioner in phase 3. These phases show that educational research approaches to practice day by day. Is practice a part of educational research? To be able to answer this question, it is necessary to know about the scope, content, components and aspects of educational research. What is educational research? Is it possible to give an accurate, unique and well-accepted definition? It seems that it is not possible as researchers have different opinions about the understanding, nature, aims and methods of educational research (Vanderline & van Braak 2010). Furlong (2004) states that the fact that every approach to educational research has an epistemological foundation affects the research questions and methods. Thus, differences about the definition of educational research have emerged.

Although, there is no a clear definition, educational research can be defined as research that is related to student learning, teaching methods and teacher training. Biesta (2007) stresses that educational research is the research for education and on education. Mortimore (1999) identifies four main tasks of educational research which are a) to observe and record systematically, b) to analyze and draw out implications, c) to publish findings, and d) to attempt to improve educational processes and outcomes. Some researchers relate the educational research directly to practice (Burkhardt & Schoenfeld, 2003; Hemsley-Brown & Sharp, 2003; Vanderlinde & van Braak, 2010). Furthermore, they asses the value of research as its contribution to practice. According to them, practitioners (teachers and administrators) can and should benefit from the results of educational research. Due to its contribution to educational practice, educational research is associated with applied research. On the other hand, Mortimore (1999) stresses that the success of the educational research in practice and policy should not cause the researchers to not see its shortcomings such as "gaps in knowledge, the inaccessibility of some writing, the mediocrity of some work, and the ways in which researchers relate to those involved in, or affected by,

research or those whom it is hoped will be influenced by it" (p. 1). It is seen that although educational research is crucial in improving educational systems of countries, it has some weaknesses leading to not meeting the expectations satisfactorily.

Discipline-based educational research (DBER)

Doing educational research specific to a discipline gives birth to another concept: DBER (Discipline-based Educational Research). However, the acceptance of DBER as a discipline is far later from the origin of educational research. In fact; this type of research can be encountered in 1900s, but it emerged more prominently in 1980s and 1990s (Singer, Nielsen & Schweingruber, 2012). DBER began with STEM (Science, Technology, Engineering and Mathematics). And the initiative of the STEM was the launch of Sputnik in 1957 by Russia. After this event, USA Congress passed the NDEA (National Defense Education Act) that invested billions on education system especially the education of astronauts, engineers and scientists. Thus, scientific research increased greatly at that time.

DBER emerged firstly in the branch of Physics and it got the name of Physics Educational Research. National Academy of Sciences of USA wrote a report about DBER which defined DBER as an enterprise that "investigates learning and teaching in a discipline from a perspective that reflects the discipline's priorities, worldview, knowledge and practices" (p. 1). The report presents some goals of DBER which are to:

- understand how people learn the concepts, practices, and ways of thinking of science and engineering;
- understand the nature and development of expertise in a discipline;
- help identify and measure appropriate learning objectives and instructional approaches that advance students toward those objectives;
- contribute to the knowledge base in a way that can guide the translation of DBER findings to classroom practice; and
- identify approaches to make science and engineering education broad and inclusive (p.2).

As this report focuses on the DBER on the field of science and engineering, some of the goals are related to the specifics of the field. However, these goals can be generalized to other disciplines.

Researchers' perceptions of scientific research

In literature, there are few studies about the researchers' perceptions of scientific research. Some of these studies are specific to a discipline such as Information and Communication Technology (ICT) researchers' perceptions (Bruce, Pham & Stoodley, 2014) and Teaching English as a Foreign Language (TEFL) academics (Bai & Hudson, 2011; Bai & Millwater, 2011; Bai, Millwater & Hudson, 2012). These studies focus on researchers' perceptions of significance, value and benefit of scientific research or research-teaching nexus but not directly to what research means to the researchers. There are few studies which focus on this dimension (Brew, 2001; Kiley and Mullins 2005; Prosser et al. 2008). In these studies, generally three questions were focused: what is research, what are the qualities of a good research and what are the qualities

of a good researcher? Kiley and Mullins (2005), Brew (2001), and Prosser et al. (2008) answered the first question under four categories emerging from data analysis. Although the titles of the categories were different, they were similar in terms of their content. In Brew's study where 57 academicians were interviewed, the scientific research was associated with "domino", "trading", "layer", and "journey" concepts. *Domino* category shows that the researchers view research as a "series of separate tasks, event things, activities, problems, techniques, experiments, issues, ideas or questions, each of which is presented as distinct" (p. 276). The category of *trading* reflects the social aspect of the research. Products of research such as publications, grants and social networks are important. In *layer* aspect, what is in the foreground are data, previous theories or ideas. Finally, the *journey* shows that the activities that the researchers are engaged in are relevant to research as these activities inform the life issues that underpin the research questions.

Kiley and Mullins (2005) also suggest four categories that define the aspects of scientific research. These categories are technical, creative/innovative, integrating complexity, and new ways of seeing. Different from Brew, Kiley and Mullins identify the qualities of a good research and researcher as to these categories. *Technical research* is "a scholarly process characterized by the rigorous applications of systematic methods" (p. 249). The technic in that method is seen important. The two-thirds of supervisors emphasized this aspect of the research. As to this aspect, a good research is methodical, objective, systematic, original, significant, ethical, carefully interpreted, relevant, and problem-driven. The *creative/innovative* aspect reflects creative and innovative aspect of research. A good research is creative, inspiring, and exciting. *Integrating complexity* shows that the supervisors think that the research is bringing together complex knowledge and data in new ways. A good research is holistic, widely applicable, speculative, and non-formulaic. Finally, *new ways of seeing* stresses that one can see the world in new ways thanks to research. A good research generates new lines of inquiry and opens new views.

Prosser et al. (2008) also identify four categories as to the definition of the scientific research by 37 academicians. They gave letter to these categories: A, B, C, D. In category *A*, the research is seen as a series of projects that are independent and self-contained. Research is done for the benefit of profession or society. In category *B*, the research is "the further development of a series of field-of-study-based concepts, issues or procedure that are linked and integrated coherently" (p. 9). Research is done to add to or expand the field. In category *C*, the research includes use of existing technical mechanisms, but the focus is theory development that uses established theoretical constructs. The category *D* shows that the research is inquiry-focused and open-ended as it creates more questions to be answered. The research is done to change the field.

When these three studies are compared, it is seen that the contents are similar although the names are different (see Table 1).

Table 1
Comparison of the Scientific Research Perceptions Categories

Brew (2001)	Kiley & Mullins (2005)	Prosser et al. (2008)
Domino	Technical	A
Trading	Creative/Innovative	B
Layer	Integrating complexity	C
Journey	New ways of seeing	D

As the studies focus on researchers' perceptions on educational research, there are some studies that generally take teachers' opinions (Ekiz, 2006, Everton, Galton & Bell, 2002; Isakson & Ellworth, 1978, 1979; Williams & Coles, 2003). These studies try to determine the attitudes and perceptions of the teachers who implement the educational research. However, there are no studies that try to identify the perceptions of researchers who actually do the research. Not only on ER but also on DBER is there any research in literature. Thus, this study aims to fill this gap in the literature. Particularly response was sought to the following research questions:

1. How do researchers working in faculty of education perceive scientific research?
2. How do researchers working in faculty of education perceive educational research?
3. How do researchers working in faculty of education perceive pure scientific research?
4. How do researchers working in faculty of education perceive discipline-based educational research?

Researchers' perceptions are important in Turkish context for the reason defined below. Education faculties in Turkey employ researchers from three different research backgrounds. The first group of researchers are those who are experts in basic science disciplines such as biology, chemistry, physics, mathematics, history, and geography and they have a pure scientific research background, while the second group of researchers come from psychology and educational sciences and they mostly define themselves as educational researchers. The third group consists of DBER researchers who are doing research in the interface of a discipline such as chemistry and educational research and they define themselves as chemistry educators. This group of researchers have knowledge and expertise of both disciplines like a subject background and educational research background. Therefore, DBER is called as a hybrid discipline. As the above three groups' practices of research are rather different from each other's, their perceptions of the scientific research differ. Thus, it was aimed to see how these three group of researchers' perceptions were. The results of this study may help education and science community to bring those different group of researchers into a common

understanding in terms of scientific research and its application in different areas of practice.

Method

Design of the study

This qualitative study employed phenomenology as the research design. Phenomenological studies describe "the meaning for several individuals of their lived experience of a concept or a phenomenon" (Creswell, 2007, p. 57). The perceptions of academics, who experience research, on scientific research, educational research, pure scientific research and discipline-based educational research were tried to be described in this study. Thus, phenomenology was preferred.

Participants

The participants of this study consisted of 10 researchers working at Atatürk University Kâzım Karabekir Education Faculty. The participants were selected using the maximum variation sampling of purposive sampling methods. As this study aimed at identifying perceptions of researchers with backgrounds in different teaching fields and from different research groups, this sampling method was preferred. 10 academicians were involved in the study. The profile of these participants was summarized in Table 2.

Table 2
Profile of the Participants

	Gender	Academic Title	Teaching Field	Research experience
Participant 1	M	Associate Professor	Philosophy Teacher Training	PSR
Participant 2	M	Associate Professor	Computer & Instructional Technology Teacher Training	DBER
Participant 3	M	Assistant Professor	English Language Teaching	DBER
Participant 4	M	Research Assistant	History Teacher Training	DBER
Participant 5	F	Research Assistant	English Language Teaching	DBER
Participant 6	F	Research Assistant	Philosophy Teacher Training	PSR
Participant 7	M	Assistant Professor	English Language Teaching	PSR
Participant 8	M	Assistant Professor	Guidance and Counseling	PSR+ER
Participant 9	F	Full Professor	History Teacher Training	PSR
Participant 10	M	Research Assistant	Curriculum and Instruction	ER

Data collection and analysis

In order to determine the perceptions of researchers, interview was used as the data collection tool. 14 open-ended questions were asked to the participants and the answers were recorded. At first, 15 questions were formed. Then, three pilot

interviews were carried out. After these pilot interviews, one question was excluded and some questions were revised. The questions of the interview aimed to learn what the researchers' thought about the meaning and importance of SR, ER, PSR and DBER. Thus, questions such as "What are the qualities of a good research?" and "What do you think about the place of the educational research in scientific research?" (see Appendix) were asked. The interviews lasted for 15-45 minutes. All interviews were verbatim transcribed and analyzed. The transcriptions of these interviews were subject to content analysis. The content analysis was conducted by using Nvivo. The transcriptions of the interviews were uploaded to Nvivo and the codes were formed. The data obtained through question of "How do you define scientific research?" were coded as to Kiley and Mullins' (2005) categories which were technical, creative /innovative, integrating complexity and new ways of seeing. The other codes were obtained through content analysis. The researchers read all the transcriptions and determined the codes and then themes. Two of the researchers coded the transcriptions to provide reliability. The other researcher checked the codes. When three researchers agreed upon the codes and themes, the analysis was completed.

Findings

The data analyzed with content analysis were presented based on the research questions. Each research question was tried to be answered under its own heading. The codes were presented with frequencies which were based on units not person.

Researchers' perceptions of SR

To identify the researchers' perception of SR; the themes which were definition of scientific research, characteristics of a good research, description of basic research and conception of applied research were formed.

The answers of "What is scientific research?" were analyzed by using Kiley and Mullins (2005) codes which were technical, creative/innovative, integrating complexity and new ways of seeing. These codes and its frequencies were presented in Table 3.

Table 3
Definition of SR

Codes	*f*
Technical	8
Creative/innovative	2
New ways of seeing	1
Integrating complexity	1

In this study, the code of technical means systematicity and the process of gathering and analyzing data. As can be seen in Table 3, most of the researchers emphasized the technical aspect of the research (*f=8*). The Turkish researchers perceive the SR as a systematic process in which data on a specific subject are collected and analyzed. The following quotation can be given as an example for technical aspect of SR: "*A process where a problem is tried to be understood in the*

framework of some norms and rules, is analyzed, and some results and solutions are produced based on some findings" (Participant 3).

In the creative dimension of the SR the term of "new" is important. Generating new knowledge is included in this aspect. Two researchers defined SR by stressing this aspect. One of them explained the SR as following: "*The scientific research is the research that brings new things in a subject to a discipline; it is original and it makes feel that something new is found." (Participant 6)*

The other aspects of scientific research which were new ways of seeing (using different perspectives in understanding) (*f=1*) and integrating complexity (bringing the complex data together) (*f=1*) were the least stressed aspects of the scientific research.

To get a deeper understanding about the researchers' research perceptions, the question of "In your opinion, what are the characteristics of a good research?" was asked. The answers were coded and presented in Table 4.

Table 4
Characteristics of A Good Research

Codes	f
Valid and reliable	4
Has a good literature review	4
Useful	4
Original	4
Objective	3
Proposes solution to the problems	3
A good theoretical framework	2
The right method	2
Has scientific ethic	2
Applies of scientific steps without skipping	2
Current	1
Comprehensive	1
Fills the gap in the literature	1
Brings a new solution	1
States the purpose clearly	1

As can be seen in Table 4, the most uttered characteristics of a good research were validity and reliability, usefulness, originality and a well written literature review (*f=4*). The second most emphasized characteristics were objectiveness and proposing solutions to the problems (*f=3*). To have a good theoretical framework and scientific ethic, application of scientific steps without skipping any of them, and choosing the right method were stressed by two researchers. Moreover, the research that was current, comprehensive, bringing a new solution, filling the gap in the literature and stating the purpose clearly (*f=1*) was a good research as to the researchers.

The researchers were asked to also define basic research and the findings were presented in Table 5.

Table 5
Description of Basic Research

Codes	*f*
Theoretical research	6
Pure scientific research	1
The research done to generate knowledge	1
The research creating resources for applied research	1
The research focusing on the basic concepts and outcomes of a discipline	1
General research	1
The research done for satisfying curiosity	1
The research bringing new perspective to an existing problem that is not adequately scrutinized	1

Table 5 indicates that most of the participants taking part in this study defined basic research as theoretical research (*f=6*). A quotation from *Participant 6* can be given example to this finding:

> *I think basic research is more theory oriented. I mean what is suggested theoretically in any field, which perspectives are brought, what is the previous accumulation of knowledge, and which methods have been used; I think basic research is researching these questions…*

There were also some opinions like that basic research was the research which created resources for applied research (*f=1*), generated knowledge (*f=1*), focused on the basic concepts and outcomes of a discipline (*f=1*), general research (*f=1*), satisfied curiosity (*f=1*), brought new perspective to an existing problem that had not been adequately scrutinized (*f=1*).

Another question was about the applied research. The findings related to the researchers' perceptions of applied research were presented in Table 6.

Table 6
Description of Applied Research

Codes	f
Putting the knowledge into practice based on theory	3
Presenting the results of scientific methods	2
Testing the new information	1
Educational research	
Educational and discipline-based educational research	1
The process of finding answers to some concrete problems caused by a specific application	1
Testing information obtained by scientific research by using it in a process useful to humanity	1

Although the researchers' applied research perceptions show differences (see Table 6), 3 researchers were of the same opinion that applied research was putting the knowledge into practice relying on theory. On the other hand, two researchers regarded applied research as the research that presented the results of scientific

methods. While 2 researchers put it on par with educational research, one researcher put it on par with discipline-based educational research. The other conceptions were as follows:

> *Applied research is a useful process to humanity, which we can describe, in which accumulation of knowledge which is obtained with scientific research is tested" (Participant 8).*

> *Applied research is the process of finding answers to much more concrete problems- than basic research-caused by a specific application. For example, what is the success and the ability of speaking abilities of students of English Language Teaching department in speaking course? This (to find answers to this problem) is a performance, an applied thing, an applied process. There is a concrete problem and we try to get some answers and bring solutions to this problem. This is an applied research" (Participant 3).*

Although many research books explain the applied research by focusing on the key term of applied research "providing solutions to the problems", only one of the participants of this study (*Participant 3*-see the excerpt above) stressed this aspect.

Researchers' perceptions of PSR

In order to answer the second research question, views about PSR were tried to be identified. The findings were presented in Table 7 which showed what the PSR meant to the researchers.

Table 7
Conceptions of PSR

Codes	*f*
Theoretical research	3
Objective and in-depth research in a discipline	1
Research not including education	1
Understanding the nature of a discipline	1
Research that forms the theoretical background	1
Gathering material for applied research	1
Research explaining basic concepts and problems in a discipline	1
Research revealing the problems that are not focused before	1
Research done to increase knowledge in a discipline	1

Table 7 indicates that the researchers do not agree upon the meaning of the PSR. However, three researchers were of the same opinion that PSR was theoretical research. The other meanings of PSR for the researchers included that the research which gathered material for applied research, explained basic concepts and problems in a discipline, revealed the problem that were not focused before. The following quotation form *Participant 9* who conducts PSR shed lights on characteristics of PSR.

> *We can describe the pure scientific research as the studies oriented to understand the nature of a discipline. I give some examples from my field, the studies that will reveal the nature and features of history can be given examples as pure scientific*

> *research… I think pure scientific research provides the theoretical background necessary for scientific research and the following research is done based on it… In my opinion, pure scientific research is important in forming the theoretical background.*

Researchers' perceptions of ER

In order to see researchers' perceptions of ER, questions such as "What is educational research? What are the characteristics of educational research? Is educational research basic research or applied research" were asked. The findings were presented in Table 8.

Table 8 shows that the term of educational research reminded applied research to all of the participants. All the participants regarded ER as the research including applications. On the other hand, six of the participants were of the opinion that ER could be evaluated also in the framework of basic research. Another most stressed definition of the ER was that any research that was related to education. Some of the participants made more *specific* definitions such as "*research that aims at increasing the student achievement*" *(Participant 10)* or "*research that makes the education process more effective and productive*" *(Participant 1*). "*action research*" (*Participant 5*) or "*research working with human*" (*Participant 8)*. And there was one researcher that related ER with the research that focused on lifelong learning activities. Mortimore (1999) also defines ER as "research ranges from studies of the learning of babies and young children, through the lifelong learning of the university of the third age and of those who learn outside of educational institutions (p.8)".

Table 8
Conceptions of ER

Codes	f
Applied research	10
Research related to education and training	9
Basic research	6
Any research related to school, teacher and student	2
Research that aims at increasing the student achievement	1
Research examining all learning-teaching activities in a person's life	1
Action research	1
Research working with human	1
Spending more time in schools	1
Research that makes the education process more effective and productive	1
Searching the methods used in transferring knowledge	1

Researchers' perceptions of DBER

The findings related to the last research question which was "How do researchers perceive discipline-based educational research?" were presented in Table 9 and 10 as two themes which were description and contribution of DBER.

The findings on researchers' description of DBER were presented in Table 9.

Table 9
Discipline-based Educational Research

Codes	*f*
The combination of pure scientific research and educational research	2
Research oriented to training specific to discipline	2
Research scrutinizing problems related to discipline and education	1
The applicability of education in a discipline	1
Explaining the theoretical aspect of knowledge	1
Showing how discipline is transferred to learner	1
Combining applied research instruments with theoretical knowledge	1

The researchers' perceptions of DBER shows variety (see Table 9). Two researchers stated that DBER was the research that combined PSR and ER. One participant also regarded DBER as a combination of applied research instruments and theoretical knowledge. On the other hand, two researchers were of the opinion that DBER was the research which was oriented to training specific to a discipline. The research focused on applicability of education and transmissibility of discipline, and on problems related to both education and discipline were the other DBER definitions made by the researchers. Apart from these perceptions, as interviewing researchers, one researcher stated that s/he did not identify DBER as a separate field, to him/her, there were only PSR and ER but not another research field as DBER. Besides, one researcher expressed that DBER and ER was the same thing in deed.

It is expected that both ER and DBER have some contributions to the education system of a country. However, it is questionable if they really contribute. Thus, it was asked to the participants if DBER had any effect on the education system in Turkey. The findings were presented in Table 10.

Table 10
The Contributions of DBER on Education System

Codes	*f*	Codes related to reasons	*f*
It contributes	3	Education policies are redesigned	1
		Education-training programs are formed and reformed	1
		DBER shows how to transfer the knowledge in a discipline to the students ideally	1
It does not contribute	7	Political reasons	3
		Discipline based education is ignored	1
		Lack of DBER researchers	1
		DBER researchers do not share their finding with education politician	1

Table 10 shows that seven of the participants explained that DBER did not have any contribution to education system. 3 of these participants regarded political issues responsible for not contributing. They believed that educational institutions

such as Ministry of National Education and Higher Education Council were in fact political institutions and when the politicians changed, the education system also changed. The excerpt from *Participant 7* highlights this opinion:
"Ministry of National Education is a mechanism that approaches the education politically. The one who has the sword cuts one rope and knots the other. Thus, the sustainability is questionable in terms of putting the results of research into practice."

The other reasons were the ignorance of DBER and lack of DBER researchers. Moreover, one researcher regarded the researchers as responsible for this situation as s/he believed that the researchers did not collaborate with education politicians. Thus, s/he suggested that the researchers should report their research and present to the people who were in charge with politics or application. On the contrary to the negative opinions about the contribution of DBER, three researchers stated that DBER affected education system positively because thanks to DBER, how to teach the knowledge specific to a discipline was learned, and education policies and programs were designed and redesigned. The following excerpt highlights this contribution:

> *DBER is very important. Education policies are redesigned thanks to DBER. This is so important. Education policies were redesigned. For example, the earlier the foreign language teaching begins, it is better. With the feedback presented by the research; focusing on this-the age of foreign language teaching-in meetings, congresses and symposiums; the foreign language teaching has been begun to be provided at and after 2nd grade. This is important and this has been realized thanks to research." (Participant 3).*

Discussion

This study aimed at getting an idea about researchers' perceptions of research. On this basis, scientific research, pure scientific research, educational research and discipline-based research were tried to be understood. It was found that the Turkish researchers' perceptions of SR focused on the process and the method of doing a research. This finding is parallel with Kiley and Mullins (2005)'s finding. They also found that two thirds of the supervisors defined SR by touching on its technical dimension. Based on the Turkish researchers' perceptions, SR can be defined as "the process of gathering, combining and analyzing data in a scientific discipline and a planned and systematic activity that generates knowledge and new perspectives at the end of this process".

In order to get a deep understanding for SR, the features of a good research were asked to the researchers. The finding that the most stressed characteristics of a good research were valid, reliable, original and objective seem consistent with the SR definition of the researchers as most of the researchers stressed the technical aspect of the research which included some characteristics such as originality, being methodological, objectiveness and well-written. This finding is not parallel with the findings of Kiley and Mullins (2005). They found that most of the researchers believed that a good research should be innovative and should bring new perspective. However, they also found that two thirds of their participants defined the SR as "scholarly process characterized by the rigorous application of systematic methods" (p. 249) which included in the technical aspect of the SR. Thus, they

concluded that the supervisors' SR definition and good research descriptions were not matching. However, a consistency between definitions and good research descriptions were observed in this study.

The types of research which are basic and applied were also asked to the researcher to comprehend their research perceptions. Most of the researchers' description of the basic research seem consistent with what is written in research books. For instance, Johnson and Christensen (2004) define basic research as the research aiming at "generating fundamental knowledge and theoretical understanding about basic human and other natural processes" (p. 9). Most of the researchers participating in this study also stressed theoretical aspect of basic research. For the applied research, the researchers were of the opinion that applied research was something related to practice. It was seen that the scope and content of applied research was not fully understood by the researchers.

Researchers' perceptions of PSR were similar to their basic research perceptions. For researchers, both were theoretical and both of them were done to understand and explain the basic concepts and problems in a discipline. This shows that basic research and PSR bring similar meanings to the researchers' mind. A similar connection was seen between ER and applied research. All researchers regarded ER as applied research, but only two researchers regarded applied research as ER. Thus, on the basis of this finding, it can be commented that for researchers, all ER is applied research but not all applied research is ER. Educational research was seen the research related to education by the participants of this study. This perception was parallel with the other definitions of ER. For example, Biesta (2007) also defined ER as research on and for education. Contrary to common perceptions about ER, the perceptions on DBER differentiated in this study. There were different opinions of researchers about what DBER was. This may be due to fact that DBER is a newer concept than PSR and ER.

While some of these perceptions are consistent with what is written in research books, some are not. The reasons may be their personal experiences or lack of knowledge. In this study, it was not tried to identify the reasons behind the perceptions, so it was not true to comment on these inconsistencies.

Conclusion

In this study, it was tried to identify how the researchers who were actors of doing research understood research. The findings can be summarized as follows:

Scientific research is a systematic process of gathering and analyzing data. Although it has characteristics such as being innovative, bringing solutions to the problems and new perspective, the most important characteristic of it is being a systematic process. A good SR can be done by paying attention to its validity, reliability, usefulness, originality and well-written literature review.

As for the *ER, it is applied research related to education*. ER is seen as the research related to education. More specifically, ER focuses on student achievement and life-long learning activities. ER is directly related to applied research. Although ER can be both basic and applied research, it is closer to applied research than basic research.

Pure scientific research is theoretical research that tries to understand the nature of a discipline and concepts and problems in a discipline. It is important as it increases knowledge in a discipline and it forms the theoretical background.

DBER is somehow related to educational research and pure scientific research. DBER is seen as a combination of PSR and ER. It benefits from these two research fields. The departments that gives discipline based education in universities have courses both on education and content. They also some courses related to teaching the discipline. Thus, the research about teaching a discipline can be named as DBER. Although this research is important especially in teacher education, researchers do not believe it has much contribution to the Turkish education system. When DBER results are considered while forming the education policy, it can really provide benefits for education system.

Limitations

In this study, researchers from only one faculty were included in the study. Moreover, the inter-reliability of coders was not calculated.

Further research

In literature, it is difficult to find studies focusing on researchers' research especially pure scientific, educational and discipline-based research perceptions. Thus, more studies are required to see what research means to the researchers. Being accepted as a discipline later from the others, DBER needs to be explored. Moreover, as there are different variables such as educational background, age and experience in forming perceptions, the study can be re-conducted with different samples. Finally, quantitative studies can be carried out to get a general idea about researchers' perceptions.

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Appendix

Interview Questions

1. In your opinion, what is scientific research?
2. What are the characteristics of a good research?
3. As you know, scientific research can be separated as basic research and applied research. What kind of studies are in the scope of basic research? What kind of studies are in the scope of applied research?
4. What is educational research?
5. What are the characteristics of educational research?
6. What kind of research problems can be given examples of educational research?
7. What do you think about the place of educational research in scientific research?
8. In your opinion, which type of scientific research can be educational research? Basic research or applied research?
9. What comes to your mind, when I say "pure scientific research"?
10. What do you think about the place of pure scientific research in scientific research?
11. In your opinion, what is discipline-based education?
12. In your opinion, what is discipline-based education research?
13. What are the points that you pay attention while doing pure scientific/educational/discipline-based education research?
14. What are the contributions of the DBER to our country education system?

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