COMPETENCY-BASED EDUCATION: THEORY AND PRACTICE

Abstract: This study aimed to reach a pro on Competency-Based Education (CBE) through the opinions of Educational Sciences experts and to review the literature on CBE. In this study, convergent design, one of the mixed methods research, was used, and a semi-structured questionnaire was used to collect data. The sample was selected through convenience sampling and consisted of 28 participants. In the study, the documents related to National and International Qualifications Frameworks, history of CBE, its comparison with traditional education, its implementation, and the challenges of CBE practices are reviewed. The findings revealed that there is a conceptual consensus among the experts on the concepts of skill and learning outcome, but no agreement on the use of "competence," "proficiency," and "qualification." The study showed that the experts adopt the most up-to-date definitions of CBE, but it is often confused with Proficiency-Based Education. The study revealed that CBE focuses on the demonstration of competence when considering students' progress and measures it by formative assessments and that, in CBE, students' learning gaps are eliminated by supporting them at each stage.

Keywords: competency-based education, competency, skill, proficiency, qualification

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INTRODUCTION

Regarding the role and function of knowledge, the goal which Ataturk set in 1926 for teaching and learning is a goal that every educator should pursue. It is true that sometimes we as the country drift away or deviate from the goals Ataturk pointed to in the opening ceremony of the 4th legislative year of the 2nd Term of the Turkish Grand National Assembly. However, the aim of education in Turkey has been not only to turn knowledge into a tool, but also to enable students to develop certain skills. For example, as Bıkmaz (2013) stated, some of the aims of 1924 Elementary Schools Curriculum were to enable students develop inquiry skills through Agriculture and Health courses, observation skills through Geography, and communication skills through Musahabat-ı Ahlâkiye, a course on moral values, and it can be said that the integration of knowledge and skills was promoted through education. Apart from these, education has other functions. According to Moon (2007), education, by its nature, has two functions: it identifies and cultivates the potential abilities of each student, and it produces the manpower which is needed to carry out the maintenance of society and to support its development. While the former is the self-actualization function of education, the latter is the manpower production function. Keeping the balance between these two has been one of the major problems of nations. The amount of manpower lost its importance in the 21st century: improving the abilities and competencies of all individuals and developing further their potential have assumed importance. In other words, two functions of education conjoined by centering around the individual. Developing an individual's abilities and competencies is regarded as the only goal both for the business world and for the individual's self-realization. Unfortunately, nations are still in quest of providing an education pursuing this goal. One of these quests is Competency-based education.

As Gervais (2016) stated, Competency-based education (CBE) is “a synthesis between a liberal arts education and the professional education movement.” Briefly, it is the redesign of the system that has developed over the last two centuries (Everett 2019). Also, this reform has been considered among "innovative approaches and best practices" by the US Department of Education (ED 2011). In addition, increasingly, organizations such as the Carnegie Institute and the United Nations focus primarily on “competency-based learning” in education reform efforts (Sullivan and Downey 2015).

CBE puts forth the theory that the majority of students will achieve competence in the specified content area as long as they are given the opportunity and freedom to progress at their own pace and their learning experiences are structured according to their interests and needs (Priest, Rudenstine and Weisstein 2012; Steele, Lewis, Santibanez, Faxon-Mills, Rudnick, Stecher and Hamilton 2014; Sturgis and Casey 2018). With this theory, CBE challenges the notion that learning takes place at a certain speed and place (Le, Wolfe and Steinberg 2014; Ryan and Cox 2017; Spady 1977). In CBE, all students try to gain the desired level of mastery. For some, this will take a short time, while others will need more time to do so. In addition, some students may have already acquired the knowledge and skills before starting their current education level. They may have achieved these competencies through their previous experiences. However, showing their mastery of these competencies will be sufficient for them to progress in their learning. As can be understood, according to CBE, which is an outcomes-focused approach, time is seen as the variable, while performance as the constant (Stafford 2019).

In the literature, the term competency can be used with standards and learning outcomes, or they can be used interchangeably. Then, what is the difference between standards and competencies? Put simply, the standards are what students learn, while competencies are why they learn (Bramante and Colby 2012). Stating that competencies are widely applicable skills of which students need to achieve mastery in high school and beyond, and that they are more comprehensive than content standards, Sturgis and Casey (2018) distinguished competencies from content-specific standards. CBE is sometimes referred to as skill-based education.

Competencies, however, often represent more than knowledge and skill levels: they require the effective applications of existing knowledge and skills in certain context (Egodawatte 2014). Another example of "substitution" can be seen between learning outcomes and competencies. According to Klein-Collins (2013), competencies mean more than learning outcomes: they can be measured, verified by evidence of student achievement, and applied in different situations. CBE is used in conjunction with such approaches as student-centered learning and personalized learning, is also used interchangeably with the terms of mastery-based education, proficiency-based education, and performance-based education (Le, Wolf and Steinberg 2014; Patrick, Kennedy and Powell 2013). At this point, it is necessary to state that there is no single definition of CBE that scholars have agreed on even though various definitions of CBE have much in common (Kelchen 2015; Gervais 2016; Evans, Landl and Thompson 2021). The absence of agreement on the definition of CBE forms the basis of this study and emphasizes the importance of the study.

PURPOSE AND SIGNIFICANCE OF THE STUDY

With the advances in learning technologies, interest in CBE continues to grow in both K-12 and post-secondary education, but research on CBE lags behind practice (Ryan and Cox 2017). Previous studies have focused on the implementation of CBE and examined the effects of different CBE approaches on student achievement. In addition, factors that hinder and contribute to the implementation of CBE have frequently been examined. However, these studies have failed to accumulate scientific knowledge on CBE and to integrate the relevant literature. Studies carried out also do not provide information about what is known about CBE and how the research on the factors affecting implementation should progress. Morrison (2018, 25) states that CBE and Competency-Based Learning are used interchangeably and this results from "the lack of a common framework and vernacular". Levine and Patrick (2019) think that there is a problem of sameness between the concept and definition of CBE. Evans, Landl and Thompson (2021) thoroughly examine the research on CBE between 2000 and 2019 to integrate the literature. They draw attention to the absence of a common definition and language in the studies examined and state that this causes CBE to be interwoven with concepts such as personalized learning, student-centered learning, proficiency-based education. They mention the difficulties policymakers, researchers, and practitioners experience in identifying research topics and filling knowledge gaps without integrity. They suggest that research should be carried out to thoroughly examine the literature and to reach a conceptual consensus.

The CBE's aim from past to present is to improve the overall quality of education and to eliminate or reduce the learning gaps that have accumulated over the years (Lewis, Steele, Santibañez, Stecher, Hamilton, Faxon-Mills, and Rudnick 2013). Like many educational reform initiatives, CBE aims to reduce inequalities in education systems and achievement gaps among students (Evans, Graham, and Lefebvre 2019), to identify and cultivate the unique intellectual, emotional and physical abilities of all individuals to lead successful lives (Moon 2007). This set of aims is also shared by researchers who are education specialists. However, in order to achieve these goals, it has been seen that it is necessary to understand CBE with a qualitative paradigm, to ensure that it is understood and to provide a conceptual consensus. It is thought that the policies implemented without understanding do not reach the aim.

On the other hand, it is thought that, in Turkey, the elements of CBE are intertwined in concepts such as "skill-based education", "skill-based questions" and "qualifications-based education", there is no common language and there is not enough discussion on it. Considering these, there are two primary aims of this study: to reach a conceptual consensus on Competency-Based Education in the light of the opinions of the experts in Educational Sciences and to compile existing literature on Competency-Based Education by reviewing international literature. To achieve this aim, this study seeks to investigate the following questions:

1) How do experts in Educational Sciences perceive and these concepts of skill, ability, competence, proficiency, qualification, learning outcome, and competency-based education?
2) How do qualifications frameworks and competency-based education relate?
3) How is competency-based education seen in theory and practice?

METHOD

In this study, convergent design, one of the mixed methods research, was used. Convergent design is a mixed methods design in which the researcher collects and analyses qualitative and quantitative data at the same stage of the research process, and then combines these data and makes a single interpretation. There are four major steps in the convergent design. First, qualitative and quantitative data are collected. This data collection is simultaneous and separate. Secondly, the collected data is analyzed separately. In the third step, the results obtained from these analyzes are tried to be combined. In the final step, the two result sets are compared and an overall understanding is sought (Creswell and Plano-Clark 2017). The research was conducted simultaneously and separately as qualitative and quantitative processes in order to reach conceptual consensus on CBE and to examine and compile CBE in line with international literature. The separate results illuminated the different problems of the research, and finally a single goal was achieved.
Convergent design variants may differ from the main design. There are three main variants of convergent design in the literature. These are the parallel-database variant, the data-transformation variant, and the data validation variant. In the questionnaire prepared by the researchers in the data validation variant, both open-ended and closed-ended questions are used and it is aimed to verify the results of the open-ended questions and the results of the closed-ended questions. Qualitative items provide the researcher with new themes and interesting quotes to validate quantitative research findings (Creswell and Plano-Clark 2017). Data validation variant was used in the quantitative part of the study. When it comes to CBE, the concepts of competence, qualification, proficiency, ability, skill, and learning outcome are frequently used in the literature. It is seen that concepts such as competence-based education, skill-based education, and proficiency-based education are used in similar meanings in relation to these concepts. In the questionnaire created to provide consensus in these concepts, multiple choice items and Likert scale items aiming to reach quantitative data and open-ended qualitative questions were used to confirm and support these items.
The scope of this study consists of the opinions of the experts in Educational Science about Competency-Based Education and the curriculum and instruction field in the literature. The implementation of CBE in the fields of medicine and human resources is excluded from the scope of the research.

STUDY GROUP

Convenience sampling, one of the non-random sampling methods, was used to recruit the participants of the study. Yıldırım and Şimşek (2013) state that this sampling method increases the speed and practicality of research is often preferred in cases where researchers are not able to use other sampling methods. The current Covid-19 pandemic has made it difficult to reach participants and to have face-to-face interviews. Convenience sampling method, therefore, was employed in this research. The experts who were expected to participate in the study were selected according to their expertise in the academic database of the Council of Higher Education in Turkey (i.e., YÖK Academic). In total, 120 faculty members from Curriculum and Instruction (CI) and 30 faculty members from Measurement and Evaluation in Education (MEE) were contacted via e-mail and 28 of these faculty members agreed to participate in the study. As a result, the sample consisted of 28 experts, 25 of whom were working in CI and 5 of whom were in MEE. In the study, experts from CI were coded from Pc1 to Pc23, and MEE

experts from Pm1 to Pm5. Demographics of the participants other than their area of expertise were not asked in the questionnaire.

DATA COLLECTION TOOL

The questionnaire used in the study was constructed by the researchers by reviewing the relevant literature. The questionnaire consisted of two sections. In the first section, there were 15 items related to the definitions of ability, qualification, competence, proficiency, skill, and learning outcome found in the literature and used in various studies. Participants were asked to choose one or more of the options available and to decide which of the given definitions would be appropriate to use with which concept. Participants were able to write their own concept suggestions in the open-ended questionnaire item when they believed that the concepts given in the options were not related to the definitions. In the second section of the questionnaire, 10 definitions of CBE found in the literature were presented as an option, and participants were asked to indicate their level of agreement on these definitions. In addition to this, their opinions about CBE were asked through an open-ended question. After this data collection tool was constructed, expert opinion on it was sought, and then, the questionnaire was edited and finalized accordingly.

DATA COLLECTION AND ANALYSIS

"Informed Consent Form", "Ethics Committee Report" and "Online Form of Data Collection Tool" were sent to the official e-mail addresses of 28 experts who accepted to participate in the study. Participants' responses to the questionnaire were accepted through the e-mail addresses of the researchers in the following fifteen days.

Descriptive statistics such as frequencies and percentages, content analysis, and descriptive analysis methods were used in the analysis of the data collection tool, which consisted of two sections. In the first section, the participants marked with which concept the definitions given should be used. In addition to this, they expressed their concept suggestions in the open-ended question through the "other" option. The data obtained from 15 items in this section were analyzed by using descriptive statistics including frequencies and percentages. The answers that the participants wrote in the "other" option were analyzed by using descriptive analysis and verbatim quotations from the participants were reported. In the second section, the participants' level of agreement on the definitions of CBE was described by using percentages and frequencies whereas content analysis and descriptive analysis were used to analyze their views on CBE. However, instead of an inductive approach, a deductive approach to content analysis was implemented in this process since it enables the examination of the concepts that are described clearly and theoretically. According to Yıldırım and Şimşek (2013), descriptive analysis consists of (1) creating a framework for descriptive analysis, (2) processing the data according to the thematic framework, (3) describing the findings, and (4) interpreting the findings. The stages of content analysis are described as (1) coding data, (2) finding themes, (3) organizing codes and themes, and (4) describing and interpreting findings. However, deductive content analysis was carried out in this study through the following stages: (1) identifying themes, (2) organizing codes and themes, (3) coding data, (4) describing and interpreting the findings. Identifying themes also functioned as the necessary framework to begin descriptive analysis.

The question in the section where participants' opinions on CBE were asked included two themes. First, it was about participants' opinions on the definition of CBE, and second, about their use of alternative concepts. The data related to this section were coded and analyzed in line with the themes in the question. Thirteen participants, all of whom were experts in CI, responded to this question. In the scope of the framework developed by content analysis, the opinions of the participants were analyzed through descriptive analysis and presented with verbatim quotations.

A systematic literature review was conducted in order to examine and compile the international literature. Key concepts such as "competence," "qualification," "competency-based education," "proficiency-based education", "qualifications frameworks" were investigated in many databases and the data obtained were analyzed descriptively and compiled. As a result of the literature review, studies carried out in the fields other than educational sciences were not included in the scope of the research.

In order to ensure the reliability of the data, an in-depth literature review was conducted to determine the concepts to be included in the questionnaire. Studies related to CBE were scanned and concepts closely related to this concept were included in the research. The opportunity to add to these concepts was provided to the participants with "other" options. For the survey items, an item pool was created as a result of the literature review and document review of the relevant documents, and the most understandable and most accepted items were selected from this pool. In the data collection tool, in accordance with the research method, quantitative items such as multiple choice items and Likert scale items and open-ended qualitative items were included to confirm and support them. Variation of data sources is one of the measures taken for reliability. Expert opinion was sought in order to ensure the content validity of the questionnaire draft form prepared by the researchers. Opinions of a faculty member who are experts in the field of CBE, Curriculum and Instruction, and Measurement and Evaluation in Education were received online. In line with these views, some items were removed from the questionnaire and certain formal arrangements were made. After the questionnaire was given its final shape, the trial and implementation processes of the questionnaire were carried out simultaneously. After the feedback from 150 faculty members, the final form of the questionnaire was applied to 28 faculty members. In addition to these, direct quotations were included as a result of the descriptive analysis of the qualitative data obtained in the research, and reliability was tried to be ensured by choosing the purposive sampling method.

FINDINGS

The findings obtained from the research are presented in this section according to the order of the research questions. The findings obtained with the data collection tool applied for the purpose of collecting quantitative and qualitative data together are presented as findings for the first research question, the findings obtained as a result of document review, in-depth literature review and compilation, as findings for the second and third research questions.

FINDINGS ON HOW EXPERTS IN EDUCATIONAL SCIENCES PERCEIVE AND DEFINE THESE CONCEPTS OF SKILL, ABILITY, COMPETENCE, PROFICIENCY, QUALIFICATION, LEARNING OUTCOME, AND COMPETENCY-BASED EDUCATION

The definitions of the concepts of competence, qualification, proficiency, ability, skill, and learning outcome in the literature were given to the participants in the data collection tool and they were asked to evaluate the appropriateness of the usage of these definitions. Figure 1 shows the matching percentage of the opinions of the participant with the definitions found in the literature.

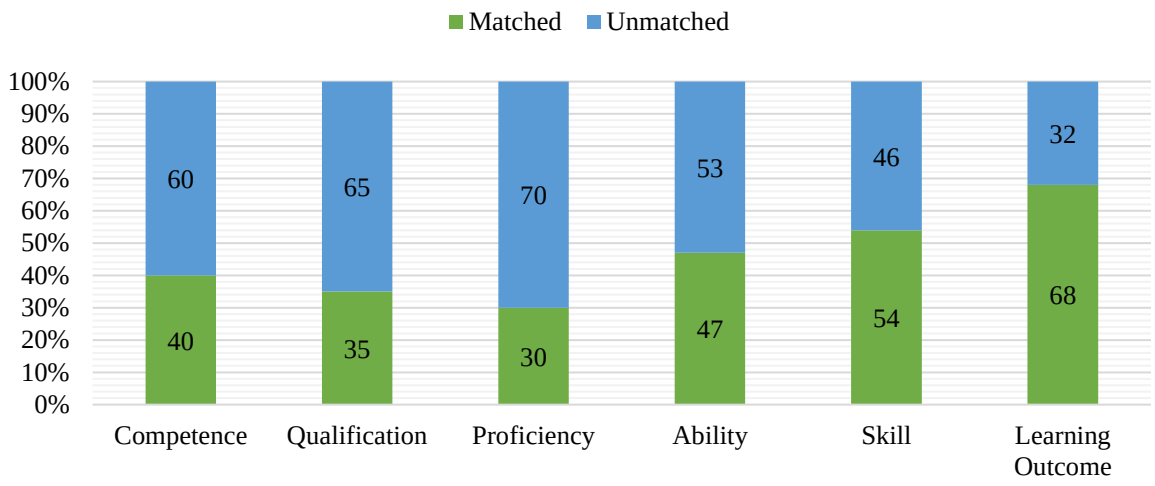

Figure 1. Matching percentage of the participants' opinion s with the definitions in the literature

From Figure 1, it can be seen that the highest matching rate belongs to the concept of learning outcome and the lowest belongs to the concept of proficiency. The statement given in the options for the concept of learning outcome is the definition of the concept "learning outcome" in the European Qualifications Framework. Learning outcomes are defined in the Framework as "[the] statements regarding what a learner knows, understands and is able to do on completion of a learning process" (EU 2017, 20). This finding indicates that the definition of the concept "learning outcome" is adopted at a higher rate. The fact that the expression "learning outcome" has been frequently used in the educational programs and curriculum in Turkey since 2005 supports this finding. Also, the concepts of skill and ability have been frequently used with the constructivist approach to education that focuses on the individual, contributing to the adoption of the concepts.

However, it can be observed that the matching rate is quite low for the concepts of competence, qualification, and proficiency that began to be used frequently in education through the Turkish Qualifications Framework (TQF) (2015) which was prepared within the scope of the accession process of Turkey to the European Union and written in parallel with the European Qualifications Framework (EQF). The relevant findings are presented in Table 1 below for a deeper understanding of the results.

It can be seen from Table 1 above that there is no consensus among the participants on the concepts of competence, qualification, and proficiency. Those who matched the definitions of competence with the concept of competence constitute 40% of the participants, while the remaining thought that they were the definition of the concept of qualification (21%), proficiency (18%), ability (11%) and skill (8%). A similar situation exists with regard to the definitions of the concept of proficiency. While 30% of the participants thought that the definitions of proficiency found in the literature were related to the concept of proficiency, there is a significant number of participants who linked them especially with the concepts of competence (16%) and qualification (21%). The most striking aspect of the findings is in the responses given to the concept of qualification. The percentage of the participants who associated the definitions of qualification found in the literature with the concept of qualification is 35% whereas the percentage of those who matched them with the concept of proficiency is 37%, which is a higher percentage than that belongs to the concept of qualification. The next concept matched with the definitions of proficiency is the concept of competence (16%). Closer inspection of the results showed that one of the definitions of qualification that was considered to be the definition of proficiency is defined in the TQF as "the official document obtained when the responsible body, at the end of a process of

assessment and validation, recognizes that an individual has accomplished the learning outcomes according to certain criteria" (MYK 2015, 4). The number of the participants who matched this definition with the concept of proficiency is higher than that of the participants who associated it with the concept of qualification.

Table 1. Percentages of Faculty Members' Agreement on The Concepts and Suggestions

%	Competence	Qualification	Proficiency	Ability	Skill	Learning Outcome
Competence	40	16	16	12	12	3
Qualification	21	35	21	4	9	7
Proficiency	18	37	30	9	7	7
Ability	11	1	5	47	9	3
Skill	8	1	6	20	54	11
Learning Outcome	1	0	20	7	2	68
Others*	1	10	2	1	7	0
Total	100	100	100	100	100	100
Diploma-Certificate **		*5*				
**Habit*					*2*	
**Reflex*					*2*	
**Academic Progress*				*1*		
**No Response*	*1*	*5*	*2*		*1*	

The participants were asked to choose the "Other" option and add their own concept suggestions in the open-ended question box when they thought that the definitions given in the items were not related to the concepts in the options. The responses written in this open-ended part mostly consist of the concepts of qualification (10%) and skill (7%). The participants Pc1, Pc3, Pc9, and Pc4 suggested the concept of "diploma-certificate" for an item including the definition of the concept "qualification". Although the definition given in that item explains the concept of qualification, it does not include the words "diploma" or "certificate;" therefore, the participants must have felt the need to make such corrections. The alternative concepts suggested by the participants for the definition of skill are reflex (Pc2) and habit (Pc11).

In addition to the opinions of the participants about the concepts separately, the participants were asked to share their opinions on the definitions of Competency-Based Education which is related to all of these concepts in some way and Figure 2 below shows the percentage of the agreement of the participants on the definitions of Competency-Based Education found in the literature. While coding, the definitions of CBE were assigned numbers in accordance with the order of items in the questionnaire, but they were presented in the Figure in chronological order. Therefore, Definition 9 and Definition 2 reflect the definition and understanding of CBE in 1970-2000, Definition 2 and 5 in 2000-2010, and the rest of the definitions from 2010 to the present day.

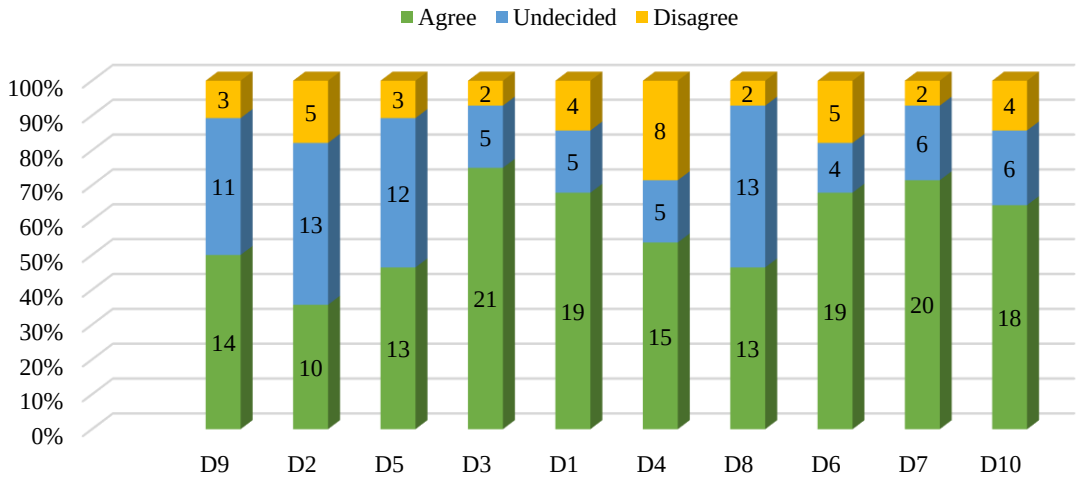

Figure 2. Percentages of faculty members' agreement on the definitions of Competency-Based Education

As can be seen from Figure 2, it can be said that the agreement rate of the participants in Definition 9 by Houston (1974) and Definition 2 by Spady (1977) is relatively low. As stated by Houston (1974, 9);

> "*competency-based programs (a) instruction is individualized and personalized, (b) the learning experience of the individual is guided by feedback, (c) the program as a whole is systemic, (d) the emphasis is on the exit, not on entrance, requirements, (d) instruction is modularized, (e) the student is held accountable for performance, completing the preparation program when, and only when, he demonstrates the competencies that have been identified as requisite for a particular professional role."*

On the other hand, Spady (1977, 22) defined CBE as *"data-based, adaptive, performance-oriented set of integrated processes that facilitate, measure, record and certify within the context of flexible time parameters the demonstration of known, explicitly stated, and agreed upon learning outcomes that reflect successful functioning in life role."* As can be understood from the definitions of Houston (1974) and of Spady (1977), the concept of CBE in the 1970s is more focused on accountability and evaluation. Stating learning outcomes as behaviors and demonstrating them are among the primary tasks. Therefore, it seems possible that the changes in the understanding of CBE from the 1970s to today might be the reason why the participants' agreement rate on these definitions is low whereas their disagreement rate on them is high.

With the development of technology, a change in the definitions of CBE in the 2000s can be observed. Definition 5 (D5) in the questionnaire presented DeLorenzo's definition of CBE. DeLorenzo (2009) defines competency-based education as a standards-based, student-centered, individualized and data-driven learning environment. DeLorenzo (2009) also describes CBE as a system where learning is constant, and time is variable. Albanese, Mejicano, Anderson and Gruppen (2010) states that CBE is more concerned with what students should do with what they learn than what they should learn, and their definition of CBE was given in Definition 3 (D3) in the questionnaire. This is the definition on which the participants agreed most (n=21). When examined thoroughly, it can be understood that this definition is more concerned with practice than abstract concepts and the emphasis that the definition of Albanese et al. place on practice might be the reason why the percentage of the participants' agreement on this definition is high.

In the 2010s, Le, et al. (2014) expresses that CBE is essentially a teaching and learning approach in which competencies that the students need for academic, professional, and civic success are described with measurable learning objectives, and in which students progress to the next level

by mastering what is described in the content, and this was the definition given in Definition 1 (D1) in the questionnaire. As can be understood from the definition, competencies are associated with lifelong learning. While the percentage of the participants' agreement on this definition is 68%, the percentage of the participants' agreement on Definition 4 (D4) and Definition 8 (D8), which were written around the same time, decreases. The common feature of these two definitions is that they both reduce CBE to course-related documents. Therefore, it is possible to conclude that the participants thought that CBE corresponds to something more than these definitions. As presented in Definition 6 (D6), Sturgis and Casey (2018) define CBE as a system designed to ensure that all students gain academic knowledge, achieve competence to apply to real-world problems, and develop life-long learning skills for future success, and to provide equality in student achievement. Similarly, in Definition 7 (D7), Rezgui and Mhiri (2018) describe the learning objectives of CBE with specific and measurable explanations of the knowledge, skills, and attitudes expected to be shown after the learning process is completed. They also state that this approach focuses on the ability of students to use and effectively mobilize what they have learned throughout their lives in new and complex situations. Finally, Definition 10 (D10) in the questionnaire included the definition offered by Competency Works in 2019 after a participatory process. As stated in Levine and Patrick (2019, 3), Competency Works describes all the features of CBE as follows:

> *(a) Students are empowered daily to make important decisions about their learning experiences, how they will create and apply knowledge, and how they will demonstrate their learning. (b) Assessment is a meaningful, positive, and empowering learning experience for students that yields timely, relevant, and actionable evidence. (c) Students receive timely, differentiated support based on their individual learning needs. (d) Students progress based on evidence of mastery, not seat time. (e) Students learn actively using different pathways and varied pacing. (f) Strategies to ensure equity for all students are embedded in the culture, structure, and pedagogy of schools and education systems. (g) Rigorous, common expectations for learning (knowledge, skills, and dispositions) are explicit, transparent, measurable, and transferable.*

D6, D7, and D10 which were similar in meaning were considered as close to each other with higher agreement rates. In parallel with the literature, these results suggest that a conceptual consensus might have been reached on these definitions. To examine closely how this consensus differs according to the participants' fields of expertise, the distribution of the participants' responses to CBE definitions according to their field of expertise, namely Curriculum and Instruction (CI) and Measurement and Evaluation in Education (MEE), are presented in Table 2.

Table 2. Distribution of Responses to CBE Definitions According to Participants' Fields of Expertise.

	CI						MEE					
	Agreed		Undecided		Disagreed		Agreed		Undecided		Disagreed	
	n	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***	**n**	***%***
Definition 9 (D_9)	13	56	8	*35*	2	*9*	1	*20*	3	*60*	1	*20*
Definition 2 (D_2)	9	39	11	*48*	3	*13*	1	*20*	2	*40*	2	*40*
Definition 5 (D_5)	10	43	11	*48*	2	*9*	3	*60*	1	*20*	1	*20*
Definition 3 (D_3)	17	74	4	*17*	2	*9*	4	*80*	1	*20*		
Definition 1 (D_1)	15	65	5	*21*	3	*13*	4	*80*			1	*20*
Definition 4 (D_4)	13	57	3	*13*	7	*30*	2	*40*	2	*40*	1	*20*
Definition 8 (D_8)	12	52	9	*39*	2	*9*	1	*20*	4	*80*		
Definition 6 (D_6)	15	65	4	*17*	4	*17*	4	*80*			1	*20*
Definition 7 (D_7)	15	65	6	*26*	2	*9*	5	*100*				
Definition 10 (D_{10})	14	*61*	6	*26*	3	*13*	4	*80*			1	*20*

As can be seen from Table 2, there is a parallelism between the opinions of the participants from Curriculum and Instruction (CI) and from Measurement and Evaluation in Education (MEE) on several definitions. The closest rates are seen in Definition 3 (D3). While the agreement rate of the participants from CI on this definition is 74%, the participants from MEE agree with this definition at a rate of 80%. On the other hand, there is a difference in the opinions of the participants from both fields with regard to Definition 8 (D8) and Definition 9 (D9). The responses given to these two definitions show that the number of the participants from CI who "agree" with the definitions is higher than the number of those who are "undecided" whereas it is the opposite in the responses of the participants from MEE. In both items, the number of the participants from MEE who are "undecided" about the definitions is higher. When (D8) and (D9) are examined together, it can be understood that the idea that the emphasis in education is not on the inputs or the learning processes, but on the outcomes prevails in both definitions. It can be concluded that the participants from CI agree with this idea more than the participants from MEE do.

After determining the orientation of CBE to teaching and learning by reviewing the definition statements given to the participants in the questionnaire, the opinions, ideas, and definitions about CBE were analyzed and the results of this analysis are presented in Table 3.

Table 3. Participants' Opinions on The Definition of Competency-Based Education.

Themes	Frequency (f)
Being outcome-oriented	5
Enabling knowledge, skill, and attitude acquisition	5
Enabling competence development	3
Being individual-oriented	3
Including process evaluations	3
Including flexible learning experiences	2
Requiring group work	1

The participants who expressed their opinions about CBE consider it an outcome-oriented education (n = 5). The faculty members from the field of Curriculum and Education (CI) stated that the outcome is of the utmost importance in education and the skills and behavior expected to be seen in the individual at the end of the education are determined before the education process begins. Regarding this, two faculty members commented:

"The most important feature of this educational approach is that it is outcome-oriented, that is, what is important in learning is performing the target [skill/behavior], not acquiring the knowledge..." (Pc21)

“Competency-based education is an educational process in which the patterns of behavior including knowledge, skills, and attitudes that are expected to be seen in individuals are determined tangibly before the education process begins and special [individualized] but flexible experiences are offered for the acquisition of these behaviors." (Pc16)

The findings indicate that, according to the participants, individuals acquire the target knowledge, skills, and attitudes through Competency-Based Education (n = 5). As one of the faculty members from CI put it in his/her own definition of CBE:

“The purpose of Competency-Based Education is to ensure that individuals can fulfill their responsibilities, roles or duties related to a certain area more efficiently by increasing/improving their performances. Competency-Based Education can be defined as providing education for the purpose of enabling individuals to acquire the necessary knowledge, attitudes, and skills so that they can achieve competence." (Pc23)

According to the participants, CBE is an individual-oriented education (n = 3). With regard to this, the participants stated that learning objectives should be determined by taking account of the individual characteristics, or individual learning needs, of learners. The comment below illustrates this view:

“Competency-Based Education is a process that aims to educate individuals within the scope of the twenty-first-century skills in accordance with the desired and expected qualifications and that enables individuals to achieve the [learning] objectives determined according to their own characteristics or gain the qualifications..." (Pc22)

According to the faculty members from Curriculum and Instruction, CBE is an educational process that requires working with a group (n = 1), is supported by process evaluations (n = 3) and has flexible learning experiences (n = 2). The CBE definition below written by one of the participants summarizes these themes:

"I think Competency-Based Education is a process that is supported by process evaluations as well as outcomes and that requires working with a group as well as progressing individually ..." (Pc8)

Based on the literature, Table 4 below presents the findings obtained from the participants' responses to the questions about determining the concepts that the faculty members use instead of CBE.

Table 4. Concepts The Participants Use As an Alternative to Competency-Based Education.

Themes	Frequency (f)
Qualifications-based education	6
Standards-based education	1
Proficiency-based education	1
Competency-based education instead of proficiency-based	1
Skills and literacy	1

As can be seen in Table 4, the most frequently mentioned concept that can be used instead of Competency-Based Education is Qualifications-Based Education (n = 6). All of the participants who expressed their opinions are experts in Curriculum and Instruction, and all except for one participant stated that Qualifications-Based Education can be used as an alternative to CBE. As three of the participants put it:

“… Standards-Based Education and Skills-Based Education cannot be a good alternative to Competency-Based Education, but I can mostly use Qualifications-Based Education as a satisfactory alternative.” (Pc16)

"… Qualifications-Based Education can be used as an alternative." (Pc22)

"I think that the expression Qualifications-Based Education can be used instead of Competency-Based Education." (Pc3)

In parallel with the literature, the participants stated that more than one different concept can be used instead of CBE, and these are the concepts of proficiency-based education, standards-based education, skills, and literacy. One participant, on the other hand, expressed that it would be more appropriate to use “proficiency-based education” as “competency-based education”.

“…I think it is more appropriate to use ‘competency-based’ instead of ‘proficiency-based.’” (Pc1)

“… the word ‘competency’ in English is close to ‘proficiency’ [when translated into Turkish]. It means performing a behavior/task in the way and level aimed at. Therefore, it would be better and more appropriate to call ‘competency-based education’ by ‘proficiency-based education.’” (Pc21)

"… I believe that the aspect [of CBE] that focuses on the outcome-oriented evaluation and individual progress is called standards-based education." (Pc8)

“… I am not using an alternative concept. However, in the same context, I generally use the concepts of skills (creative [or] critical thinking) or literacy (scientific, mathematical, reading, [or] digital) in current educational programs." (Pc15)

On the other hand, one of the participants who is an expert in Curriculum and Instruction stated that he/she does not interchangeably use the concepts of competency-based education, skills-

based education standards-based education, and qualifications-based education and provided a definition for each concept:

"… Competency-based education can be defined as providing education through which individuals can gain the necessary knowledge, attitude, and skills so that they can acquire competence… In standards-based education, [individuals] are expected to reach the pre-set standards. While the standards of the program are being set, acquiring certain competencies comes before gaining competence… In skills-based education, the aim is to enable individuals to acquire the skills necessary to perform a job or task. Skills-based education is one of the sub-dimensions of competency-based education... When it comes to qualifications-based education, it can be said that it to some extend includes skills-based education, standards-based education, or competency-based education because it is about identifying whether learning takes place according to certain standards set beforehand to obtain a qualification. However, the concept of qualifications-based education is a suitable concept for higher-level education received to continue specializing in a subject." (Pc23)

FINDINGS ON HOW QUALIFICATIONS FRAMEWORKS AND COMPETENCY-BASED EDUCATION RELATE

In order to examine this relationship in the literature, first, the curriculum currently being used in schools were examined in terms of competencies. Then, in the light of these, CBE's relation to national and international qualifications frameworks was established.

A GENERAL OVERVIEW OF CURRICULUM IN TURKEY

Curriculum serves as a means of achieving national goals of Turkish education system. The curriculum, in written form, is a guide to teachers. It fulfills this function not only by containing learning outcomes and units, but also by incorporating explanations related to with which objectives and approaches the teaching should be carried out. The curriculum, prepared by the Ministry of National Education Board of Education, includes curriculum objectives, its perspective, individual development, and approaches to measurement and evaluation. In addition, the points and instructions that should be considered while implementing the curriculum are included. Therefore, such descriptive information included in the curriculum can provide insights into the intended teaching.

The main purpose of the Turkish National Education system is to raise individuals with knowledge, skills and behaviors coalesced around national values and competencies. While the curriculum strives to teach knowledge, skills and behaviors, competencies function as the link that provides the integrity of the knowledge, skills, and behaviors (MEB 2018). Competencies represent more than knowledge and skills do. They explain the effective application of students' existing knowledge and skills in a certain context (Egodawatte 2014).

Knowledge, skills, and competence included in the curriculum are expanded on the National Qualifications Framework of the countries. Qualification frameworks are among the strategic documents on which the curriculum is based. A range of competencies that students would need in their academic, social, and personal lives in both national and international context are included in the Turkish Qualifications Framework (TQF) (MEB 2018). Understandings and definitions regarding competencies vary from country to country. Therefore, studying the national and international qualifications frameworks will be enlightening about what the competencies are.

QUALIFICATIONS FRAMEWORKS

Various qualifications frameworks have been developed to provide information about what students who graduate from different education levels know and can do. Like CBE, qualifications frameworks are not a new concept either. When examining the literature, it can be seen that qualifications frameworks have been used at national, institutional and program levels for more than 25 years (Steele et al. 2014). When talking about CBE, it is understood

that a qualifications framework forms the basis of the curriculum. Competencies consist of a set of knowledge, skills and attitudes integrated together. When an education based on competencies is targeted at, CBE utilizes qualifications frameworks as a road map. Briefly, qualifications have become part of the planning and development processes of curriculum and teaching (Mulder and Winterton 2017).

Qualifications are documents in the form of a certificate or diploma which are issued by an official and authorized institution as a result of the verification and evaluation processes. They certify that individuals have achieved the learning outcomes according to criteria specified in a qualifications framework (MYK 2018). Qualifications frameworks can be prepared at national and international level. The most well-known of these at the international level is the European Qualifications Framework (EQF).

The European Qualifications Framework is an example of qualifications frameworks being institutionalized. Pursuant to the Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning, a reference framework consisting of eight reference levels on qualifications has been developed. The reference levels stated in the framework are described in terms of learning outcomes with progressive levels of mastery. The aim of the EQF is to promote the comparability, transparency, and portability of qualifications that individuals possess. Thus, the EQF functions as a translation device between different qualification systems and their levels (MYK 2018). The European Qualifications Framework describes eight levels which apply to different education levels from primary education to master's and doctorate degrees and serves as a reference framework for these education levels across the EU. In addition, all the qualifications frameworks within the European Union must consider the qualification levels defined in the EQF when organizing their education (Mulder and Winterton 2017).

National qualifications frameworks show variation in parallel with the diversity in education systems. This diversity occurs even if they have the same reference framework. For example, the National Qualifications Frameworks of Germany, France, and the UK in the European Union differ from each other. German Qualifications Framework describes two main categories and four sub-categories: professional competence is related to knowledge and skills, while and personal competence is about social competence and autonomy. Looking at the example of France, we can see that it is a national certification framework, not a national qualification framework, and this framework is more about the labor market rather than education or knowledge. On the other hand, the UK is using its own way of creating its own national framework. The framework here has a plural concept or structure: the Qualifications and Credit Framework (QCF) for England and Northern Ireland, the Credit and Scottish Credit and Qualifications Framework (SCQF), and Qualifications Framework for Wales (CQFW) constitute the national qualifications frameworks in the UK. As can be seen, the framework in the UK includes the concept of "credit", as well. QCF, for example, include the following headings: summary, autonomy and accountability, application and action, and knowledge and understanding. The term "competence" is not used among the descriptors of competencies in the frameworks in the UK, which is intriguing, and probably this is a reflection of skills development agenda in the UK (Mulder and Winterton 2017). Creating a national qualifications framework and aligning it with reference frameworks must be a difficult process; however, according to the research carried out by the European Center for the Development of Vocational Education and Development (CEDEFOP), 28 EU Member States and Albania, Bosnia and Herzegovina, Republic of Macedonia, Iceland, Kosovo, Liechtenstein, Montenegro, Norway, Serbia, Switzerland and Turkey have established their national qualifications frameworks (CEDEFOP 2017).

The Turkish Qualifications Framework (TQF) is a national qualifications framework which is created on the basis of the European Qualifications Framework. The TQF is a national

qualifications framework providing all the descriptors of competence gained through vocational, general and academic education and training programs including primary, secondary and higher education, and through other learning paths. The TQF will create a higher added value, especially due to qualified labor force, provide more employment opportunities for individuals, present quality references for the institutions providing education and training, and enable individuals to have a better access to different means of learning. The necessity of referencing qualifications is related to the concept of competence. According to the TQF Regulation, the term "qualification" refers to "the official document obtained when the responsible body, at the end of a process of assessment and validation, recognizes that an individual has accomplished the learning outcomes according to certain criteria." The term "qualification" in the TQF is defined in a way that it would be compatible with its definition of "qualification" in the EQF because one of the most important steps in TQF development process is to prove the referencing to and alignment with the EQF (MYK 2015).

Learning outcomes approach has a key role in the development of the EQF and the TQF. Learning outcomes are defined as the knowledge, skills and competence that an individual has after a learning process is over. Therefore, the level descriptors in the EQF and the TQF are structured around these three components stated in the learning outcomes. In these two frameworks, each of the 8 level descriptors is defined in terms of these three components. Although there are many definitions of knowledge, skills and competence in the literature, it is useful to state the definitions within the scope of the TQF. The TQF defined knowledge as "theoretical and/or factual knowledge involving the comprehension of facts, principles, theories and practices related to an area of work or learning", skill as "utilization of knowledge and problem solving which requires the ability to use logical, intuitive and creative thinking and dexterity, method, material, tools and instruments acquired in an area of work or learning," and competence as "utilization of knowledge and skills in an area of work or learning by taking responsibility and/or displaying autonomy, determination and satisfaction of learning requirements; taking into consideration the social and moral issues and responsibilities" (MYK 2015, 22). In parallel with this definition, Egodawatte (2014) explained competence as the effective use of knowledge and skills in specific and complex situations.

In the TQF, qualifications are split into eight levels, from pre-school participation certificate to doctoral diploma. Some of these documents are issued by the Ministry of National Education. In addition, eight vocational qualification certificates are issued by the Vocational Qualifications Authority. Qualifications set for each level are included in the TQF by receiving quality assurance. The qualifications included in the TQF are stored in the Qualifications Database.

Qualifications for Lifelong Learning is an essential element of both European Qualifications Framework and Turkish Qualifications Framework. Lifelong learning comprises competencies developed on the basis of skills. These skills are also called higher order learning skills, the 21st century skills, and transferable skills. Critical thinking, creativity, collaboration, problem solving, and reasoning skills are examples of these skills. Lifelong learning skills enable students to be become successful, adaptable, independent, self-directed individuals throughout their lives (Casey 2018). Eight different key competencies are defined within the scope of the TQF for Lifelong Learning. These are as follows-communication in mother tongue, communication in foreign languages, mathematical competence and key competencies in science/technology, digital competence, learning to learn, social and civic competence, sense of initiative and entrepreneurship, and cultural awareness and expression. Each key competence is described as a complement of knowledge and skills (MYK, 2015). These key competencies are included in the curriculum prepared by the Board of Education and are used in conjunction with values while constructing the learning outcomes. To summarize, individuals receive qualifications in the form of documents after completing general or vocational education. These

qualifications are determined according to their success in relevant learning outcomes. Learning outcomes, on the other hand, consist of competence which is a complement of knowledge and skills. Thus, education should include knowledge, skills, competence, and learning outcomes, and all if its aim is to enable individuals to receive qualifications. Competency-based education is regarded as one of such education.

FINDINGS ON HOW COMPETENCY-BASED EDUCATION IS SEEN IN THEORY AND PRACTICE

With regard to this research question, the historical development of Competency-Based Education, its comparison with traditional education, its implementation, and the challenges of CBE practices and their possible causes are examined.

HISTORICAL DEVELOPMENT

Competency-based education is as old as education itself (Mulder and Winterton 2017). Although it emerged in the 1960s, its origins date back to the 1910s. Prior to the emergence of the concept, John Dewey's theory of progressive education, Taylor's Scientific Management approach, and behaviorism theory have laid the theoretical foundations for CBE. Mulder and Winterton (2017) stated that the educational philosophy of the CBE movement dates back to John Dewey. Dewey's understanding of progressive education emphasizes a student-centered education approach driven by experience and discovery rather than lesson and memorization (Meier 1995). Instead of the deductive approach that emphasizes the application of methods and principles, John Dewey called for empowering students to inductively build their own learning through real life participation. Dewey's understanding of education was influenced by the conditions of the period and at certain points it evolved into vocational education. In about the same years, Charles Prosser emphasized the need for better and more comprehensive vocational education as a result of the post-World War I and the Industrial Revolution. Taylor's (1911) behavior-oriented approach to enhancing performance also serves as the foundation of CBE. Principles in Taylor's Scientific Management approach were applied to separate, arrange and facilitate teaching in classrooms. Competency standards were applied to students and effective teaching was determined according to these standards in teacher preparation programs (Curry and Docherty 2017). At the same time, efficient, effective and standardized educational practices were needed for social efficiency and essentialism (Schilling and Koetting 2010). Finally, behaviorism theory has profoundly affected the concept and practices of competency-based education and training. Behavioral theory was a strong influence over the development of CBE, emphasizing the expression of competencies in behavioral terms and the evaluation of observable behaviors. However, despite both advantages and disadvantages, behaviorism provided a solid theoretical foundation background for the CBE (Hodge 2007).

The first-wave CBE movement took place between the 1960s and the 1980s. Competency-based education was brought to the fore in the United States in the 1960s in response to international issues related to competition, including the space race after the successful launch of Sputnik. In addition, the dissatisfaction of the public with the schools and the thought that the teachers are inadequate in the society brought the need for reform. Rosner and Kay (1974) also claimed that the CBE derives from accountable, relevant and cost-effective education at school. Many educators have seen the CBE approach as a means of meeting the demand for accountability at schools (Mulder and Winterton 2017). As a result, towards the end of the 1960s, the U.S. Department of Education formalized the CBE as a direct measure of learning (Tuxworth 2005). The first-wave CBE movement which took place in the 1960s-1980s hinged on the concept of "mastery learning" by Benjamin Bloom (Evans et al. 2019; Mulder and Winterton 2017; Steele et al. 2014). Bloom is a leading figure in the competency-based movement. Based on his research with students in Chicago, Bloom (1976) argued that performance gaps among low-achieving, high-achieving and naturally-gifted students would close and almost all students would achieve mastery of the content as a result of adapting the

education to students' individual skills and learning rates (Steele et al. 2014). The first-wave CBE movement included three reform movements: mastery learning, competency-based education and outcome-based education. These reforms actually indicate a chronological order. Basically, they all share common principles. Mastery learning evolved into CBE in the course of time since both reform movements shared a similar philosophy in terms of the objectives and skills aimed at supporting students' individual learning needs. In addition, they both emphasized that students should not progress without mastery (Spady 1977). In the late 1970s and early 1980s, the competency movement was renamed outcome-based education, mainly because educators believed that focusing on "minimal competence" would urge teachers to base their curriculum on lower-order thinking skills and processes (Guskey 1994). Basically, Outcome-Based Education is a form of education in which learning outcomes are specified in advance and the education continues recursively until the students achieve these outcomes. The popularity of the first-wave movement eventually started to fade due to several reasons, including lack of conceptual clarity, piecemeal implementation which hindered the effectiveness of the reforms, and focusing more on standards-based reform and test-based accountability (Evans, Graham and Lefebvre 2019).

The second-wave CBE movement has been prevailed from the 2000s to the present. The movement began to pick up steam after some schools included demonstration of mastery on the requirements for high school graduation and/or excluded the Carnegie unit, which was developed in 1906 to improve preparation for college admission by standardizing the number of credit hours required for high school graduation, from the basic requirements for graduation (Steele et al. 2014). The second-wave movement is more student-centered than the first-wave movement. CBE has often been associated with other reforms such as personalized learning, deeper learning, and student-centered learning. CBE also uses formative assessment forms, including portfolio and performance-based assessment. In recent years, due to advances in online learning, analytical learning and adaptive learning technology, CBE has caused an evolutionary change in education, especially in university degree programs. The increasing demand for efficiency, effectiveness and verifiable outcomes in education has resulted in a growing global interest in CBE (Ford 2014). The latest development regarding K-12 was that a group of practitioners and policy makers who gathered in 2011 and 2019 set the framework of CBE and described it (Levine and Patrick 2019).

COMPARISON OF COMPETENCY-BASED EDUCATION WITH TRADITIONAL EDUCATION

Compared to traditional education system, Competency-based education is a paradigm shift: it requires changes in basic policies, practices, and structures. It challenges many of the fundamental beliefs and assumptions that the traditional education system has emphasized over the years. In the context of CBE, competency-based learning is an innovation at the center of schooling, and teaching and learning in competency-based systems is significantly different from the traditional system (Casey 2018).

Traditional public schools today consist of fixed 40-45-minute lessons, 180-day school calendar, and a teacher- and content-oriented education provided to all students at the same time regardless of their individual differences (DeLorenzo 2009). In addition, in the traditional education system, students advance to the next grade level without learning thoroughly. Receiving 50 points for the end-of-year grade is enough for a student to get to the next level. However, no one says anything about what should be done about the failure of the remaining 50 points. Those who graduate with honors and with their individual efforts and skills can attend university, but what awaits those students who could not do this remains uncertain. As a result, new groups of students who do not have the necessary pre-requisite skills and knowledge to receive the content offered by their teachers can be filled every year. The statements of Tom Rooney from Lindsay United School District, quoted by Sturgis and Casey (2018, 12), unearth the fact which we all are aware of:

"The reality for many of our graduates is that they soon find out they didn't get what they needed. Some of the kids fall into deep despair when they realize they have been betrayed. They were told that they are ready, but they're not."

CBE supports different forms of instruction, face-to-face, online, and a combination of the two (Burnette 2016). Thus, it provides a larger learning space. Most CBE programs enable students to progress at their own pace through the learning opportunities provided outside of school hours and walls, rather than to progress at a standard pace or time set for every student. In addition, personalized or adaptable learning strategies are used in the contemporary CBE. Advances in adaptive learning technologies have added another dimension to personalized learning and have made way for personalized learning to be implemented more. Adaptive learning tools identify the problem that the student is experiencing and direct the student to the modules that will help student overcome the problem and learn the skills before moving on to the next. As a result, while mastery learning occurs, learning gaps are closed (Klein-Collins 2013).

Here are the differences between Competency-based education and Traditional Education (Levine and Patrick 2019; Sturgis and Casey 2018; Worthen and Patrick 2014):

The traditional system is time-bound. In schools, students are grouped according to their age and they progress at the same pace at the same grade level. Progress continues regardless of whether students need more time to master the content covered. In most cases, teachers strive to realize the learning outcomes specified in their lesson plans within the allocated time even though the students have not been able to achieve the mastery of the content or skill. On the other hand, competency-based education is based on learning and recognizes that students might need more time to learn the concepts and skills deeply. When learning gaps are detected, their previous learning is revisited, and prerequisite learning is supplemented. When students are ready, they are promoted to the next level of competence. Depending on the field/domain and learning objectives, students can follow personalized learning paths instead of linear progression.

The traditional education system focuses on a narrow set of academic outcomes that emphasize academic skills, memorization and understanding of the content, and it does not acknowledge that student success depends on more than just academic knowledge.

–In the traditional educational system, students' projects, written and oral exams, and behaviors are assessed through a points-based grading system. In addition, teachers often have their own grading system, which causes variability in determining success. Although the grading in the traditional system reflects recognition, it is difficult to say that the learning takes place completely. In a competency-based system, on the contrary, the grading is based on learning and competence. Failures and mistakes are seen as part of the learning process. In CBE, grading is designed to promote students' academic skills and their progression in the content and to improve the skills they need to become lifelong learners. No questions are left in students' mind regarding what they should learn, what mastery looks like and how they can demonstrate learning.

–Traditional education system is based on a fixed mindset which is the belief that individuals' "abilities are carved in stone," and it maintains the practice of ranking students which perpetuates models of inequity in society by creating winners and losers among students. CBE, on the other hand, CBE is based on the idea of providing higher standards and better career prospects for each student.

–The traditional system is organized by age and it is based on external motivation. Traditional systems were developed earlier than the research on how children learn and are motivated, but it is impossible not to apply what research has revealed to education

systems. In contrast, in CBE, everything is based on what we know is currently best for students with regard to participation, motivation and learning.

COMPETENCY-BASED EDUCATION PRACTICES

As stated earlier, Competency-Based Education includes online learning environments along with face-to-face instruction to enable students to progress individually and to remediate learning deficiencies. In the literature, it is possible to come across several examples of education with face-to-face instruction only, with online instruction only, or with both. There is evidence that education which is carried out via both online and face-to-face instruction causes higher student performance compared to education with face-to-face instruction only. For example, Scholastic READ 180 program which was implemented in Department of Defense Education Activity Schools through both face-to-face and online instruction was found to be more effective in increasing students' success in reading compared to similar literary intervention programs (Loadman, Moore, Ren, Zhu, Zhao and Lomax 2011). Diversity in CBE is not limited to these. Peer learning, cooperative learning and self-directed learning are also included in learning environments by teachers. As a result, an ideal system consisting of 40% direct instruction, 40% peer teaching and 20% self-directed learning can be achieved (DeLorenzo 2009). When primary education, secondary education, tertiary education and related distance education are included in this diversity of instruction, it can be said that CBE has spread across a wider spectrum. In this section, examples of competency-based learning carried out in various environments and levels are given, relevant research is examined and some important points in CBE design are mentioned.

Interest in the implementations of CBE is increasing year after year, especially in America. On a global scale, its implementations in medical education attract attention; in fact, a new literature has emerged as “Competency Based Medical Education." The implementation of CBE has been made mandatory at the undergraduate and graduate levels of medical education. Take the USA, for example - the US Department of Education and other accreditation institutions have started to demand the expectancy and implementation processes of CBE from higher education institutions. According to Fain (2015), 600 universities and colleges actively use a competency-based education program. These figures in 2015 were limited to only 52 institutions in 2014 (Curry and Docherty 2017).

As mentioned in the historical development section, the second-wave of CBE started after the 2000s, and since then its implementations have continued to proliferate. Serving 214 students in a remote part of Alaska, the Chugach School District won the Malcolm Baldrige National Quality Award in 2001. A 41 percent increase in the reading, English and Math scores of the students over a 4-year period was reported after adopting a competency-based approach (Steele et al. 2014). In a recent example, it was stated that Young Women's Leadership Charter School of Chicago, which serves disadvantaged students and uses a competence-based model, has 35 percent higher graduation rates than the entire Chicago Public Schools. The Diploma Plus program, a network of 27 alternative education programs across the USA, has 17 years of experience in using a model of CBE that offers students the flexible pacing they need for learning (Steele et al. 2014).

The state of New Hampshire in America is known for its state-wide implementations of CBE. In 2005, New Hampshire updated the legislations on education. It started to change these legislations from a system based on “seat time” which was developed in the 19th and 20th centuries to a system based on competencies. New Hampshire eliminated the Carnegie Unit, the standard used to award academic credit on the amount of instructional time and passed legislation requiring the demonstration of mastery. Its implementations in high schools made it possible for schools to award academic credit to the learning that takes place anytime, anywhere and at any speed. The success of Fred Bramante, the former chair of the New Hampshire State Board of Education, in CBE is remarkable. Bramante and Colby (2012) stated in their book

"Off the clock: moving education from time to competency" that the high school dropout rate across the state fell from 20 percent in 2009 to 4 percent in 2011 after CBE was implemented in schools. In addition, students at the state high schools mastered competencies to earn their diplomas and did that in non-traditional ways. The fact that CBE places the learner at the center of education has contributed to this success (Bramante and Colby 2012).

Implementing CBE in only K-12 schools is not enough; teachers who will guide students in a competency-based education should also receive a competency-based education or training. Similarly, it would be ideal if doctors to whom we entrust our health earn their diplomas according to their competencies, not to the time they spend at medical school. Actually, this applies to many professions. For this reason, it can be difficult to separate CBE from vocational education. In short, if competency-based K-12 schools are to be effective, higher education should switch to a competency-based model (Everett 2019).

Implementations of CBE in tertiary education are carried out as a combination of formal education and distance education. For example, Sinclair Community College, Austin Community College and Broward College started implementing competency-based programs in 2013. They have transformed their existing formal and distance education into CBE. The study conducted with the students studying at these universities revealed that the students found the education offered by their university useful. The students also emphasized that the programs enabled them to learn at their own pace and they were cost-effective. In addition, the students stated that CBE is more suitable for students who are mature and disciplined and who can direct their own learning (Rainwater 2016). It is possible to see more examples of CBE in higher education level. Some of the institutions engaged in CBE, especially in distance education, are Western Governors University, Northern Arizona University, Southern New Hampshire University and University of Wisconsin (Kelchen 2015).

While introducing Competency-based education, the importance of conducting formative assessment and the criteria for assessment were mentioned, as well. Considering the examples of assessment in the implementations of CBE in different states, Louisiana allows students to take exams and earn credits for the courses they have previously failed. This policy provides greater flexibility for students, especially in programs where credit-based approaches do not work, but does not make major changes in the structure of learning. In Oregon, CBE is not only used for awarding credits. The state provides many opportunities for students to demonstrate their learning. Teachers carry out formative assessments during instruction and collaborate with their colleagues to improve their practices (Torres, Brett and Cox 2015). Some competence-based schools use a unique grading system, an example of which can be seen in the Spaulding High School in Rochester, New Hampshire. In this high school, students received their grades in A, B, C, NCY, or IWS format. It is probably easy to understand what A, B, and C indicate. NCY stands for "Not Competent Yet" and when students receive this, they go into a relearning and reassessment plan for the course in which they are unable to demonstrate their mastery. In re-learning process, a teacher coach is assigned to the student who has failed, and extended learning and online learning opportunities are provided so that the student can demonstrate competence. Once the student is thought to have developed competence, the student is re-evaluated. Receiving IWS means "insufficient work submitted," which means that the teacher cannot determine the level of student's competence. In that case, the student is asked to participate in some form of credit recovery like receiving online education or retaking the course. As it can be seen, the relearning and reassessment opportunities are an integral part of enabling students to achieve competence in this high school (Bramante and Colby 2012). CBE attaches importance to using minimum success criteria. Broward College allowed its students who passed the unit challenge of the online program with an 81% to take the unit assessment, and the students who earned 81% on that exam were considered to have achieved mastery and completed the course (Rainwater 2016). According to Malan (2000), the student must

demonstrate mastery with 90 percent accuracy in order to eliminate the concerns related to the assessment of the competence (Mulder and Winterton 2017).

One way to evaluate the success of CBE in schools is to conduct research at schools where CBE is implemented. One of such research was carried out by "RAND Corporation" funded by Bill and Melinda Gates Foundation and was about the personalized learning approaches used in foundation-funded schools. Personalized learning is described in a way that it covers basic elements of CBE. A 2-year study conducted by Pane, Steiner, Baird and Hamilton (2015) found that the implementation of personalized learning practices varied significantly among schools. In the study, it was observed that there were several practices employed by the schools to support personalization; however, some practices like progression based on competency were challenging to implement, and they were not very common. They also found that these practices are not unique to schools implementing personalized learning. Another study was conducted in 8 high schools from three New England states in America, four of which were identified as competency-based, while the other four was not. The study was funded by the Nellie Mae Education Foundation and carried out by the American Institutes for Research (AIR). The research focused on students at the 9th grade, teachers, and administrators. Haynes and colleagues (2016) developed surveys to evaluate the experiences of students, teachers, and administrators (Evans et al. 2019). In line with the previous research, the researchers found that CBE applications differ between schools. It was seen that the teachers working at the schools which were not identified as competency based also implemented some CBE practices and that the students from such schools experienced CBE practices. As a result, researchers concluded that the comparison between CBE and schools that were not implementing CBE was in fact false as CBE practices are widespread in high schools (Evans et al., 2019). One last study compared the ACT scores of students in New Hampshire schools which implemented CBE and with the scores of students in California schools offering traditional education. The study found that there was no significant difference between the two groups of students. However, the results revealed the fact that the competence-based education was as effective as the traditional education although it was not found to be more effective. These three studies reveal that each of the practices called as Competency Based is not new, unique or miraculous. However, it can be said that CBE lays the foundations for these practices and causes integrity among them (Everett, 2019).

CHALLENGES OF CBE AND THEIR POSSIBLE CAUSES

Although there is a growing interest in Competency-Based Education, a number of difficulties and problems related to its implementation have been reported (Curry and Docherty 2017; Evans et al. 2019; Everett 2019; Ford 2014; Kelchen 2015; Klein-Collins 2013; Rainwater 2016; Rezgui and Mhiri 2018; Steele et al. 2014; Torres et al. 2015). Some of these difficulties and related problems are failure to settle on a common concept, different practices, lack of authentic and formative assessment, the notion of flexible pacing and students' progression at their own pace, and lack of necessary educational technology.

CBE puts the student at the center of education and takes the context of the school into account; therefore, that CBE practices vary from region to region is normal or expected. However, the variability in how competency is described or referred and how it is used causes a lack of consensus on its definition. As Ford (2014) stated, the lack of clarity in what competency is and of a common definition vocabulary related to CBE causes confusion about the purpose and value of CBE efforts, and such confusion can hinder a collaborative work on education reform and a consensus on a model enabling collaboration. Reaching a conceptual consensus will pave the way for sharing CBE models or practices and implementation of CBE in different places or context (Rezgui and Mhiri 2018).

One of the most critical components of CBE is assessment, which is the part about which most discussions and questions arise. Practitioners have a harder time figuring out how to assess the

competencies rather than identifying them. The challenges related to assessment can be grouped under two headings: assessment strategy and assessors. Steele et al. (2014) stated in their report that how CBE models can best evaluate competencies is a big question mark. Even in a school where teachers shared common grading expectations, the teachers pointed out the difficulties inherent in grading for evidence of competency. The teachers expressed that the evaluation of a successful student was easier than of an unsuccessful student and that it was difficult to distinguish between the students who failed because they did not study and the students who failed despite their work. Another challenge experienced, especially in CBE models where the essence of CBE is not well-understood, is that only observable results are observed on the basis of behaviorism. As Curry and Docherty (2017) stated, "CBE measures only observable results and ignores the complex connections across thought, performance, and context". In CBE, all the competencies can be reduced to observable performances, and there can be one single, preferred pathway for the achievement of competency. Another criticism of CBE is the assumption that the assessors are always objective. It is believed that there may be observer bias and differences, especially in the evaluation of performance. In order to eliminate these challenges and concerns, it is necessary to find effective answers to the following questions: Which methods will be used to evaluate performance? Who is responsible for the assessment? How will these evaluations be used? Assessment can no longer be the weakest link in CBE, only when we find reasonable and satisfactory answers to these questions (Curry and Docherty 2017; Stafford, 2019).

Another challenge experienced in CBE, perhaps the most inevitable one, is the removal of seat time from the measure of progress and the difficulties students experience while progressing at their own pace due to this removal. One of the principles of CBE is to bring education and students together anywhere, and progress through learning that takes place outside the school also causes some difficulties. Torres et al. (2015) expressed that policies on the ways how students earn credit outside school and on the time schedules by which students earn credit can create difficulties for CBE implementations. Regarding the variability of time, some problems have also been reported in the adoption of CBE in higher education. Another challenge that research pointed out is that CBE may not fit into fixed academic timetables or schedules because students might spend different amount of time on achieving competency (Everett 2019). Sometimes this even take longer than the fixed timetable schedule. Of course, the opposite is also true; a student can demonstrate competence earlier than the other students in the same level. Since these students' progress cannot be prevented, it is believed that existing systems will stress on the instruction. In addition, students progressing at their own pace also need immediate feedback. Trevino, one of the faculty whom Rainwater (2016) interviewed in qualitative research, said "when you have this volume of work, things can get unmanageable."

As mentioned above, another difficulty experienced in CBE is the lack of necessary technological systems. That is, there is especially a lack of package courseware products necessary to monitor students' progress on competencies. The existing systems do not provide necessary feedback about the students who need support according to the evaluation of their performance (Priest et al., 2012).

As it is understood from the difficulties and problems, the most important concern regarding CBE is not the rejection of the concept, but how the competencies which occur at the end of CBE are used. Challenges may also vary depending on how competencies are used. Competency-based models can contribute to the clarity of teaching domains and the personalization of learning. CBE also increases resource efficiency. Allowing students to advance to the next level as they already have the required knowledge, skills, and competence can accelerate their learning. Besides, education has long been seen as a bridge for upward social mobility, and CBE is a reform that widens that bridge (Stafford, 2019). Then, what lies at the root of such problems related to CBE? The answer is trying to implement new systems

with old habits. The notion of 9-month school period still prevails in the USA and many other countries. The competency-based models implemented have also been used to give a passing grade and credit. It is seen as a behaviorist/behavioristic reform and limited to assessment. In short, as the review of the literature indicates, these difficulties are experienced because of the persistence in the practices (i.e., accountability and excessive emphasis on assessment) that caused CBE to lose its momentum of first-wave movement in the 1960s, s of power of YTE's first movement in the 1960s.

DISCUSSION AND CONCLUSION

As the findings of this study indicate, there is a broad consensus on the concepts of skill and learning outcome and they are in widespread use. However, the same cannot be said for the concepts of competency, qualification, proficiency, and ability. Although the concept of ability has a higher matching rate compared to the other three concepts, more than half of the experts in Educational Sciences do not use the concept of ability as the way it is stated in the literature. The experts who participated in the study expressed different opinions on the definitions of the concepts of competency, qualification, and proficiency. The participants state that the definitions of the concept of proficiency found in the literature belong to the concept of qualification rather than proficiency. Similarly, they associate the definitions provided with regard to the concept of qualification with the concepts of competency and proficiency, rather than the concept of qualification. Although the findings indicate that there is a broader consensus on the concept of competency, the number of the experts in educational sciences who think that these are not the definitions of the concept of competency is higher. In addition, as the findings show, some of the experts express the definitions of qualification are associated with certificate and diploma and the definitions of skill are with habit and reflex. This confusion among the concepts of competency, proficiency, and qualification causes the approaches such as CBE and Proficiency-Based Education which center these concepts to be used interchangeably. Evans et al. (2021) have concluded that it is difficult to completely separate the CBE approach and its implementation from other concepts. They have put forth that the facts that CBE is in some ways related to other concepts and some CBE definitions overlap with them make it difficult to differentiate CBE with personalized learning, student-centered learning, and proficiency-based education. This result is thought to be in parallel with the findings of the current study.

It is possible to come across studies in which the concept of competency is used in different meanings. For example, while Adıgüzel (2017) and S. Yıldırım and Yıldırım (2019) use "competency" as "proficiency", Özkal (2018) uses it accurately as "competency." Based on this, in this study which aims to reach a conceptual consensus, the agreed definition of "competence" is the definition provided in the TQF (MYK 2015, 19). According to this, "*competence is the use of knowledge and skills in an area of work or learning by taking responsibility and/or displaying autonomy", identifying and meeting learning needs, and taking account of social and moral issues and responsibilities"*.

This study set out to identify experts' orientation towards the definitions of Competency-Based Education and to reach a consensus on them. As the results have indicated, among the definitions of CBE which have been suggested since the 1970s, the experts who participated in this study agreed mostly with the recent ones. In addition, the fact that these definitions contain concepts related to practice increases the rate of agreement. Another striking finding of this study is that the rate of "undecided" was very high in some definitions. Although these definitions are found in the literature, the experts were not sure whether to agree or disagree with them. This result is consistent with what Evans et al. (2021) have expressed, which is the view that the literature is not integrated.

CBE is an outcome-oriented and individual-oriented process which includes group-work, process evaluation, and flexible learning experiences and enables learners to acquire knowledge, skills, and attitudes. The definition by Levine and Patrick (2019) includes this synthesis. As the researchers, although we believe that a conceptual consensus on the definition of CBE can be reached by using this definition, the CBE definition that we put forth to contribute to the literature is as follows: "Competence-Based Education is the process in which learners progress according to their competencies certified by formative process evaluation rather than the time they spend at school, they are supported in every stage of their education for mastery learning, and they gain the knowledge, skills, and attitudes necessary for them to become lifelong learners."

The experts from Educational Sciences stated that they mostly use Qualifications-Based Education as an alternative to CBE. There are also examples in the literature where Competency-Based Education and Proficiency-Based Education are used interchangeably. However, this usage is considered to be wrong (Klein-Collins 2013; Silvernail, Stump, Atkinson Duina, and Moran Gunn 2013; Levine and Patrick 2019). According to Silvernail et al. (2013), qualifications-based system standards are used to guide the educational program and teaching. Students have to progress by verifying their qualifications through educational standards. Unlike Qualifications-Based Education, CBE defines standards as broad expressions of competence that students must demonstrate throughout a learning process, rather than as isolated standards lists that are evaluated separately (Sturgis 2012). Therefore, using Qualifications-Based Education and CBE interchangeably is not appropriate.

After achieving conceptual clarity about CBE, this study pursued other sub-objectives and sought to trace competencies, starting with the educational programs and curriculum in Turkey, and to examine CBE in theory and practice.

All that has been shared about CBE can be summarized through three descriptive features stated by Steele et al. (2014). 1) Instruction takes place wherever the student is (flexible pacing and progression). CBE takes students' existing level of competence as the starting point, not their age. 2) Students have the opportunity to personalize their learning. CBE is based on the notion that students learn in different ways, have different competency levels, and have different opportunities to learn outside school. 3) Students demonstrate competence by applying their knowledge and skills and earn credit. This reflects three distinctive dimensions of CBE: flexible pacing, student-centered approach, and mastery learning.

After examining CBE through its historical foundations, questions like "why is there a need for reform?" and "how is CBE different from traditional education?" became the focus of the study. Sturgis and Casey (2018) asked the following question after stating the failures revealed by The National Assessment of Educational Progress "are such results really shocking?" A similar question can arise out of the poor results of Turkish students in PISA or university entrance exam: are we really surprised? The vicious cycle of getting disappointing results continues, but how can we expect different results when the traditional education system is designed to rank students in order of success rather than provide opportunities for all students to learn? Another similar question is asked by Bramante and Colby (2012): when you ask a question to any high school math teacher about their students' mastery of mathematics, the answer to your question will probably be no because most students never showed competence in the subject in elementary education; in other words, because the students have a weak foundation in the subject. Then, why do we even think that students will learn it on their own after demonstrating failure, not competence, in the third grade? It is impossible to get satisfactory answers to these questions. The sad truth is that Aytuna (1929, 72), who contributed greatly to Turkish National Education almost 100 years ago, gave a striking answer to this question. In his book, Didaktika, he expressed:

> *"It is unlikely to expect an education based on materialism to cultivate students because most comprehensive subjects which actually overload the program are covered by means of lectures only: they are covered rapidly, without satisfactorily comprehended, studied or experienced, and regardless of checking if the students understand them or not. Students' comprehension and learning are left to their individual efforts, accomplishing this by studying the subject at home from the books. Even if the students are able to learn the subject with their individual efforts, learning that is not related to real life is useless and dead. In an education provided in this way, the success achieved is for the school. However, education should be for life, not for school."*

Although this fact was expressed a hundred years ago, we are still trying to maintain the current system. Educators and students in many countries, especially in Turkey, have already accepted the idea that some students are successful, and some are not. Perhaps due to this understanding, we are maintaining the existing system. Regardless of their curriculum approach or instructional strategy, educators should seek a reform and turn to CBE when they realize that the traditional education system is never designed in a way that all students should and/or can succeed (Sturgis and Casey 2018).

When CBE practices and existing models are examined, it is concluded that there are differences among competency-based schools. In addition, some studies have demonstrated that some practices associated with CBE are implemented in schools which are not competency-based, as well. It is also stated that a consensus on the concepts or vocabulary related to CBE has not achieved yet. Some of the existing concepts consist of words that have been stripped of their meaning (Ryan and Cox 2017). A similar situation can be observed in Turkey: concepts like result, performance, outcome, acquisition, goal, competence, competency, skill and qualification are frequently used interchangeably. In fact, it is normal for CBE to be so diverse in practice. When the relevant literature is examined, it can be seen that CBE does not have a properly packaged model. As Ford (2014) stated, various forms of CBE are adopted to various educational environments. Whether a right form of CBE is applied or not can be understood through successful demonstration of the specified competencies. Casey (2018) stated that educators and leaders who set educational policies accept that there is not one single "right" set of competence; therefore, competencies can be and should be customized according to local conditions.

Every reform that is considered necessary today has always been anchored in recent developments in technology because technology has advanced faster than ever in recent years. This study split the history of CBE in two and set out that the essential difference distinguishing the second-wave of the movement than the first is online education. In addition, technology makes it easier to assess students' competence effectively and give necessary feedback to them. Similarly, technology makes it possible for students to progress at their own pace and for educators to identify and eliminate learning gaps. Ford (2014) also expressed that as a result of institutions' desire to improve their effectiveness and efficiency, the ability to sustain a competency-based education model is dependent on their ability to successfully utilize while integrating the processes for CBE design, delivery, assessment, and reporting. Thus, a consistent, unified, and systematic model that aims to produce graduates who have achieved competence specified by the institution can be developed. In addition, there is a growing need for a comprehensive record-keeping system to publish, store, and process data about students' learning and for online technologies to use these data at the program level in real time. Rainwater (2016) gives the following advice to institutions that want to implement the Competency-Based Education model; Decide if the CBE is right for the organization, build a competency-based model, develop authentic assessments of competencies, develop learning paths to achieve the desired competency, and finally ensure that the organization managers have a system to monitor and report on students' progress in competencies. As can be understood from these recommendations, it is not easy to design and implement a CBE model. It is

particularly difficult to identify competencies and to identify appropriate, authentic, formative assessment pathways for them. For this reason, creating a competency-based systematic model can be started with applications such as planning the courses in the curriculum at smaller scales or preparing certificate programs.

Bringing education to students everywhere is no longer a choice, but a necessity. Changes occur not only in technology but also in nature. Disasters one after another and the Covid-19 pandemic experienced at the time of this study imprisoned students and educators in their homes. As is known, this is neither the first nor the last epidemic. It became apparent that the only way to sustain education in a situation in which all the workplaces, institutions and schools were closed was to use online learning and distance education tools. Countries with online or distance learning systems instantly switched their education, from K-12 to higher education, from online settings to these platforms. Countries that lacked such systems had no choice but to cease all educational activities. Turkey, on the other hand, started to implement distance education via television channels and the internet only one week after the first coronavirus case in the country. Ministry of National Education in Turkey brought students and teachers together on its Education Information Network, known as EBA. This way, Turkey managed to bring education to students wherever they were, which is one of the key components of CBE. More importantly, the experiences of Turkey showed all countries that such education "is possible." Although distance education did not actually provide all the opportunities that face-to-face education offers, an invaluable tool for support and individual learning was obtained at the end of this process. Experience shows that online learning and distance education will become an inseparable part of education system in Turkey.

Success in Competency-based education is subject to many variables. Success in traditional education is measured by students' knowledge or lack of knowledge. However, what is important is not that the student knows, but that the student can transfer what is learned to unknown situations. Bramante and Colby (2012) stated that the student must demonstrate the ability to transfer the content and skills in a unique situation in order to be qualified as competent. Demonstrating or proving competence should not be confused with accountability policies. As Sturgis and Casey (2018) stated, accountability policies of first-wave CBE movement " made sense as an effort to create transparency and expose inequitable outcomes," but they do not help provide equal educational opportunities for students, let alone promote effective instruction and learning according to all what is known about the field of learning sciences. For this reason, the first-wave movement lost its power and retreated from the field for a while. As is seen, it is important to use CBE effectively. As Curry and Docherty (2017) pointed out, "when used effectively, CBE works as an advanced organizer and allows teaching (and learning) to focus beyond simple knowledge, skills, and attitude acquisition towards application, transfer, and impact assessment". However, when CBE is used ineffectively, it becomes nothing but a bureaucratic checklist limiting intellectual flexibility and creativity for both students and teachers. So, what should be done to develop an effective CBE system? Torres, et al. (2015, 23) shared the following four elements to have a successful and effective CBE system: *"1) defining and adopting competencies, expressed with unambiguous and specific statements 2) developing formative and summative assessments to measure progress toward mastery, 3) providing students and teachers with necessary support, 4) creating and adopting structures promoting competency-based learning"*. In short, achieving success is considered possible through following such steps as defining clearly, measuring effectively, supporting and ensuring continuity. A student-centered and progressive education approach should be pursued in order for these actions to suffice. Only then can we join the revolution started by John Dewey, who fundamentally changed the way we see things as Copernicus did.

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