Examining the Conceptualization of Instructional Technology in Turkey

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Abstract

Instructional Technology is a field having approximately a century old past. From its initial conceptualization to date, it has been in question in terms of its label, definition, and scope. Parallel to international interest, Turkey has embraced IT as a field of study and practice. This qualitative study aims to investigate the existing conceptions of experts on Instructional Technology in Turkey and reveal the current status of the field from their perspectives in terms of its definition, purpose, scope, and research approaches. The experts were chosen from among Turkish academics having a PhD degree in the field. The results showed that diverse definitions were made with an interchangeable use of the labels "Educational Technology" and "Instructional Technology". The emphasis for the purpose was on "how to" best support/facilitate/enhance/improve instruction and learning in a broad scope. The experts found gaps on the methodological aspects of existing studies. The results showed that there existed a dilemma between the conception of what IT should be and the practical use of what it really is. There were both common concerns with other countries and concerns unique to Turkey. The main challenges were discussed for further analysis.

Keywords: *Instructional technology; Educational technology; Instructional design; Instructional systems design; Conceptualization of instructional technology*

Introduction

Instructional Technology (IT) was recognized as a field in the 20thcentury. The common practice was grounded on a "primordial human drive" for better teaching (Molenda, 2008, p. 4). As it is a relatively young field, the definition, scope, and research approaches of IT have continuously been examined by academics (e.g., in Association for Educational Communications and Technology (AECT) committees (Reiser, 2012), IT Forum listserv debates (Lowental & Wilson 2010), special sessions in conferences etc.). Definitions of the field and its labels have changed over time (Persichitte, 2008; Reiser, 2012; Saettler, 1990; Savenye & Robinson 2004; Simsek, 2005). Shifts in definitions and names for the field have accompanied changes in the conception of the scope of the field as well. These changes affect how external audiences view the field and eventually may confuse its practitioners (Lowenthal & Wilson, 2010).

There are considerable studies having IT in their titles and using IT as equivalent to Information and Communication Technology (ICT) or any media device or tool. Although not equating media with the field has been cautioned worldwide (Simsek, 2005), it is evident that media component of IT is still over emphasized and often regarded as synonymous with the field by many (Latchem, 2014). This is a long lasting and yet unresolved issue.

In a study of the IT perceptions, Simsek (2005) found no significant differences related to aims, scope and problems of IT among academics in six countries with diverse development stages (i.e., underdeveloped, developed, and developing countries). Meifeng, Jinjiao, and Cui (2010) found that IT in China was viewed within advanced-technology oriented cognition and problem-solving oriented cognition. The authors described the focus of the former view as more of a media oriented conceptualization and the latter as more of a systems approach. A similar trend was observed in Taiwan (Tu & Twu, 2002) and Canada (Luppicini, 2008) where learning technology and distance education were attributed as the main components of the field. Chitiyo (2010) found that teacher educators dominantly viewed IT as media, while the educators with IT training had 'narrow systems' view (Schiffman, 1995) in Zimbabwe (i.e. a systems approach but without needs assessment and formative evaluation). There are some commonalities of the conceptions and the practice of IT worldwide, and understanding the conceptions of the field can help improve perceptions of it internationally and contribute to the practitioners with a vibrant lens for the overarching scope of the field.

The field was "invented in the United States" (Romiszowski, 1995, p. 275); but IT research is now conducted across the world, including Europe (Dimitriadis, 2012; Ely, 2008), Australia (Hedberg & McNamara, 2002), South Africa (Czerniewicz & Carr, 2005) and the Asia-Pacific region (Jung & Yoo, 2014). The increased interest in some countries was substantiated with the advocacy of a constant push for technology integration into education (Lily et al., 2016). Similarly, Kozma and Vota (2014) mentioned the increasing investments for ICT integration by developing countries with the hope of a better quality teaching and learning in the competitive global economy. Lying partially in Southeastern Europe and partially in Western Asia, Turkey also has embraced the study and practice of IT. A trend study covering research studies in six major journals between 2000 and 2010 ranked Turkey seventh of countries having the most IT publications (Hsu et al., 2013). A steady increase was observed in publications after 2001 (Kucuk et al., 2013) and Turkey has increasing numbers of graduate and undergraduate programs and initiatives related to IT.

There are limited studies on how the changes in the field are perceived by its researchers. Existing studies are mostly opinion based (e.g. Lowental & Wilson 2010, Reiser & Ely 1997). Also, there are few studies on the conceptualization of IT by researchers and practitioners in developing countries like Turkey. Existing studies mainly focus on methodological research approaches (e.g. Baydas et al., 2015; Kucuk et al., 2013; Masood, 2004) or roles of educational technologists (e.g. Corbeil & Corbeil, 2013; Hodgkinson-Williams & Czerniewicz, 2007). In order to fulfill this gap, this study aims to analyze the conceptions of IT in Turkey using the reflections of selected academics. It is hoped for international readers that the analysis shows how scholars in a developing country having significant investment and academic interest in IT conceptualize the field. The results of the study may also help Turkish academics to rethink the conceptual understanding of IT as a field in the national scope and contribute to the overarching understanding of the field internationally.

Literature Review

IT as a Field

The history of IT shows that the definitions and scope of IT have been influenced by various philosophical, psychological, and scientific orientations (Saettler, 1990) as well as paradigm

shifts (Januszewski, 2008). For this reason, no single definition of IT has been accepted universally (Reiser, 2012). Even the field's name has changed throughout its history. The Association of Educational Communications and Technology (AECT), which is the most influential professional organization for IT academics and practitioners, has used several different labels, such as Visual Instruction, Audiovisual Instruction, Audiovisual Communications, Instructional Technology, and Educational Technology (ET) (Lowental & Wilson, 2010). While initial definitions focused on technological tools and devices, later definitions emphasized instruction. AECT Committee defined IT this way in 1994 (Seels & Richey 1994, p. 1):

> Instructional Technology is the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning.

In 2007, another AECT Committee used the label of Educational Technology (ET) and produced the following definition of ET (p. 1):

> Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources.

The Committee also commented on the place of ET and IT. They noted that the concept of ET was a larger construct than IT, as education is a larger construct than instruction. In practice, however; the two terms are used interchangeably.

Definitions of the field describe its aims and boundaries; explain functions and roles of people in the field, and identify who is in the field and who is not (Reiser & Ely, 1997). A study of educational technologists (Corbeil & Corbeil, 2013) found that their responsibilities go beyond their training and that they assume many roles. The definition and scope of IT (whether it is a field or a science), its role in professional and vocational contexts, and its relationship with other fields are still unsettled. The diverse characteristics and training processes of IT researchers (Lily et al, 2016; Ross and Morrison 1989) and the very nature of the field (Ely, 2008; Luppicini, 2005) are two reasons. Studies show that Information Technology and Instructional Technology are often confused, by members of the Instructional Technology field and by other educators (Saettler, 2004). Also, being an applied field, IT has multiple knowledge domains, which are difficult to conceptually unite within a single, practical definition (Luppicini, 2005). According to Reeves (2000), alternative definitions are reasonable for new, emerging fields.

The methodological trends in IT research are diverse between journals and world regions (Surry et al. 2014). Research methodologies have been questioned by prominent scholars for the past several decades. The major arguments revolve around the nature, rigor, and relevance of methodologies that best suit IT research (Reeves, 2001; Roblyer & Knezek, 2003; Schrum, 2005). Lily et al (2016) argued that the interpretations of research results as well as their methodologies lack rigor. Ross et al. (2010) promoted experimental designs and mixed-methods research, while Bulfin et al. (2014) argued for a shift to large-scale studies and experimental designs. Design research (Reeves et al., 2005), design and development research (Richey & Klein), and design-based research (Reeves, 2000; van den Akker & Kuiper, 2008) have also been suggested as the most suitable research approaches. Characterizing these three under the term 'educational design research', Ormel et al. (2012) described the main features as: "interventionist (undertaken to improve practice); iterative (consisting of multiple cycles of research, intervention development, testing and revision); and collaborative (involving researchers and practitioners, and sometimes other groups)" (p. 969).

According to Hodgkinson-Williams and Czerniewicz (2007), there are four dimensions in the perspectives of the IT field internationally: a 'unity view' that supports consensus on ID knowledge and practice, a 'growing up' view that tries to reach agreement on a common knowledge, a 'fragmented view' that regards the field as amorphous, disjointed with an insufficiently agreed on knowledge, and a 'no field view' that totally disagrees with attempting consensus on the field's definition and scope.

The Background of IT in Turkey

While the programs in the field of IT have been initiated after 1987 for graduate degree and after 1998 for undergraduate degree, the roots of IT as a recognized field in Turkey date back to early 20th century and are associated with major projects by the Ministry of National Education (MNE). The MNE founded several institutions and implemented a number of programs to introduce IT into the Turkish educational system. According to Alkan (1977), the rules and legislation created by various councils and meetings of the MNE emphasized print instructional media in 1920-1940, audiovisual instruction in 1950-1970, and new systems and approaches after 1970. Learning processes were considered afterwards (Akkoyunlu, 2002); and efforts to integrate and use emerging media (such as computers and the Internet), and emerging approaches and methods (such as constructivism, open and distance education, computer aided instruction, and e-learning, etc.) have continued. One of the pioneers of the graduate programs, Cevat Alkan, has taught IT-related courses since 1972 and founded the ET graduate program in Ankara University in 1987 (Teker et al., 2011). Since that time, a number of other graduate programs have been established with titles that include ET, IT, or CEIT. It should be noted that, although ET was initially the focus in the early programs, more recent programs mainly involve IT. Program titles mainly refer to instruction and the programs are placed within faculties of education.

IT in Turkey has followed the western tradition (Akkoyunlu & Orhan, 2001) in the MNE's establishment and implementation of programs for using technology in education, such as the school museum, the Teaching Materials Center, the Centre of Educational Radio, the Correspondence Course Center, distance education programs, open schools, and the Directorate of Educational Technologies (Akkoyunlu, 2002; Alkan, 2011; Ozkul, 2001). Significant investments have been made for Information and Communications Technologies (ICT) integration in grades K-12. The FATİH Project (Movement of Enhancing Opportunities and Improving Technology), for example, is the latest project, which intends to equip 42,000 schools and 570,000 K-12 classes with interactive whiteboard, projection systems, and tablet computers (MEB 2012).

A western orientation is also evident in academic initiatives, such as governmental scholarships supporting Turkish graduate students enrolled in IT programs in the United States and Europe. Students returning to Turkey established IT programs in higher education. Graduate programs in ET, IT, and Computer Education and Instructional Technology (CEIT) are all current examples. The establishment of the CEIT undergraduate program in 1998 as part of the Teacher Training Reform by the Higher Education Council (HEC) was a milestone integrating CEIT graduate and undergraduate programs into teacher training. The CEIT undergraduate programs enable pre-service teachers to teach computer skills in secondary schools, or to become Instructional Technologists in training or education. The undergraduate programs, which are mostly similar

due to the central administration of Turkish universities by the HEC, include computer related courses (e.g., database management, networks, programming) and instructional technology related courses (e.g., instructional design, distance education, project management).

Major international efforts track trends in IT research during the last two decades including technology related issues, learning environments, distance education, and media studies (Hew et al., 2005; Masood, 2004; West & Borup 2014). Similar studies were conducted in Turkey (Gulbahar & Alper, 2009; Kucuk et al., 2013; Simsek et al., 2009). International studies included more publications on instructional design and development, the psychology of learning and instruction, communication strategies, and research and evaluation methodology; while in Turkey, more studies focused on e-learning and multimedia (Gulbahar & Alper, 2009; Hew et al., 2005; Kucuk et al., 2013; Kurt et al., 2009; Simsek et al., 2009; West & Borup, 2014).

Purpose of the Study

This study aims to investigate the existing conceptions of experts on Instructional Technology in Turkey and reveal the current status of the field from their perspectives in terms of its definition, purpose, scope, and research approaches. The following specific questions were investigated to address how the field is conceptualized:

- How do Turkey's IT experts define the field?
- How do the experts describe the purpose and the scope of IT?
- What research topics and methodologies do the experts perceive as necessary in IT research?

Methodology

To investigate how experts conceive IT as a field in terms of its definition, aims, scope, and research topics and methodologies, a descriptive approach was followed. IT conceptions of Turkish experts were examined via qualitative interviews due to flexibility of the research process for an in-depth analysis of the participants' conceptions of the phenomenon under investigation (Bryman, 2008).

The Research Site and Participants

The interviews were conducted to determine how they define the field, describe its scope and aim, and determine its most appropriate research methodologies. The International Conference of the CEIT Symposium (ICITS) in September 2014 was the interview venue because this annual meeting held jointly by several Turkish universities is attended regularly by the country's IT experts. Since all experts could not be able to attend the conference, four experts participated via phone and one expert preferred to write responses to open-ended questions electronically. Experts were chosen from among academics because they are both practitioners in the field at the undergraduate and graduate levels and also researchers.

Experts possessed a PhD degree in IT or ET, held positions in academia, and were currently professionally active. A total of twelve experts from CEIT departments in eight well-established universities participated. The mean experience in academia as of interview date was 13.6 years. Five participants had PhD degrees from US universities, and the rest had doctorates from Turkish universities. Majority had their undergraduate degrees from the field of Curriculum and Instruction and mainly held positions in academia during their graduate education. They all had diverse focuses of research such as teacher education, ICT integration, cognitivist approaches, constructivism, instructional design, human-computer interaction, online learning, technology-enhanced learning, etc. They all teach graduate and undergraduate courses on these topics of interest. Table 1 provides information about the study participants.

Table 1. Information on the Participants in the Study

Expert Code	Gender	BA/BS Degree	Experience in IT (years)	PhD Degree Taken From
A	Male	English Language and Literature	15	University of Cincinnati
B	Male	Curriculum & Instruction	18	Ankara University
C	Male	Curriculum & Instruction	17	University of Southern California
D	Female	Curriculum & Instruction	18	Ankara University
E	Male	Computer Education	6	Anadolu University
F	Female	English Linguistics	20	Anadolu University
G	Female	Science Education	11	Ankara University
H	Male	Curriculum & Instruction	13	University of Ohio
I	Female	Curriculum & Instruction	20	Hacettepe University
J	Male	Computer Education	5	Wayne State University
K	Male	Computer Education	8	Middle East Technical University
L	Male	Mathematics	12	Indiana University

Data Collection

The data were collected via semi-structured interviews. An interview protocol was created by the researcher based on the research questions. Three experts (i.e. having expertise in qualitative interviewing and being within the field of Education for more than 10 years) were consulted on the rigor and trustworthiness of the interview protocol. Several changes were made based on these reviews of the clarity and suitability of the questions. After revising the document according to their recommendations, a pilot interview was conducted with a scholar who is in the field of IT, and the interview protocol was finalized based on the need to make the questions more explicit. The interviews lasted approximately 30 minutes both for face-to-face and phone interviews. There have been several interruptions during the phone interviews due to voice problems, but they were overcome by recalling, and they did not affect the overall interview process.

The questions given below are examples from the interview protocol:

- How do you define IT?
- What do you think about the latest definition of IT by AECT?
- What is your response to the added component of “ethics” in the last definition?
- What do you think is the scope of IT?
- What are the main purposes of IT as a field?
- What are its related disciplines?
- What research topics do you think are necessary for IT research in Turkey?
- What do you think about the methodologies in IT research in Turkey?

Data Analysis

Qualitative content analysis was used to analyze interview data. This method is used to describe and interpret data through systematic coding and classification (Hsieh & Shannon, 2005; Schreier, 2014). Open ended questions were used in the interview with follow-up probes for clarification and elaboration. The interviews were recorded, initially listened to several times, and then transcribed. After going through the interview data, the descriptive codes and notes were added in the margins and significant statements were highlighted relating to the research questions. Finally, the statements were grouped into categories, and synthesized into generalizations under each research question (Creswell, 2008; Schreier, 2014).

Trustworthiness

During data analysis, the transcriptions were re-read while listening to the audio records in order to ensure credibility. After data analysis, member checks were done with two participants on the accuracy of themes and interpretations in writing (Creswell, 2008). Also, to limit the influence of the researcher's perspective, a peer from the same field but outside the study was asked to check the interpretations.

Results

The results are presented in relation to the research questions and as major categories (i.e. definition of IT, the purpose and scope of IT, and the research topics and trends). Themes and sub-themes for each major category are provided under sub-headings.

Definition of IT

The responses of the participants on the definition of IT were grouped into three main themes as prominent expressions, definition constructs, and existing definitions, and summarized in Table 2.

Table 2. Summary of Themes, Sub-themes and Codes for Definition of IT

Themes	Sub-Themes	Codes
Prominent expressions	Nature/domain of IT	Scientific field, application field, system, discipline, science, art, art and science, engineering discipline, not engineering but education discipline
	Label	Same as ET, narrower than ET
Definition constructs	Definition basis	Answering how question, using technology for education, solving educational problems
	Metaphors	Lever, chair, lego, interdisciplinary umbrella
Existing definitions	Deficient	Too technical, ethics unnecessary
	Adequate	Ethics necessary, valid for describing boundaries

The Prominent Expressions

Most of the participants described IT as a "field"; but some called it a "system," "discipline," "science," or a "science and art." One participant emphasized that IT is a field, not a science. Another participant (C) emphasized that IT is a field of practice. Expert H described IT as a discipline. Expert B explained the basic constructs as such:

> I consider the changes of the definitions in the history of IT… There is a technology aspect which we do not like much due to limiting it to hardware, but… it is a field linked with technological resources… When we regard it [the field] as pure science, we narrow the technology perspective… It is an ethical practice and application field.

Several experts stated that ET is a somewhat broader concept, while IT is a subset of ET that is more closely involved with formal and informal learning. Expert G stated that although very much linked to each other, IT has a narrower scope. Others insisted on using the terms interchangeably. One expert (F) noted "*In our grad period, we were taught the two terms as distinctive; but in practice, you see that they mean the same thing*". The participants used the terms IT or ET interchangeably themselves during the interviews.

The participants were also asked whether the field is an engineering discipline. There were contradictory responses to this question. Several rejected the idea immediately as a too technical descriptive term for a field dealing with human beings. Expert G noted that "IT cannot follow a straight line like engineering". Several of the experts suggested the use of "*learning engineering*" as a better alternative. Others proposed the idea that IT is an engineering discipline in terms of its basic methodology for solving problems using scientific knowledge. All of the participants stated that while engineering deals with machines and techniques, IT involves human beings, which distinguishes the field from plain engineering.

Definition Constructs

While defining IT, the participants emphasized "how" to best support and facilitate learning; and how to best "solve educational problems" to facilitate "efficient, effective, and satisfactory learning and teaching". One participant focused on the "use of technology for instruction". Some participants used metaphors to associate IT with legos, bridges, chairs and interdisciplinary umbrellas. Expert L used the metaphor "lever." He stated:

> ... we can think of IT as a lever to facilitate and improve this [learning and teaching] process in a more satisfactory, efficient, and effective way. In this process, IT owns a scientific foundation upon which to use this lever. While it is still in discussion whether IT is a science or craft, it has both dimensions. We have theories, and so IT is a lever that uses these theories and further directs to practice, as stated in the 1994 definition of AECT. It has both scientific and artistic nature. Our aim is to use this lever correctly in the correct place.

Participant H argued that the term "technology" was conceived mainly as hardware and resources by teachers and even by professors. He added that technology has the role of a bridge: "*There is science in one side and application/practice on the other side. Technology works a bridge between them. That is, a mediating discipline that carry the scientific knowledge to practice".*

Existing Definitions

Most of the participants offered definitions for IT that are very close to AECT's definitions from 1994, although some mentioned the 2007 definition as well. Almost all of the participants emphasized that the definition of IT inevitably changes over time. Expert C found AECT definitions too technical and proposed the rationale that the field needed more practical definitions that everyone can understand. He stated, "*This [AECT definition] can be very meaningful for [people] like us [who are] doctoral graduates in IT. However, from an outsider's perspective, such as that of a teacher or another educator, it does not make sense.*"

Regarding the "ethics" component that was added to 2007 definition, Expert F criticized that this addition was a late step taken. Expert A found it necessary and noted, "Use of technology as a tool has brought vendors and their products into educational context. Focusing on these tools is an ethical problem. Continuing to use these tools while being aware of the deficiencies is another ethical problem". Expert K explained that ICT was very much related to IT and ethics has become a rational definition construct since ICT involves "a context open to ethical violations such as plagiarism and cybercrime". However, two experts insisted that ethics is a component that should inherently exist in any field - and therefore, did not need to be added.

The Purpose and Scope of IT

The major themes regarding the purpose of scope of the IT field, as indicated by the participants of the study, are presented in Table 3.

Table 3. Summary of Themes, Sub-Themes and Codes for the Purpose and Scope of IT

Themes	Sub-Themes	Codes
Purpose of IT	Basic function	Effective, efficient and appealing learning, design of learning environments, increasing performance
	Role	Linking all fields, leveraging education
Scope of IT	Boundaries	No clear bounds, life-wide, linked to Curriculum & Instruction, linked to Instructional Design, linked to Psychology, linked to all disciplines
	Turkish perspective	Lack of a common conceptual understanding of the field, limited to hardware use in education, lack of a strong accumulation of IT, lack of local and cultural inclusion
	Focus/Structure	Answer "how" question, contextual, blurred scope, amorphous, based on needs, like legos

When the participants were asked the aims of IT, they mostly mentioned effective and appealing learning. This basic function was supplemented with other or more refined features, such as designing and sustaining such learning environments, and increasing the performances of both learners and teachers. Four participants suggested that IT simply aims to solve learning and teaching problems. "*Determining the paths for learning and teaching*" said one expert. One expert (L) offered a chair analogy:

> [There is] a wooden chair and another chair [which is] more comfortable. Both are chairs. If we want more humanistic approaches, then the learning environment must be designed so. Therefore, [we must] balance more satisfactory learning environments with efficiency, effectiveness, and shorter time with less effort and less cost.

Expert A remarked that the field in Turkey faced a lack of negotiation on mutual concepts. He elucidated his ideas as the following:

> Despite the recent advances in the field are followed, I feel that we have problems in creating a mutually agreement on the conceptual framework for the field. This can be seen as a deficiency in terms of explaining the borders of the field.

For the scope of IT, the participants expressed different orientations. The most accepted idea was that IT focuses on "how" of learning and teaching. Therefore, its scope covers anywhere that learning processes occur. One expert (L) stated that IT covers all life periods and people, and that it encompasses both life-long and life-wide learning. Citing the report of National Education Technology Plan 2010 (US Department of Education, 2010), the expert explained that learning needs to be in human's life not only throughout a life period (life-long) but also in all waking hours of a day (life-wide) in formal and informal environments, and he added that it continued during sleeping hours as well. Two of the participants said that IT covers all formal and informal learning. Another expert (E) noted that the scope is dependent upon the context and problems to be solved in education. He explained:

> ... how individuals learn is a subject for psychology or educational psychology, but it is ours to use this knowledge. How to use this knowledge as a problem-solving tool in certain situations, environments, or contexts is related to our field.

One expert (J) also mentioned context as an important variable, with a focus on "needs." Another expert (I) likened the scope of IT to Legos (the toy blocks). She asserted that IT needs to be a discipline that is composed of little pieces. These pieces should be appropriately linked to the needs of individuals. She elucidated her ideas with this statement:

> IT is not a system that someone creates and presents to others, but is a dynamic system in which individuals themselves plan, create, use, and manage their own learning thanks especially to recently developed technologies.

Several participants noted that, being a broad field, the scope of IT is blurred. One expert (D) associated the scope with chaos theory. She explained it as the following:

> Neither education field nor IT have certain edges or roots; they also do not have certain borderlines as a field of practice. Today you can have IT practices in formal schools or in workplaces. You can also use it diverse contexts, be it Internet environment like mass communication or anywhere else… We are now using formal environments, but you can use IT anywhere related to learning and teaching.

Another participant (B) emphasized that it is about the definition as well. He said, "*Look at all the AECT definitions. There are hints about what IT is, but it is not clear what IT is supposed to do. This is related to scope.*" Yet, Expert C argued that the scope of IT has become very problematic in Turkey. He stated that IT has lost its focus because there has been a big shift to hardware. He said:

> Too much information technology oriented studies have taken place…Why? Because studies in the information technology field or informatics in our country have shifted our focus in the field, due to researchers working in our field but having undergraduate or graduate degrees from other fields… As professors in graduate programs, we cannot agree upon the basic knowledge base of the field… This causes a great loss of the value of the field in our country.

Supporting this argument, Expert B elucidated his ideas as following:

> People define themselves [their research approaches] by identifying with IT. But we know that they do not have IT background. They tend to study with some practical solutions while disregarding theoretical baseline. For example, there is a constructivist research study measuring achievement. You see that a multiple choice test was administered. … You can see such radical conflicts. … Recently, it has become too easy to write an article or proceeding or book. If the field was conceptualized adequately, this would not happen.

Expert F compared the role of IT to an "interdisciplinary umbrella" that links all fields and likened the assembly line of an industrial society or the straw of the agricultural society. Related to the hardware orientation, one participant (B) approached the issue from another angle. He explained the role of science and technology in IT this way:

> There needs to be a learning focus at the center [of IT]. The reason needs to be facilitating, easing, and increasing learning.

Expert G described IT as an ecosystem. She stated, "The teacher and the program need to be very good. More primarily, [governmental] politics and strategies need to be effective. Teacher,

learner, content, evaluation, sustainability are all parts of the ecosystem and they need to all fit".

There was also a remark on the cultural or social appropriateness of the use of IT. Expert D noted that IT originated in the USA, and that we should consider our own conditions. She said:

> Do the applications in the USA match those in our country? No. … I believe our applications, practices, and research studies need to be specific to us. Using all emerging technologies used in the USA or western countries impedes our applications.

The Research Topics and Trends

Participants had diverse ideas about appropriate IT research. The results are grouped into three main themes: existing problems in research approaches, methodological suggestions, and subjects to be studied. These findings are summarized in Table 4.

Table 4. Summary of Themes, Sub-Themes and Codes for the Research Topics and Trends of IT

Theme	Sub-Theme	Codes
Problems in research approaches	Perceived as too much media/tool oriented	Popularity of new media/tools, publication concern/anxiety, innovation effect, neglecting ID and learning theories, lack of theoretical knowledge/background , traditional mentor-student relations, people having backgrounds in hardware-oriented fields, market-vendor relations, lack of collaboration among different universities
	Departmental structure	Bounding to formal schools, undergraduate program structure
	Study and methodology mismatches	Doing studies out of IT scope, weak research studies
Subjects to be Studied	Anything linked to IT	Considering country conditions and needs, based on interests/ needs, based on ID
	Technology integration	Technology integration into K12 education
	Societal transformations	Digital age features
Methodological Suggestions	Experimental studies	Impact studies, application studies
	Model verifications	Cause-effect or design based research
	Longitudinal studies	Long term studies
	Design and development research	Design based research, developmental studies

Problems in Research Approaches

The main problem identified with IT research was that it is overly tool and media oriented. The most common reasons for this problem were the popularity of new media, publication

concerns/anxieties, and the innovation effect (i.e., the attractiveness of new technologies and tools). Other problems include a trend for neglecting Instructional Design (ID) and learning theories, lack of theoretical knowledge among researchers, traditions concerning mentor-student relations (i.e., students following the same methodological research approaches of his/her mentor), people having backgrounds in hardware-oriented fields, and finally, market/vendor relations (i.e., scholars working with vendors for IT projects and the potential risks of conflict of interest) reflected in education. The undergraduate programs were also regarded as problematic for graduate programs of IT. Finally, study and methodology mismatches were said to be main problems in the field. Several quotations exemplify these responses:

> …we limit ourselves to schools, school contexts. This is due to our departmental structure, due to being part of Education faculties. Our target audience is formal education, K12. But in other countries, it is beyond K12. (Expert L)

> We are saying that IT is not limited to technology in terms of hardware. But, you cannot put forward what it really is. We are looking at our research studies and they tell that IT is equal to hardware. Therefore, whether from this field or not, if we could conduct studies with sound methodologies, we can then move to a better state. (Expert B)

> "As educators and researchers we do not know how to use technology effectively. Technology is used just to be used" (Expert G)

> We have the barrier of our undergraduate programs. We are trying to equip students with skills in technology, for example programming skills, database management skills, etc. Therefore, the graduate programs to strengthen the theoretical aspects of the field stay in the shadows of undergraduate traditions. (Expert K)

> … We could not create a cumulative knowledge base in our field. There are lots of publications, but some are in journals related to education, some are not…. We do not have a "we-feeling"… in terms of a mutual disciplinary and scientific perspective. (Expert D)

> The methodologies that we adapt from Education are inadequate. We either do studies dealing with pure learning or how a tool can be used, which are not our real study subjects… We do not build our research efforts on strong conceptualizations. (Expert E)

One expert (F) pointed out that each of the graduate programs in the Turkish universities has a diverse focus. While research in one university centers on pedagogical approaches, another program focuses on emerging technologies. This was both a complaint and a point of praise. She stated:

> Our country has limited sources. We do not need graduate programs in each university. We need to offer programs collaboratively and establish centers of excellence… Currently there are experts from diverse subjects in different universities, but very limited or no cooperation exists among them… In our institutions, we are trying to solve all problems by ourselves… We need to offer joint programs to combine our strengths…

Suggestions about Subjects to be Studied

Educational needs and researcher interests are the main motives to study IT, according to most of the participants. One participant (L) stated that, unlike the natural sciences, researchers can

study anything they want, even the same subjects, since social science can yield different results and implications in time. Therefore, he suggested doing confirmatory studies. Supporting this argument, Expert D suggested the following:

> You can study anything that you link to the field. Contents that we hardly think or link with IT years ago may become a natural subject of study today. Neither science nor application fields is not something that we initially create borders and then fill it. Whatever the dynamics bring [to your context you study them]… I ask my graduate students what they can add to the sextet ['design, development, utilization, management, and evaluation' components of 1994 AECT definition and plus 'ethics' component of 2007 definition]. Can you add anything from your [local] practices within the national context?

Expert I remarked that the nature of IT is very dynamic and can be directed to learners. She stated:

> IT is a system where everyone can manage their own learning. It is not a system that someone teaches and another learn. Instead, individuals can manage, plan and utilize their own learning especially with recent technological developments. When we can create such dynamic structure and let learners learn on their own, then we can succeed. … This leads us to ID, but it is impossible to think IT without ID.

The participants also frequently emphasized the need to ground IT studies upon strong theoretical backgrounds and ID. Technology integration and societal transformations were other subjects that the participants suggested should be studied in the field. Related statements included:

> We need to go back to ID, learn the theoretical background very well and then move on. (Expert J)
>
> … probably due to researchers coming from other fields, there is confusion between technology education and technology-based education. (Expert H)

Suggestions about Methodology

Experimental studies, design and development studies, and cause-effect studies are the main types of methodologies that were suggested by the participants. One expert (C) emphasized conducting longitudinal studies to measure long term outcomes. Another expert (K) pointed out the inadequacies of existing methodologies that hinder conceptualization of the field for researchers. He supported the idea that IT researchers need to develop new methodologies, such as design-based research, which are appropriate given the nature of the field. Here are several exemplary quotations:

> Experimental studies that investigate R&D [research and development] and application practices can be prioritized. (Expert A)
>
> We don't have longitudinal data, and hence do not have significant interpretations. I feel guilty about this as well... If I could study one single subject [while mentoring theses], I could probably be more productive. (Expert C)

Design-based research is very important. Studies that work in certain contexts/places, and that are not about external validity. (Expert E)

We need to switch to models where we move to theory from practice, not vice versa. These need to be real uncontrolled and unplanned practices. That is, we need to change the system to opposite direction. We need to create theories upon systematic observations. (Expert I)

We need to study the models for validity. That is, when and how this model works contextually. (Expert J)

Discussion and Implications

The findings of the study showed several highlights for the place of the field in Turkey. There were both common concerns with other countries and concerns unique to Turkey. The factors related to field's definition, scope, methodological approaches that are same as in the West and unique to Turkey are outlined in Table 5. The concerns are then summarized in the following bulleted list based on the research questions.

Table 5. Factors Related to the Field's Definition, Scope, and Methodology

	Definition	Scope	Methodology
Similar to the West	The need for IT definition transformations over time	• The role of IT centering on "how" of learning/teaching • Over emphasis of media due to the popularity of media studies, strong vendor-university relations, and institutional incentives to get promoted, tenured, or to receive grants	The need to incorporate more longitudinal and design based studies
Unique to Turkey	Centralized nature of education by HEC having the control over changing names and scope of programs	• K12 focus on IT research due to the primary target of CEIT undergraduate programs • Undergraduate computer programs of CEIT departments and faculty having background from other disciplines	• Divergence from ID • Lack of collaboration among IT researchers • Lack of interdisciplinary partnerships

Conceptions About the Definition

- The need for IT definition transformations over time was largely accepted. The participants' emphasis on "how" to support/facilitate/enhance/improve instruction in the definition of IT shows that these experts focus on the design and learning oriented scope and the prescriptive nature of IT. Therefore, the most common definition offered by the participants can be suggested as:

  - IT is a field of study and practice that answers how to best support and facilitate learning, and to solve (real) educational problems to produce efficient, effective, and satisfactory learning.

- The changing nature of the preferred terminology to describe IT or ET, and viewing IT as either a subset of ET or equating their meanings in practice indicates that there is no common agreement on the field's name. Considering the graduate program names mostly being ET or IT, it can be argued that the trends to change the graduate program names in USA (Lowental & Wilson, 2010) have not occurred in Turkey. This can be attributed to the central structuring of higher education in Turkey. The program names are determined by HEC, which impedes changing names for programs in universities. The participants' stress on ID also supports the call of Reiser (2007) and Lowental and Wilson (2010) for using 'design' in the label of the field.

Conceptions about the Purpose and Scope of IT

- The participants suggested many and diverse analogies for the aims and scope of IT, such as chair, Lego, lever, and interdisciplinary umbrella. This indicates the common conception of an assistive role of IT in teaching and learning.
- The role of media is over emphasized as in the case of many countries including Canada (Luppicini, 2005), China (Meifeng et al., 2010) or Taiwan (Tu & Two, 2002). Simsek (2005) found that scholars in six countries including Turkey rejected the idea of equating the field with the use of technological tools in education. The participants of the current study stated similar arguments, but mentioned the dominance of media studies in practice. This indicates a conflict between conceptions of what IT should be and what it really is in practice. A number of causes were described for this situation:
  - *The pressure to conduct media studies*. There is the "strong belief [among researchers] in promoting what they see as the inherent benefits of digital technology" (Selwyn, 2012, p. 214), which is an intuitive conception of technology (Harris & Walling, 2014). Most of the participants of this study argued that the popularity of media and tools compels Turkish researchers to study them. This was a criticism of the practices of IT scholars, and of the latest projects of the MNE in Turkey to promote media studies while neglecting other aspects of IT. This sentiment was also stated by Latchem (2005) concerning publications that favor "'promotional' rather than 'investigative'" studies (p. 665). This was also regarded as a cause for neglecting cultural or national needs of the country in IT studies.
  - *The strong vendor-university relations, and the pressure exerted by vendors concerning "how good a certain tool is" for education within the "wild capitalist system."* Several participants' mention the sponsorships and marketing of educational products of companies in academia. This worldwide issue invites both ethical and philosophical questioning of the field. The AECT's attempt to define the ethical standards of IT as a profession can be regarded as a good step for resolving the issue. However, in the Turkish case, national precautions must be taken, and national policies are needed to embrace the ethical standards. Additionally, a statement of conflict of interest could be made mandatory for

authors to publish studies with such relations as it occurs in many fields such as medicine and engineering.

- *Institutional incentives to get promoted, tenured, or to receive grants*; this is another common problem worldwide (Latchem, 2005). Almost all of the participants in this study claimed that researchers need to publish to get tenured, and it is easier to publish studies about emerging technologies and tools. Considering the newly implemented national grant regulation on academic performance (i.e., promoting researchers financially for increasing research activities) as of 2015, it can be speculated that this factor may become more remarkable in the near future in Turkey.

- There is exclusive focus of IT being K12 oriented. Not focusing on other contexts seems to be an artifact of how education is centrally managed in Turkey and how IT was introduced historically. The departmental structure of the academic studies of IT within schools of education can be shown another major reason. This would indicate a need to widen the scope of the field to non-formal learning, as well as military and training settings. From a different perspective, there is also a need for diverse major and minor programs within IT.

- The establishment of undergraduate programs for training teachers both on computer education and IT seems to have engendered a lower level of academic expectations that has fed the perception of IT as technology. People coming into IT academic programs from other fields with PhDs such as Physics, Mathematics, Chemistry, Biology, Language Teaching, Literature etc was said to be another unique factor. Reinforcing IT as predominantly technology and increasing number of scholars and practitioners of IT who come from other disciplines can also be linked to the CEIT departmental structure, due to the included "computer" component. As Molenda (2008) stated, “each media revolution and each paradigm change brings new people with different backgrounds into the field” (p. 18). In Al Lily et al (2016)’s study, most participants stated that “people from different academic domains, interests and power joining the E&T domain can bring a holistic approach” (p. 7). The Turkish participants both complained about and praised this situation. There are a few experts who view this as a method of adding diversity and enrichment into the field, but many argued that it was a handicap leading to mis-conceptualizations of IT as limited to technology and media, threatening the field’s future.

Conceptions about Research Topics and Methodologies

- The participants found gaps in the methodological aspects of existing studies by Turkish scholars, including their own. The outcomes of these gaps were described as shallow studies and replication deficiencies, and the lack of longitudinal studies were linked to nature of technology changing rapidly (Al Lily et al., 2016). The study participants pointed out the methodological limitations for current research approaches and suggested the use of more of experimental, cause-effect, longitudinal, and design-based research studies. Some recent Turkish studies have been conducted using these methodologies (Kucuk et al., 2013), and study participants suggested increasing these approaches.

- The participants also emphasized the lack of strong theoretical and conceptual approaches grounding IT research. They complained mostly about diverging from Instructional Design (ID), and not considering the needs and real problems of the Turkish context. Studies that investigated Turkish academic trends in IT research (e.g., Gulbahar & Alper, 2009; Kucuk et al., 2013) confirm this divergence, in that very few studies have investigated ID. An interesting revelation from the participants involves the lack of theoretical and background knowledge among scholars, implying a need to revise graduate programs.
- Lack of collaboration among different universities within the country was another main result. Partnerships would strengthen the research efforts for extensive large-scale and long-term studies. It would also be useful for scholars to increase collaboration, and create units or associations in which the scholars direct IT research in Turkey. The diverse focuses of research in various universities can be coordinated and better utilized to enhance and improve research outcomes (Bulfin et al., 2014).
- It is noteworthy that most of the participants criticized conducting research studies on Information Technology, Measurement and Evaluation, and Psychology by IT scholars. The findings indicate that these respondents were uncomfortable with this pursuit in Turkish studies. This reflects a need to revise the existing graduate programs. Also, the existing undergraduate programs in Turkey, which provide vocational training, might have affected this result.

Conclusion

This study showed that the infancy process evolved into a questioning phase during the development of IT as a field in Turkey. It can be suggested that IT conceptions in Turkey fall into the `growing up view` and `fragmented view` (Hodgkinson-Williams & Czerniewicz, 2007) in terms of trying to conceptualize a knowledge base and accepting the amorphous nature of the field. Although Turkey has mainly followed a US perspective in IT graduate education, uncertainties concerning the scope of IT, and its aims and methodologies are much more evident. The departmental structure and the structuring of graduate and undergraduate programs had certain effects on the conceptualization of the field in the country.

The experts believe the field in Turkey has been too heavily influenced by the latest developments of media and tools, threatening the field's future by narrowing its scope. This influence can also be viewed as an opportunity to create interdisciplinary partnerships with fields like Information Systems and Computer Science (Corbeil & Corbeil, 2013), but based on the findings of this study, it is regarded more of a threat due to its potential to downsize its scope. Stronger conceptualization of the field may be enhanced via using stronger conceptual approaches and research methodologies, and policies and revisions regarding undergraduate and graduate programs and initiatives need to take this into account.

The call for linking ID with IT with the basic consideration of the country's real needs and problems is another remark that can be extended to underdeveloped countries or developing countries like Turkey. In addition, the need of a national association or organization of the field is much evident. Hence, creation of national associations/organizations that can provide a venue for the advancement of knowledge base of the field among researchers may be another recommendation drawn from the results of this study. Promoting international interactions and

collaborations among countries via these associations can advance the field both nationwide and worldwide.

There are some limitations to this study. First, philosophical, social, and political arguments are not extensively included in the scope of this study. The study investigated the basic conceptions of IT experts with a focus on definition, purpose, scope, and related methodologies. Other aspects of the field as a profession, and its basic paradigms and orientations were not part of the scope of this study. In addition, the number of expert participants can be considered a limitation because not all of the Turkish experts in the field were included. Future research could enhance the findings of this study by examining the views of experts from other areas (e.g., the MNE, the corporate sphere, the military, and other sectors of IT) to offer a broader overall perspective.

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