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COMPARATIVE ANALYSIS of TOP-PERFORMING COUNTRIES in PISA and TURKIYE'S TEACHER COMPETENCES

PISA'DA EN İYİ PERFORMANS GÖSTEREN ÜLKELERİN ve TÜRKİYE'NİN ÖĞRETMEN YETERLİKLERİNİN KARŞILAŞTIRMALI ANALİZİ

Orhan ATAMAN [1], Ali ORHAN [2]

ÖZ: Bu çalışmanın amacı, PISA'da en iyi performans gösteren ülkeler (Singapur, Hong Kong, Estonya, Kanada) ile Türkiye'nin öğretmen yeterlik çerçevelerini (ÖYÇ) karşılaştırmak ve bu ülkelerin öğretmen yeterlikleri arasındaki benzerlikleri ve farklılıkları ortaya koymaktır. Çalışmada karşılaştırmalı eğitim yöntemi kullanılmıştır. Örneklem olarak PISA'da başarı gösteren farklı bölgelerden ülkeler seçilmiş ve bu ülkelerin ÖYÇ'leri başlıca veri kaynakları olarak incelenmiştir. Verilerin analizinde betimsel analiz kullanılmıştır. Bu çalışmanın sonucunda, "alan bilgisi, pedagojik beceriler, öğretmenlerin sürekli mesleki gelişimi ve işbirliği, öğrenci gelişimini destekleme"nin Türkiye dâhil incelenen tüm ülkelerin ÖYÇ'lerinde ortak olan yeterlikler olduğu görülmüştür. Ancak günümüz dünyasında oldukça önemli olan "Teknolojik-pedagojik beceriler" alanı sadece Estonya'nın ÖYÇ'sinde bulunmaktadır. ÖYÇ'lerin yayın yıllarının büyük farklılıklar gösterdiği görülmüştür. İncelenen ülkelerin ÖYÇ'lerinin büyük ölçüde benzerlikler gösterdiği, ancak aralarında bazı farklılıkların da olduğu sonucuna varılmıştır. Son olarak, Türkiye'nin ÖYÇ'sinin PISA'da en iyi performans gösteren ülkelerin ÖYÇ'leri ile büyük ölçüde benzerlikler gösterdiği görülmüştür.

Anahtar sözcükler: öğretmen yeterlikleri, öğretmen yeterlik çerçevesi, PISA, teknolojik-pedagojik alan bilgisi

ABSTRACT: The aim of this study is to compare the teacher competency frameworks (TCFs) of top performing countries in PISA *(Singapore, Hong Kong, Estonia, Canada)* and Türkiye and to reveal the similarities and differences among teacher competences of these countries. Comparative education method was used in the study. Successful countries in PISA from different regions were chosen as sample countries. Official documents on teacher education and specifically TCFs of sample countries were examined as the main data sources. Descriptive analysis was used for the analysis of data. This study revealed that "subject matter knowledge and pedagogical skills, teachers' continuous professional development and collaboration, and supporting student development" are the in common competences in all sample high-achieving countries' TCFs including Türkiye. However, "Techno-pedagogical skills" domain, which is quite important in today's world, exists only in Estonia's TCF. It was seen that publishing year of TCFs differs greatly. It was concluded that sample countries' TCFs have similarities largely while there are also some differences among them. Finally, it was seen that Türkiye's TCF shows similarities to sample top-performing countries' TCFs to a great extent.

Keywords: teacher competences, teacher competency framework, PISA, techno-pedagogical skills

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[1] Dr. Öğr. Üyesi, Sakarya Uygulamalı Bilimler Üniversitesi, Sakarya/Türkiye, e-mail: atamanorhan@gmail.com, ORCID: 0000-0003-1655-1539
[2] Öğr. Gör. Dr., Zonguldak Bülent Ecevit Üniversitesi, Zonguldak/Türkiye, e-mail: ali.orhan@beun.edu.tr, ORCID: 0000-0003-1234-3919

GENİŞLETİLMİŞ ÖZET

Giriş

Son yıllarda birçok ülkede öğretmen kalitesini artırmak için çeşitli düzenlemeler ve reform hareketleri (örneğin, temel öğretmenlik eğitiminin iyileştirilmesi, öğretmenlik meslek standartlarının veya yeterlilik çerçevelerinin geliştirilmesi, öğretmenler için kariyer basamaklarının oluşturulması vb.) olmuştur (OECD, 2013). Gläser-Zikuda ve Fuβ (2008), öğretmen yeterliklerinin öğretim kalitesinin önkoşulu olarak düşünüldüğünü öne sürmektedir. Dolayısıyla, öğretmenlik mesleğine yönelik yeterliklerin belirlenmesi ve bunların öğretmenlerden istenilmesi nitelikli öğretmen yetiştirme ve seçme konusunda önerilen çözüm yollarından biri olduğu söylenebilir.

Bu çalışmanın amacı, PISA'da en iyi performansı gösteren ülkeler (Singapur, Hong Kong, Estonya, Kanada) ile Türkiye'nin öğretmen yeterlilik çerçevelerini (ÖYÇ) karşılaştırmak ve bu ülkelerin öğretmen yeterlilikleri arasındaki benzerlikleri ve farklılıkları ortaya koymak ve ayrıca Türkiye için önerilerde bulunmaktır.

Yöntem

Bu çalışmada betimsel araştırma yöntemi kullanılmıştır. Ayrıca betimsel araştırma desenlerinden biri olan karşılaştırmalı eğitim yöntemi uygulanmıştır.

Araştırmaya dahil edilen ülkeler amaçlı örnekleme yöntemi ile seçilmiştir. Çalışmada PISA'da üstün başarı gösteren ülkeleri dâhil etmek için aykırı durum örneklemesi (extreme case sampling) tekniği kullanılmıştır. Ayrıca, farklı sosyal ve kültürel yapılara sahip farklı bölgelerden ülkeleri dâhil etmek için maksimum çeşitlilik örnekleme tekniği kullanılmıştır. Sonuç olarak, 2015 ve 2018 PISA sıralamalarına ve coğrafi konumlarına göre; Singapur (Güneydoğu Asya'dan), Hong Kong (Doğu Asya'dan), Estonya (Avrupa'dan) ve Kanada (Kuzey Amerika'dan) çalışmaya dâhil edilecek ülkeler olarak belirlenmiştir.

Veriler doküman analizi tekniği ile toplanmıştır. Bu çalışma için ana veri kaynakları olarak belirlenen ülkelere ait öğretmen eğitimi hakkındaki resmi belgeler ve özellikle ÖYÇ'ler incelenmiştir.

Verilerin analizinde betimsel analiz kullanılmıştır. Betimsel analiz, verilerin mevcut temalara göre özetlenmesini ve yorumlanmasını gerektirir.

Bulgular

Çalışma kapsamında ele alınan tüm ülkelerin ÖYÇ'lerinde yeterlik alanı başlıklarının oldukça farklı olmasına rağmen, bu ülkelere ait yeterlik alanlarının üç ana başlıkta ortak bir şekilde sınıflandırılabileceği görülmüştür. Bunlar şu şekilde sıralanabilir: *i) alan bilgisi ve uygulama, ii) mesleki gelişim ve işbirliği, iii) öğrenci gelişimi.*

Öte yandan, örnekleme dâhil edilen ülkelerin ÖYÇ'lerinde ortak bir şekilde bulunmayan bazı yeterlik alanlarının olduğu görülmüştür. Bu bağlamda, Singapur ve Hong Kong'a ait ÖYÇ'lerde "*ebeveynlerle işbirliği"* olarak adlandırılabilecek bir yeterlik alanına yer verildiği görülmüştür. Ayrıca, yine Singapur ve Hong Kong ÖYÇ'lerinde "*normlar"* adı altında sınıflandırılan yeterlik ifadelerinin bulunduğu görülmüştür. Bu ifadeler, öğretmenlerin eğitim sistemi ve toplum hakkında hem yazılı hem de yazılı olmayan kuralların farkında olmasıyla ilişkilidir.

Araştırma kapsamında ele alınan ülkelerin ÖYÇ'leri arasındaki bir diğer farklılık ise, Estonya'nın ÖYÇ'sinde diğer en iyi performans gösteren ülkelerin ÖYÇ'lerinde bulunmayan iki yeterlik alanına yer verilmesidir. Bunlardan ilkinin "*teknolojik-pedagojik alan bilgisi*" diğerinin ise "*özel eğitim ihtiyaçları olan öğrenciler"*e yönelik yeterlikler olduğu ortaya çıkmıştır.

Tartışma ve Sonuç

Çalışma sonucunda, örnekleme dâhil edilen ülkelerin ÖYÇ'lerinde tasarım, ana yeterlik alanlarının adlandırılması, ana yeterlik alanlarının ve temel yeterliklerin sayısı, yeterliklerin ne kadar ayrıntılı açıklandığı ve birtakım yeterliklerin daha fazla vurguladığı konusunda farklılıkların olduğu sonucuna varılmıştır. Öte yandan, temel yetkinlikler olarak ifade edilen nitelikler (bilgi ve beceriler) ve yeterlik açıklamaları arasında önemli benzerlikler olduğu söylenebilir. Bu bağlamda, "alan bilgisi, pedagojik beceriler, öğretmenlerin sürekli mesleki gelişimi ve işbirliği, öğrenci gelişimini destekleme"nin Türkiye dâhil incelenen tüm ülkelerin ÖYÇ'lerinde ortak olan yeterlikler olduğu görülmüştür. Bu özellikler nitelikli bir öğretmen olmak için en temel ve gerekli yeterliklerdir (Darling-Hammond, 2006b). Özetle, örnek ülkelerin ÖYÇ'lerinde bazı farklılıklar olsa da özünde büyük ölçüde benzerlikler taşıdığı söylenebilir. Akın ve Sözen-Özdoğan (2021) Singapur, Hong Kong ve Türkiye'nin öğretmen yeterliklerini karşılaştırdıkları çalışmada benzer bir sonuca ulaşmışlardır.

Bu çalışmanın en önemli sonuçlarından biri, Estonya'nın ÖYÇ'sinde diğer ülkelerin ÖYÇ'lerinde bulunmayan "teknolojik-pedagojik beceriler" ve "özel eğitime ihtiyacı olan öğrenciler" olmak üzere iki yeterlik alanına yer verilmesidir. Özellikle de günümüzün teknoloji odaklı dünyasında tekno-pedagojik becerilere ilişkin yeterliklere yer verilmemesi büyük bir eksiklik olarak düşünülmektedir.

Son olarak, Türkiye'nin ÖYÇ'sinin PISA'da en iyi performans gösteren ülkelerin ÖYÇ'leri ile büyük ölçüde benzerlikler gösterdiği görülmüştür. Ancak Türk eğitim sisteminin çıktılarının diğer örnek ülkeler kadar memnun edici olmaması ve PISA gibi bazı uluslararası sınavlarda Türkiye'nin yerinin diğer ülkelerin çok gerisinde olması önemlidir. Bu nedenle, belirlenmiş olan öğretmen yeterliklerinin öğretmen adaylarına kazandırılması ve öğretmenlerin bu becerileri kullanabilmeleri, tüm sorumlu paydaşlar tarafından dikkatli bir şekilde ele alınmalıdır.

INTRODUCTION

Education has been recognized as the key to national development and modernization of a country. Aboyi (1994) argues that the wealth and the power of a nation depend on providing a superior and divergent education to its citizens. He also adds that education stands out among all the factors necessary for assuring the contemporary development of a country. Darling-Hammond (2006a) states that citizens as the workforce of the countries need more knowledge and skills to adapt, to survive and to succeed in today's rapidly changing world; therefore, requirements for learning are now higher than they have ever been before. Similarly, Saylan (2014) states that since the quality of workforce that fosters the development of countries is strongly related to quality of teaching, education is one of the most important elements to guide, train and develop individuals and societies. National Council for Teacher Education (NCTE) states that the quality of a nation depends mostly on its teachers' quality (NCTE, 1998). Similarly, National Policy on Education (1986) suggests that "No society can raise above the standard above of its teachers".

Teachers are the key figures in educational process, so the success of teaching largely depends on quality of their preparation and performance (Nessipbayeva, 2012). Also, NCTE (1998) states that teachers are the most important component in any educational process since teachers hold full responsibility for implementation of the educational programs at any stage. In short, quality of education is crucial both for individuals and nations' success, and a growing number of studies suggest that teachers' competences are the most significant contributors to students' achievement among all educational resources (Darling-Hammond, 2006a). In other words, it can be argued that development of countries depends on the quality of education, and quality of teaching is generally associated with quality of teachers (Atar, 2014; Barber & Mourshed, 2007; Blömeke et al., 2016; Darling-Hammond, 2000; Darling-Hammond et al., 2010; Erdem, 2015; Hattie, 2009; Haycock, 1998; Heck, 2009; Ifunanya et al., 2013; Kaplan & Owings, 2001; Organization for Economic Cooperation and Development [OECD], 2005). As a result, it can be suggested that the importance of providing effective teaching for the young generations is getting increasingly significant for the nations. Therefore, the importance of teacher education as an academic field is increasing since it improves the quality of teachers and students' performance (Symeonidis, 2018).

Considering these arguments, it can be claimed that the main reason for the regulations and reforms of teacher education systems in a large number of countries in recent years is to have high quality teachers who are capable of effectively developing the competences of students and helping them reach their potential (OECD, 2015). To increase the quality of teachers, there have been various regulations and reform movements such as; improving initial teacher education and professional development, developing teaching standards or competence frameworks, introducing career stages for teachers and so on (OECD, 2013). Pantic and Wubbels (2010) state that reforms, which have been introduced to make initial teacher education more efficient and to develop the competences that teacher candidates will need in practice, have become quite significant around the world. Similarly, Gläser-Zikuda and Fuβ (2008) argue that teacher competencies are thought to be preconditions for instructional quality as a result of the discussions about the quality of instruction among educators, researchers, and policymakers. Hence, it can be suggested that identifying the competencies for teaching profession and requiring them from the teachers have been one of the proposed solutions to train and select high-quality teachers. Figure 1, which summarizes the arguments presented so far, indicates that equipping teacher candidates with required competences is the first step for the development of nations in the long run.

Figure 1. The longitudinal effect of teacher education on national development

The term "competence" started to gain importance in 1970s with David McClelland's (1973) article titled "Testing for Competence Rather than for Intelligence" (Zanella et al., 2017). The author defined competence as characteristics which usually make a person associated with a superior performance in performing a task, or situation. He suggests that competencies mainly refer to required knowledge to perform a given task. Pacevicius and Kekyte (2008) define competencies as "a combination of professional knowledge, abilities and skills as well as an ability to apply them following the requirements of work environment." Durand (1998) defines competence as "a set of interdependent knowledge and skills which are essential to achieve the goals". Turkish Ministry of National Education (MoNE), defines teacher competencies as "the knowledge, skills, values and attitudes that teachers need to have to be able to perform teaching profession effectively and efficiently" (MoNE, 2017). To conclude, teacher competencies can be defined as the requirements which include the knowledge, skills and values that both teacher candidates and teachers must attain and demonstrate to complete a teacher education program or to be hired by authorized bodies. Teacher competencies describe what teachers should know and be able to do.

Thanks to international exams, such as; Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) countries are able to evaluate the performance of their education system in terms of various aspects and find the opportunity to compare their performance with other countries. In recent years, PISA has come to the fore to compare countries' education quality. PISA is an international assessment program administered by OECD in every three years and it aims to evaluate participating countries educational performances by testing 15-year-old students' skills and knowledge in science, mathematics, reading, collaborative problem solving and financial literacy (OECD, 2018a). It is aimed to measure the students' ability to use the knowledge and skills -they have learned during the education process- in their daily lives (PISA, 2018). PISA is scored in terms of reading, science, and mathematics literacy. PISA was first applied in 2000 in 43 countries and the number of participating countries has increased over the years. In 2018, over a half million students in 79 countries sat for the two-hour exam (OECD, 2019a).

Türkiye ranked 50th in 2015 and 40th in 2018 based on average scores in those years. It is clear that Türkiye fell behind most of the countries and it fell behind the OECD average score. This situation brings about serious concerns on education quality in Türkiye and researchers try to find out the reasons for Türkiye's low-performance in PISA. The literature review on comparing Türkiye to high-achieving countries in PISA in terms of teacher training perspective reveals that most of the studies focus on teacher training systems of these countries (Abbasioğlu, 2017; Akgül, 2017; Avcı & Yücel-Toy, 2018; Boran-Yılmaz et al., 2019; Çınar & Doğan, 2019; Göçen-Kabaran & Görgen, 2016; Gül, 2016; Gültekin & Özenç-İra, 2019; İş, 2017; Kalkan, 2021; Mete, 2013; Orakçı, 2015; Özerbaş & Safi, 2022). However, it was seen that there are only few studies comparing teacher competences of Türkiye to successful countries in PISA in the literature. Can-Aran and Derman (2020) examined the science teachers' competencies of several successful countries in PISA and then analyzed the science teacher education program of Türkiye updated in 2018 by the Council of Higher Education. It should be noted that Can-Aran and Derman (2020) investigated and compared specifically the science teachers' competencies and not the general teacher competencies. The current study differs from their study in this sense. Akın and Sözen-Özdoğan (2021) compared Türkiye's general teacher competencies to Singapore and Hong Kong's teacher competencies. It should be added that sample top performing countries in the current study include countries from different regions with different social and cultural structures (Estonia and Canada along with Singapore and Hong-Kong), so it is thought that the current study differs from Akın and Sözen-Özdoğan's (2021) study in this sense.

As a result, it was seen that there is very limited research examining the teacher competency frameworks (TCFs) of top performing countries in PISA and comparing it with Türkiye's TCF. It is thought

that analyzing the teacher competences of top performing countries in PISA may reveal the core knowledge and skills that teachers in these countries possess and apply in their classes. In this respect, the aim of this study is to compare the teacher competency frameworks (TCFs) of top performing countries in PISA (Singapore, Hong Kong, Estonia, Canada) and Türkiye and to reveal the similarities and differences among teacher competences of these countries, and also to make suggestions for Türkiye. For this purpose, the following research questions are to be answered:

1. What are the key components of TCFs of sample top performing countries in PISA and Türkiye?
2. What are the similarities and differences;
    a. among sample top performing countries' TCFs regarding content of core competences and competency descriptors?
    b. between Türkiye and sample top performing countries' TCFs regarding content of core competences and competency descriptors?

METHOD

Research Design

Descriptive research method, which aims to present an existing situation as holistically and comprehensively as possible, was used in this study. Descriptive method is used to summarize the characteristics of individuals, groups or physical environments in a detailed way (Büyüköztürk et al., 2018; Cohen et al., 2007). Also, comparative education method which is one of the descriptive research designs, was applied. Comparative education models determine the basic values and policies that shape education, help to see the reasons for success and failure, and can be a guide in solving the identified problems (Türkoğlu, 2012). Comparative education also helps decide which factors should be taken into account when developing educative applications, and which factors are the most important (Epstein, 1983).

Sampling and Data Sources

Countries included in the study were selected by purposive sampling method. Extreme case sampling technique, which is one of the purposeful sampling techniques, was used in the study. It is used to select cases that are unusual or special in some way; such as, outstanding successes or notable failures (Patton, 2002). In line with this explanation, it was aimed to choose countries which have shown outstanding success in PISA in this study. In addition, maximum variation sampling technique was used to include countries from different regions with different social and cultural structures. As stated before, PISA results are announced in terms of reading, science, and mathematics scores by OECD. However, to simplify the rankings of countries and to get an overall perspective, an average score was calculated by adding scores of all three areas and dividing it into three. As a result, Singapore (from Southeast Asia), Hong Kong (from East-Asia), Estonia (from Europe) and Canada (from North America) were chosen as sample countries to be included in the study based on their rankings in PISA-2015 and PISA-2018 and their geographical location. Table 1 presents the ranking of countries in PISA-2015 and PISA-2018 based on average score of mathematics, science and reading scores (OECD, 2018b; OECD, 2019b).

Table 1.
Ranking of Countries in PISA-2015 and PISA-2018 Based on Average Score of Mathematics, Science and Reading Scores

Rank	2015 PISA Rankings	Rank	2018 PISA Rankings
1.	**Singapore**	1.	China*
2.	**Hong Kong**	**2.**	**Singapore**
3.	Japan	3.	Macau
4.	Macau	**4.**	**Hong Kong**
5.	**Estonia**	**5.**	**Estonia**
6.	**Canada**	6.	Japan
7.	Taiwan	7.	South Korea
8.	Finland	**8.**	**Canada**
9.	South Korea	9.	Taiwan
10.	China	10.	Finland
50.	Türkiye	40.	Türkiye

*Beijing, Shanghai, Jiangsu, Zhejiang

Singapore's TCF developed by the National Institute of Education, Nanyang Technological University (National Institute of Education, 2009) was included in this study. It was introduced in 2009 as one part of innovative model called "Teacher Education Model for the 21st Century" (TE21). This framework has introduced various reforms in initial teacher education programs and lifelong teacher professional development practices that still exist today (Rajandiran, 2021).

Hong Kong's TCF developed by "Advisory Committee on Teacher Education and Qualifications" (ACTEQ) and called as "The Teacher Competencies Framework and The Continuing Professional Development of Teachers" (ACTEQ, 2003) was included in this study. ACTEQ works on reforms to improve the professional quality of teachers in three broad categories; initial teacher education, the professional development of beginning teachers and the continuing professional development of practicing teachers (ACTEQ, 2003).

It was seen that Estonia has various TCFs for different specialization areas such as; primary school and early childhood teachers, vocational education teachers, special needs teachers. In this study, a more general framework (Occupational Qualification Standard, 2020) developed for "secondary education teachers" was examined.

As for the Canada, it was observed that TCFs differ among the ten provinces which constitute the country. Therefore, considering the populations of the provinces, Ontario was included in the study since it is the most crowded province in the country with about 39 percent of the total population. Ontario College of Teachers' teacher competency framework (Ontario College of Teachers, 2016; Ontario College of Teachers, 2022) was examined for this study. The Ontario College of Teachers accredits teacher education programs in universities in Ontario. It governs, licenses and regulates the teaching profession in Ontario.

Finally, General Competencies for Teaching Profession developed by the Turkish Ministry of National Education (MoNE, 2017) was included in the study.

Data Collection and Data Analysis

Data were collected by document analysis technique which is one of the qualitative research methods. Document analysis is a systematic procedure for examining and evaluating documents. It includes the processes of interpreting the data and making sense of the data for the research problem (Corbin & Strauss, 2008). Document analysis consists of five stages as follows; accessing the documents, checking the originality of the documents, understanding the documents, analyzing the data and using the data (Yıldırım & Şimşek, 2013). In line with these explanations, countries' official documents on teacher education and specifically TCFs were accessed and examined as the main data sources for this study. In addition, some other data sources such as articles, reports and regulations were examined to have a deeper understanding of the frameworks.

Descriptive analysis was used for the analysis of data. Descriptive analysis requires summarizing and interpreting the data according to existing themes. Data are classified, summarized and interpreted according to certain themes. The main purpose of this type of analysis is to present the findings to the reader in an organized form. A relationship is established between the findings and, if necessary, comparisons are made between the cases. In this type of analysis, the researcher often includes direct quotations (Yıldırım & Şimşek, 2013).

In the analysis process, each countries' TCF was first examined in an overall view and main competency domains were determined. Next, core competences and the descriptors were examined in detail, and then they were coded according to their content. The initial findings belonging to codes of descriptors were associated with core competences and they were classified under main competency domains. As a result, the frameworks were compared and similarities and differences were revealed.

Validity and Reliability

To ensure the validity and reliability of the research, various methods were used in terms of credibility, consistency and confirmability, transferability (Yıldırım & Şimşek, 2013). In using document analysis technique, reliability criteria come to the fore as the criterion of objectivity and adherence to the content of documents. As the most basic requirement in providing these criteria, it is recommended that

more than one researcher be involved in the analysis process, so that the coding process can be verified in this way (Wach & Ward, 2013). Therefore, both of the researchers analyzed the data, assigned codes and formed themes (competence domains) independently. Then, they got together and negotiated over the findings. In this regard, the reliability formula proposed by Miles and Huberman (1994) was used to determine the consensus among the coders. As a result of the calculations, it was found to be 92%. Since it is expected that the consensus between the coders must be at least 80% (Miles & Huberman, 1994; Patton, 2002), it was concluded that the coding was consistent.

In addition, researchers read and examined the documents more than once and conducted the data analysis over a long period of time in a way to reduce their subjective perceptions. Thus, possible biases were tried to be minimized and it was aimed to develop the categories and present the similarities and differences by adhering to the content of the TCFs. Also, researchers consulted with a field expert (a professor working at Curriculumn and Instruction department of a state university) and got feedback about the research including research questions, sample selection, data collection method, data analysis and reporting the results.

Finally, the whole research process (sample selection, data collection, data analysis processes and how the researchers reached the findings) was explained in detail. Sample core competences and sample competency descriptors were presented in "*Appendices*" to ensure research transparency, which enables readers access to the evidence or data used to support empirical research claims.

Ethical Approval

Ethical approval is not applicable, because this article does not contain any studies with human or animal subjects.

FINDINGS

Findings for Research Question-1

In line with the first research question, key components, such as; main competency domains, core competences, competency descriptors and layout (design) of TCFs of sample countries were examined. First of all, the main competency domains of each country were presented in Table 2 and the other components were explained the following paragraphs.

Table 2.
Main Competency Domains

	Singapore	Hong Kong	Canada	Estonia	Türkiye
1	Professional Practice	Teaching And Learning	Ethical Standards	Mandatory Competences	Professional Knowledge
2	Leadership & Management	Student Development	Standards of Practice	Optional Competences	Professional Skills
3	Personal Effectiveness	School Development		Recurring Competences	Attitudes and Values
4		Professional Relationships and Services			

As seen in Table 2, Singapore's TCF has three main competency domains and it has seven core competences. In addition, there are a good number of competency descriptors for each core competence, so it can be suggested that Singapore's teacher competences have been clearly defined in details. In other words, all the stakeholders including teacher candidates can find out what teachers in Singapore are expected to know and to be able to do.

When it comes to Hong Kong's TCF, it can be seen that there are four main competency domains. Also, there are four core competences under each of these domains, which makes 16 core competences in total. In addition, there are six core values that support the whole framework such as; love and care for students, respect for diversity, collaboration and so on. Moreover, it can be argued that Hong Kong's TCF

has the most detailed descriptors for each competency, since it explains the competences in five different levels starting from "threshold" to "accomplished". In this way, it is possible for teachers to evaluate themselves by considering their own level of proficiency for each competency.

Canada's (Ontario College of Teachers) TCF has two main competency domains. There are four core competences under "Ethical Standards" competence domain and five core competences under "Standards of Practice" competence domain. It can be argued that the descriptions for these core competences are quite short and less detailed than other frameworks examined in this study. It should be added that, Ontario College of Teachers (2016) developed "Professional Learning Framework for the Teaching Profession" document can be linked to its TCF. It contributes to teachers' professional development through a great number of learning opportunities.

When it comes to Estonia's TCF, it was seen that, unlike other countries, it does not have main competency domains. It has mandatory competences, optional/elective competences and recurring competences which can be considered as main competency domains. It can be argued that there are a good number of descriptors under all these core competences. Therefore, it can be suggested that teacher competences were explained in a detailed way.

Finally, Türkiye's TCF consists of three main competency domains and 11 core competences. One can find a short explanation about the scope of each main competency domain and core competences. In addition, there are a good number of competency descriptors for each core competence. It can be suggested that Türkiye's teacher competences were presented and explained quite clearly.

Findings for Research Question-2

In line with the second research question, content of core competences and competency descriptors were examined in detail to reveal the similarities and differences among sample countries' TCFs. Firstly, as for similarities, it was seen that although the namings of main competency domains are quite different among the countries' TCFs, the teacher competences which are in common in all sample high-achieving countries' TCFs can indeed be classified into three main domains. Hence, titles suggested by the authors for the in common main competency domains are as follows; i) Professional Knowledge and Practice, ii) Professional Development and Collaboration, iii) Student Development. On the other hand, it was seen that there are some main competency domains which are not available in all sample countries' TCFs. Therefore, these main competency domains were classified as "differences". Similarities and differences among sample countries' main competency domains in their TCFs were presented in Table 3. Also, core competences and sample competency descriptors revealing these overall findings were presented as Appendices.

Table 3.

Similarities and Differences among Sample Countries' TCFs

		Singapore	Hong Kong	Canada	Estonia	Türkiye
Similarities	Professional Knowledge and Practice	✓	✓	✓	✓	✓
	Professional Development and Collaboration	✓	✓	✓	✓	✓
	Student Development	✓	✓	✓	✓	*
Differences	Collaboration with Parents	✓	✓	--	✓	*
	Norms	✓	✓	--	--	✓
	Techno-pedagogical Skills	--	--	--	✓	--
	Supporting the Learners with Special Educational Needs	--	--	--	✓	--

*(✓Available, *****Partially available / not detailed, --Missing / doesn't exist)*

As seen in Table 3, it was observed that all the sample high-achieving countries have a number of core competences which require having a good command of subject matter knowledge and being equipped with pedagogical skills to plan, organize and support students' learning in the most efficient way. Thus, this domain was named as "*Professional Knowledge and Practice"*. It was also seen that various aspects of this main competency domain are available in Türkiye's TCF in a detailed way. Moreover, it can be suggested that two (*Professional Knowledge, Professional Skills)* out of three main competency domains in Türkiye's TCF can be classified under this main domain. Therefore, it can be argued that qualities stated under this domain in high-achieving countries' TCFs have an important place and are given great importance in Türkiye's TCF, as well. Core competences and sample competency descriptors of this domain can be seen in Appendix-1.

Secondly, it was revealed that all sample high-achieving countries in PISA have competency descriptors related to teachers' continuous professional development by employing various methods and sources both in the school and beyond the school individually or within in a group, so these competency descriptors were classified as "*Professional Development and Collaboration"*. It can be suggested that Singapore and Hong Kong put much more emphasis on this issue since they have more detailed and multifaceted descriptors. It was seen that Türkiye's TCF has one core competence called "Personal and Professional Development" which entails professional development of teachers just as in other countries' TCFs examined in this study. In addition, this core competence emphasizes personal well-being and development of teachers, which is not stated in sample high-achieving countries' TCFs specifically. As for the collaboration part of this main domain, Türkiye's TCF includes a core competence named as "Communication and Cooperation" which points out establishing effective communication and cooperation with students, colleagues, families, and other stakeholders. Core competences and sample competency descriptors of this domain can be seen in Appendix-2.

Thirdly, it was found that all sample high-achieving countries have some core competences and competency descriptors about supporting student development as a whole. Therefore, the third main competency domain was named as "*Student Development"* which is largely about being aware of students' diverse learning needs and preferences, supporting students' whole person development (i.e. cognitive, physical, moral, emotional and social well-being), having a close relationship with them and respecting students' varied backgrounds. It can be said that especially Hong Kong and Canada give great importance to this issue since their TCFs have a number of quite detailed competency descriptors related to student development. Also, it was observed that although Singapore has just one core competence about student development, the descriptors are quite detailed. It was seen that Türkiye's TCF includes one core competence on student development but the competency descriptors are not as detailed as in other countries' TCFs. Therefore, it can be argued that Türkiye's TCF shows similarities to high-achieving countries TCFs in this regard to some extent. Core competences and sample competency descriptors which are classified into student development domain in this study are presented in Appendix-3.

When it comes to the differences among TCFs of sample top-performing countries, it was seen that there are some core competences which are not available in all sample countries' TCFs. In this respect, it was seen that Singapore and Hong Kong have some distinct core competences which could be named as "*Collaboration with Parents"*. Thanks to these core competences, both professional development and collaboration are taken into consideration in a broad sense beyond the school and teaching community. In this sense, collaboration with parents is quite different from collaboration with colleagues, directors, academicians and so on. It should be noted that Estonia has also some competency descriptors which require establishing a relationship and communication with parents even though it is not stated as a distinct core competence as clearly as in Singapore and Hong Kong's TCFs. Finally, it can be understood that Canada's (Ontario College of Teachers) TCF does not include any core competences or competency descriptors about collaboration with parents. As for Türkiye's TCF, it was seen that it has just one competency descriptor under the "Communication and Cooperation" core competence. Therefore, it can be argued that collaboration with parents is not explained in a detailed way in Türkiye's TCF as in other high-achieving countries' TCFs. Core competences and sample competency descriptors about collaboration with parents can be seen in Appendix-4.

Another difference among TCFs of sample top-performing countries is that Singapore and Hong Kong's TCFs have core competences about being aware of both written and unwritten rules about the

system and community such as responsibilities, policies and procedures. These core competences can be classified under a separate domain called as "*Norms"*. It should be added that Hong Kong's TCF takes a step further in this issue and it includes core competences requiring contributions to even formulation of policies and procedures. Also, its core competences which can be classified under this domain are quite multifaceted. It was seen that, Türkiye's TCF also includes core competences specifically on both written and unwritten rules about teaching profession under different domains. As a result, it was found that Türkiye's TCF shows similarities to other two top-performing countries' TCFs in this regard. Core competences and sample competency descriptors about this domain can be seen in Appendix-5.

Another difference among TCFs of sample top-performing countries is that Estonia has a specific core competence called as *"Application of Digital Pedagogy"* as one of the optional competences. As its name suggests, it is about using technological tools and digital resources for teaching, which can be associated to "teachers' techno-pedagogical skills" for 21st century. In addition, there are a number of competency descriptors about benefiting from technology under various core competences. Therefore, it can be suggested that Estonia gives great importance to this aspect of teacher training in its TCF. In this sense, it can be argued that it is quite surprising that such core competences or competency descriptors are missing in other sample top-performing countries' TCFs in today's technology driven world. As for Türkiye's TCF, it was seen that it does not include any core competences or competency descriptors related to benefiting from technological tools, programs or applications. Core competences and sample competency descriptors about teachers' techno-pedagogical skills in Estonia's TCF can be seen in Appendix-6.

Finally, Estonia's TCF includes an "optional" core competence called as *"Learners with Special Educational Needs",* which does not exist in other sample top performing countries' TCFs. This core competence includes awareness of applying the principles of inclusive education and adjusting almost the whole education process for learners with special educational needs. In other words, teachers are expected to be able to design and follow a special curriculum for these students. It was seen that, Türkiye's TCF does not include any core competences or competency descriptors related to this issue. Sample competency descriptors of this core competence in Estonia's TCF can be seen in Appendix-7.

DISCUSSION and CONCLUSION

As result of the study, it was concluded that there are some differences in sample countries' TCFs in terms of design, naming of main competency domains, number of main competency domains and core competences, how detailed the competences are explained and which certain competences are emphasized more. On the other hand, it can be suggested that there are significant similarities in required qualities (knowledge and skills) stated as core competences and competence descriptors. In other words, it can be argued that even though there are some differences in sample countries' TCFs, they bear similarities in their essence to a great extent. Akın and Sözen-Özdoğan (2021) reached a similar conclusion in their study which compared Singapore, Hong Kong and Türkiye's teacher competences.

This study revealed that subject matter knowledge and pedagogical skills, teachers' continuous professional development and collaboration, and supporting student development are the in common competences in all sample high-achieving countries' TCFs including Türkiye. This result indicates that these competences have an important place in teacher education systems of the mentioned countries and great importance is attached to the improvement of these competences. This is not a surprising result since research indicates that the effects of well-prepared teachers on student achievement can be stronger than the influences of student background factors (Darling-Hammond, 2000) and subject matter knowledge, pedagogical skills and teachers' continuous professional development are the most essential and required competences to be a qualified teacher (Darling-Hammond, 2006b). Teachers need to have a good command of subject matter knowledge and necessary pedagogical skills to be able to teach this subject matter knowledge effectively. In their study, Hattie and Anderman (2012) concluded that what teachers know, do and care about have a major impact on students' academic performance. Out of the nine factors that have been found to affect student progress, the teacher and their methods of instruction are particularly noteworthy. Also, a continuous professional development is a must to develop and maintain high quality teachers (OECD, 2010) and there is a strong link between teacher professional development and quality of education (Cho et al., 2021). It is emphasized that teachers' participation in professional development activities is an essential component of high-quality teaching (Borko et al., 2010; Hawley & Valli, 1999). In

addition, Postholm (2012) conluded that both national and international research suggests that co-operation with other teachers and the school administration is the best way for teachers to develop their own teaching which in turn fosters students' learning.

All sample high-achieving countries including Türkiye have a place for student development in their TCFs. However, it was seen that the competency descriptors on student development in Türkiye's TCF are not as detailed as in other countries' TCFs. Today's education systems should cultivate individuals not only with adequate academic knowledge but also with the necessary skills of this century. Having individuals who are physically, emotionally, and psychologically strong and independent learners, can think effectively, know what they learn and why they learn have become one of the most essential goals of modern education systems (Schleicher, 2016; Wagner, 2010). In line with the trends in the world, it has become a necessity for countries to restructure their education systems in a way that will encourage the development of 21st century skills such as problem solving, critical thinking, communication, respect for cultural differences, and the ability to develop cooperation (MEB, 2017). This increasing demand can be shown as a possible reason why student development has found a place for itself in all sample high-achieving countries and Türkiye's TCFs. Besides, respecting students' varied backgrounds is highly emphasized in Singapore, Hong Kong, Estonia and Canada's TCFs since these countries have diverse populations in terms of ethnicity, culture and religion. Türkiye has also received a great number of individuals from different countries and cultures in recent years, so the multiculturalism dimension in Türkiye's TCF may need to be improved so as to meet the needs of this change.

This study has also showed that although there are certain similarities across the general competences in all sample countries' TCFs, there are also some differences among the TCFs of sample countries. It was seen that all sample countries excluding Canada have some distinct core competences which could be named as *Collaboration with Parents* in their TCFs although collaboration with parents is not explained in a detailed way in Türkiye's TCF as in other high-achieving countries' TCFs. Also, Singapore, Hong Kong and Türkiye have some core competences which can be classified under a separate domain called as *Norms*. However, the other two sample countries, Estonia and Canada, do not have any core competences related to *Norms*. These small differences can be explained by cultural differences among these countries because desired teacher competences are tied to and affected by each country's historical and cultural contexts, values and educational philosophies (European Commission, 2013; MoNE, 2017). Comparative education enables to learn about other countries' cultures and educational principles and also gives the opportunity to assess our own culture and educational values (Kubow & Fossum, 2007).

One of the most prominent results of this study is that Estonia differs from other sample countries with its two core competences, namely, "application of digital pedagogy" and "learners with special educational needs". The first core competence refers to using technological tools and digital resources for teaching which can be related to techno-pedagogical skills while the second one is about increasing the awareness of applying the principles of inclusive education and adjusting almost the whole education process for learners with special educational needs. This result is important because only Estonia has some core competences related to these two hot topics of 21st century although they are really important in today's world. The rapid development of technology has caused an important change in all fields including education and inclusion of technology in education systems has been highly demanded today because it can be argued that using technology in education improves the quality of it (Koehler & Mishra, 2005). However, the most important thing here is not the technology itself but technology-enhanced pedagogy. In today's world, knowing about the technology is not enough and teachers need to be well-informed how to use technology-enhanced pedagogy in class to improve the effectiveness of their teaching. Techno-pedagogical skills, which include three different domains of content, pedagogy, and technology, are about the using of technology to make teaching/learning process more effective and to reach the educational goals (Dangwal & Srivastava, 2016). However, this study showed that there is a big difference regarding these important competences of today's world between Estonia and the other sample countries.

It can be said that absence of Techno-pedagogical skills in other sample countries' TCFs probably stems from the publication year of the TCFs. Especially, Hong Kong's TCF was published in 2003 and Singapore's TCF was published in 2009, which can be considered as quite old. Ontario and Türkiye's TCFs were published in 2016 and 2017, respectively. On the other hand, Estonia's current TCF was published in 2020. Therefore, it can be suggested TCFs should be updated at regular intervals (e.g. every 5 years) to

include competences required in today's rapidly ever-changing world and so to adapt the changing demands of the both individuals and society resulting from the developments in almost every aspect of our lives. Darling-Hammond (2006a) argues that teacher education is a broad and dynamic field, so qualities of competent teachers vary greatly in time. Today, teachers are required to address diverse groups of students and to teach them quite complex course content. In order to prepare teachers who are capable of dealing with the challenges of the ever-evolving society, teacher education has to be updated in accordance with the recent developments and trends (Ifunanya et al., 2013).

It can be concluded that the sample countries' TCFs have certain similarities across the general competences while there are also some differences among them. Also, it was seen that Türkiye's TCF shows similarities to sample top-performing countries' TCFs to a great extent. However, it is important that the outcomes of Turkish education system are not as satisfying as the other sample countries and the place of Türkiye is far behind the other countries in terms of some international examinations like PISA. Dede and Atanur-baskan (2011) argued that a nation's geographic, ethnic and religious composition, its political system and its educational, economic, demographical, political, and cultural factors all have an impact on the structure and course of its educational system. Because of the distinctive cultural, social, and political circumstances and values of each nation, applying a strategy from one nation in another is probably not going to be as successful. Therefore, it should be noted that there are a great number of factors affecting success of a country's education system and determining the teacher competences is only one of them. Similarly, Epstein (1983) stated that the same application may produce different results under various settings. Accordinly, it can be argued that the level of implementation of these teacher competences may vary across countries. As a result, implementing these teacher competences in teacher education systems should be carefully planned and monitored by all responsible stakeholders. It should be assured that pre-service teacher training programs are capable of equipping the prospective teachers with these competences. With this aim, the Ministry of National Education, the Council of Higher Education and universities must be in cooperation and support each other in terms of organizing the teacher education system.

REFERENCES

Abbasioğlu, E. (2017). *A comparative study of teacher training and appointment system in Japan, Finland and Turkey.* [Master's thesis, Yıldız Technical University]. Turkish National Thesis Center.

Aboyi, E. A. (1997). Financing technical education in Nigeria: issues and trends. *National Conference of the School of Vocational and Technical Education OJU*, 9-11 July.

Advisory Committee on Teacher Education and Qualifications. (2003). *The teacher competencies framework and the continuing professional development of teachers.*

Akgül, M. (2017). *A comparative analysis of teacher education and appointment policies/systems based on PISA examinations.* [Master's thesis, Gaziantep University]. Turkish National Thesis Center.

Akın, S., & Sözen-Özdoğan, S. (2021). Generic teacher competencies: the building blocks in Turkey, Singapore, and Hong Kong. *Ankara University Journal of Faculty of Educational Sciences*, *54* (1), 269-312. https://doi.org/10.30964/auebfd.642519

Atar, H. Y. (2014). Multilevel effects of teacher characteristics on TIMSS 2011 science achievement. *Education and Science, 39*(172), 121-137.

Avcı, B., & Yücel-Toy, B. (2018). Comparison of Norwegian and Turkish education systems and teacher training systems. *Mediterranean Journal of Educational Research*, *12*(25), 39 - 59. https://doi.org/10.29329/mjer.2018.153.3

Barber, M., & Mourshed, M. (2007). *How the world's best-performing schools systems come out on top?* McKinsey & Company.

Blömeke, S., Olsen, R. V., & Suhl, U. (2016). Relation of student achievement to the quality of their teachers and instructional quality. In T. Nilsen, & J. E. Gustafsson (Eds.), *Teacher quality, ınstructional quality and student outcomes* (pp. 21-50). Springer International Publishing. https://doi.org/10.1007/978-3-319-41252-8_2

Boran-Yılmaz, R., Erden, G., Sarıca, B., Yılmaz, Ö., Berat, G., & Akın, M. (2019). Teachers' training and assignment systems of successful countries in PISA. *Academic Platform Journal of Education and Change, 2*(2), 217-236.

Borko, H., Jacobs, J., & Koellner, K. (2010). Contemporary approaches to teacher professional development. In P. L. Peterson, E. Baker, & B. McGaw (Eds.), *Third international encyclopedia of education* (Vol. 7, pp. 548–556). Elsevier.

Büyüköztürk, Ş., Çakmak, E. K., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2012). *Scientific research methods.* PEGEM Akademi.

Can-Aran, Ö. & Derman, İ. (2020). An investigation of science teacher education program in terms of science competencies of different countries. *Erzincan University Journal of Education Faculty, 22*(3), 723-749. https://doi.org/10.17556/erziefd.661722

Cho, M.H., Lim, S., & Hwang, H. (2021). Teacher professional development: Approaches and lessons from a pilot study in Ethiopia. *The Teacher Educator, 51*(1), 25-42. https://doi.org/10.1080/08878730.2020.1767743

Çınar, K., & Dogan, C. (2019). An analysis of Turkish, German and Finnish teacher training systems. *International Journal of Karamanoglu Mehmetbey Educational Research, 2*(2), 204-218.

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). Routledge Falmer. https://doi.org/10.4324/9780203029053

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: techniques and procedures for developing grounded theory* (3rd ed.). Sage Publishing. https://doi.org/10.4135/9781452230153

Dangwal, K. L., & Srivastava, S. (2016). Digital pedagogy in teacher education. *International Journal of Information Science and Computing, 3*(2), 67-72. https://doi.org/10.5958/2454-9533.2016.00008.9

Darling-Hammond, L. (2000). Teacher quality and student achievement: a review of state policy evidence. *Education Policy Analysis Archives, 8*(1), 1-44. https://doi.org/10.14507/epaa.v8n1.2000

Darling-Hammond, L. (2006a). Constructing 21st century teacher education. *Journal of Teacher Education, 57* (3), 300-314. https://doi.org/10.1177/0022487105285962

Darling-Hammond, L. (2006b). *Powerful teacher education: lessons from exemplary programs.* Jossey-Bass.

Darling-Hammond, L., Wei, R., & Andree, A. (2010). *How high-achieving countries develop great teachers.* Stanford Center for Opportunity Policy in Education. http://www.oup.hu/howhigh_doug.pdf

Dede, S., & Atanur-Baskan, G. (2011). Theoretical basis of comparative education and suggestion of a model: comparative education council in Turkish education system. *Procedia - Social and Behavioral Sciences, 15*, 3536-3542. https://doi.org/10.1016/j.sbspro.2011.04.331

Durand, T. (1998). Forms of incompetence. In *Proceedings of the fourth International Conference On Competence-Based Management.* Norwegian School of Management.

Epstein, E. H. (1983). Currents left and right: Ideology in comparative education. *Comparative Education Review, 27*(1), 3-29.

Erdem, A. R. (2015). The [A], [U] and [C] of teacher training in Turkey. *Journal of Teacher Education and Educators, 4* (1), 16-38.

European Commission. (2013). *Supporting teacher competence development for better learning outcomes.* http://ec.europa.eu/dgs/education_culture/repository/education/policy/school/doc/teachercomp_en.pdf

Gläser-Zikuda, M., & Fuβ, S. (2008). Impact of teacher competencies on student emotions: a multi-method approach. *International Journal of Educational Research, 47*(2), 136-147. https://doi.org/10.1016/j.ijer.2007.11.013

Göçen-Kabaran, G., & Görgen, İ. (2016). Comparative analysis of teacher education systems in South Korea, Hong Kong, Singapore and Turkey. *Bartın University Journal of Faculty of Education, 5* (2), 478-495. https://doi.org/10.14686/buefad.v5i2.5000171265

Gül, A. C. (2016). Comparison of teacher training and selection systems of Turkey, China, Finland, Japan and the Netherlands. *Adnan Menderes University Faculty of Education Journal of Educational Sciences, 7*(2), 63-72.

Gültekin, M., & Özenç-İra, G. (2019). Classroom teacher training systems in the United States, Japan, Singapore and Finland. *International Journal of New Trends in Arts, Sports &Science Education*, *8*(4), 126-140.

Hattie, J. (2009). *Visible learning meta-study.* Routledge. https://doi.org/10.4324/9780203887332

Hattie, J., & Anderman, E. M. (2012). *International guide to student achievement.* Taylor and Francis. 2012.

Hawley, W., & Valli, L. (1999). The essentials of effective professional development: A new consensus. In L. Darling-Hammond, & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 127–150). Jossey-Bass.

Haycock, K. (1998). Good teaching matters: How well-qualified teachers can close the gap. *Thinking K-16, 3*(2), 3–14.

Heck, R. H. (2009). Teacher effectiveness and student achievement: Investigating a multilevel cross-classified model. *Journal of Educational Administration, 47*(2), 227-249. https://doi.org/10.1108/09578230910941066

Ifunanya, A. N., Ngozi, O. C., & Roseline, I. I. (2013). Teacher education as a viable tool for national development. *Journal of Educational and Social Research, 3* (8), 69-74. https://doi.org/10.5901/jesr.2013.v3n8p69

İş, E. (2017). Comparison of preschool education and teacher training and appointment policies between Turkish education system and Finnish education systems. *Artuklu Human and Social Sciences Journal, 2*(1), 60-70.

Kalkan, A. (2021). Comparative analysis of the teacher training programs in Turkey and some developed countries. *International Journal of Karamanoglu Mehmetbey Educational Research, 3*(1), 1-16. https://doi.org/10.47770/ukmead.878302

Kaplan, L. S. & Owings, W. A. (2001). Teacher quality and student achievement: Recommendations for principals. *NASSP Bulletin, 85*(628), 64-73. https://doi.org/10.1177/019263650108562808

Koehler, M. J., & Mishra, P. (2005). What happens when teachers design educational technology?: The development of technological pedagogical content knowledge. *Journal of Educational Computing Research, 32*(2), 131-152. https://doi.org/10.2190/0EW7-01WB-BKHL-QDYV

Kubow, P. K., & Fossum, P. R. (2007). *Comparative education exploring issues in international context.* (2nd ed.). Pearson.

Larsen, M. (2010). Troubling the discourse of teacher centrality: a comparative perspective. *Journal of Education Policy, 25*(2), 207-231. https://doi.org/10.1080/02680930903428622

McClelland, D. C. (1973). Testing for competence rather than for "intelligence". *American Psychologist, 28*(1), 1-14. https://doi.org/10.1037/h0034092

Mete, Y. A. (2013). Teacher education and appointment policies in New Zealand, South Korea, Japan and Finland. *Journal of Turkish Studies, 8*(12), 859-878. https://doi.org/10.7827/TurkishStudies.5916

Miles, M, B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook.* (2nd ed). Sage.

Ministry of National Education. (2017). *General Competencies for Teaching Profession.* Ankara.

National Policy on Education. (1986). *Government of India, Ministry of Human Resource Development.* http://mhrd.gov.in/sites/upload_files/mhrd/files/document-reports/NPE-1968.pdf

National Institute of Education. (2009). *TE21: A teacher education model for the 21st century: A report by the National Institute of Education, Singapore.* https://www.nie.edu.sg/docs/default-source/te21_docs/te21-online-version---updated.pdf?sfvrsn=2

Nessipbayeva, O. (2012). The competencies of the modern teacher. *Proceedings of 10th Annual Meeting of the Bulgarian Comparative Education Society*, Bulgaria.

Occupational Qualification Standard. (2020). *Occupational qualification standard for secondary education teachers* (EstQF Level-7). Accessed from https://www.kutseregister.ee/ctrl/en/Standardid/vaata/10824233

Ontario College of Teachers. (2016). *Professional learning framework for the teaching profession.*

Ontario College of Teachers. (2022). *Standards for the teaching profession.* https://www.oct.ca/-/media/PDF/Standards%20Poster/OCTStandardsFlyerENPUBLISH.pdf

Orakçı, Ş. (2015). An analysis of teacher education systems of Shanghai, Hong Kong, Singapore, Japan and South Korea. *Asian Journal of Instruction, 3*(2), 26-43.

Organization for Economic Cooperation and Development. (2005). *Teachers matter - Attracting, developing and retaining effective teachers.* OECD Publishing.

Organization for Economic Cooperation and Development. (2013). Synergies for better learning: an international perspective on evaluation and assessment. *OECD Reviews of Evaluation and Assessment in Education*. OECD Publishing.

Organization for Economic Cooperation and Development. (2015). *Education policy outlook 2015: Making reforms happen.* OECD Publishing.

Organization for Economic Cooperation and Development. (2010). *Teachers' professional development: Europe in international comparison: an analysis of teachers' professional development based on the OECD's Teaching and Learning International Survey (TALIS)*. OECD Publishing.

Organization for Economic Cooperation and Development. (2018a). *Education at a glance 2018: OECD indicators.* OECD Publishing.

Organization for Economic Cooperation and Development. (2018b). *PISA-2015 results in focus.* OECD Publishing.

Organization for Economic Cooperation and Development. (2019a). *PISA 2018 assessment and analytical framework.* OECD Publishing.

Organization for Economic Cooperation and Development. (2019b). *PISA 2018 results (Volume-I): What students know and can do.* OECD Publishing.

Özerbaş, M. A., & Safi, B. N. (2022). The comparative examination of the countries that have become successful TIMSS and PISA and the Turkish teacher training systems. *Journal of Kırşehir Education Faculty, 23*(2), 1960-1992.

Pacevicius, J., & Kekyte. (2008). Managerial capacity: Analysis of possibilities and limitations. *Economics and Management: Current Issues and Perspectives*, *4*(13), 50-62.

Pantic, N., & Wubbels, T. (2010). Teacher competence as a basis for teacher education: views of Serbian teachers and teacher educators. *Teaching and Teacher Education*, *26*(3), 694-703. https://doi.org/10.1016/j.tate.2009.10.005

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Sage Publications.

Postholm, M. B. (2012) Teachers' professional development: a theoretical review. *Educational Research, 54*(4), 405-429, https://doi.org/10.1080/00131881.2012.734725

Rajandiran, D. (2021). Singapore's teacher education model for the 21st century (TE21). In F. M. Reimers (Ed.), *Implementing deeper learning and 21st century education reforms* (pp.59-79). Springer. https://doi.org/10.1007/978-3-030-57039-2_3

Saylan, N. (2014). Constantly modified teacher training system. *Proceedings of 3rd Turkish Association of Curriculum and Instruction Conference,* Turkey.

Schleicher, A. (2016). Teaching excellence through professional learning and policy reform: Lessons from around the World. *International Summit on the Teaching Profession*. OECD Publishing. https://doi.org/10.1787/9789264252059-en

Symeonidis, V. (2018). Revisiting the European teacher education area: the transformation of teacher education policies and practices in Europe. *Center for Educational Policy Studies Journal, 8*(3), 13-34. https://doi.org/10.26529/cepsj.509

The National Council for Teacher Education. (1988). *National curriculum framework for teacher education.* NCTE Publications.

Türkoğlu, A. (2015). What is comparative education? In A. Türkoğlu (Ed.), *Comparative education: samples from around the world.(pp.1-5).* Anı Yayıncılık.

Wach, E., & Ward, R. (2013). Learning about qualitative document analysis. *IDS Practice Paper In Brief,*13, 1-10. Institute of Development Studies.

Wagner, T. (2010). *The global achievement gap*. Basic Books.

Yıldırım, A., & Şimşek, H. (2013). *Qualitative research methods in social sciences.* Seçkin Publishing.

Zanella, P., Antonelli, R. A., & Bortoluzzi, S. C. (2017). Assessment of teacher competencies: analysis in the accountancy program at UTFPR. *Revista de Educação e Pesquisa Em Contabilidade*, *11*(2), 146–163. https://doi.org/10.17524/repec.v11i2.1417

APPENDICES

Appendix-1. Professional Knowledge and Practice Domain

Countries	Core competences	Sample Competency Descriptors
Singapore	* Providing Quality Learning of Child * Providing Quality Learning of Child in Co-Curricular Activities * Cultivating Knowledge: - with subject mastery - with analytic thinking - with creative teaching * Understanding and Respecting Others - Resilience and Adaptability	* show strong knowledge of subject matter and related educational issues * have a deep understanding of how pupils learn * develop and provide learning opportunities that develop students with different learning styles * understand the link between the purpose of assessment and the intended learning outcomes * demonstrate a capacity to engage with problems * are tough in spirit, able to persevere in times of challenge
Hong Kong	* Subject Matter Knowledge * Curriculum and Pedagogical Content Knowledge * Teaching Strategies and Skills, Use of Language and Multi-Media * Assessment and Evaluation	* display solid and extensive subject matter knowledge * have an understanding of curriculum design, implementation and improvement * model exemplary teaching strategies and skills * use assessment results consistently to develop programs that improve student learning
Canada	* Professional Knowledge * Professional Practice	* understand learning theory, pedagogy, curriculum * use appropriate pedagogy, assessment and evaluation, resources and technology
Estonia	* Planning of Learning and Teaching Activities * Teaching * Knowledge in Subject Field * Pedagogical Content Knowledge	* set short- and long-term learning goals, chooses content and plans activities considering the curriculum * have a command of learning content * know how to teach the learning content in the most effective way to different learners

Türkiye	* Content Knowledge * Pedagogical Content Knowledge * Planning of Education and Teaching * Creating Learning Environments * Managing the Teaching and Learning Process * Assessment and Evaluation	* have an advanced and critical perspective on theoretical, methodological and factual knowledge in subject field * compare and contrast various teaching strategies, methods, and techniques that can be used in teaching of his/her subject area * prepare teaching materials suitable to learning outcomes of the curriculum * ensure effective learning by using appropriate strategies, methods, and techniques * prepare and use assessment and evaluation tools suitable to his/her subject area and stages of growth and development of students

Appendix-2. Professional Development and Collaboration Domain

Countries	Core competences	Sample Competency Descriptors
Singapore	* Cultivating Knowledge: - with reflective thinking - with initiative - with a future focus * Knowing Self and Others - Tuning into self - Exercising personal integrity and legal responsibilities *Winning Hearts And Minds - Developing Others * Working with Others - Working in Teams	* identify strengths and areas for improvement * take initiative to improve his/her professional practices * experiment with and advocate for new practices * are aware of the need for professionalism and maintaining high standards in all aspects of his/her demeanor * take initiative to support peers and colleagues * seek out opportunities for professional collaboration within and beyond the school
Hong Kong	* Collaborative Relationships within the School * Teachers' Professional Development * Education-related Community Services and Voluntary Work	* show active support for and maintain close collaboration with colleagues * share good practices with others * develop close links with the broader community through different channels Core Value (4, 5, 6) - commitment and dedication to the profession - collaboration, sharing and team spirit - passion for continuous learning and excellence
Canada	* Ongoing Professional Learning * Leadership in Learning Communities * Integrity	* recognize the importance of continuous professional development thorough research and collaboration * promote and participate in the creation of collaborative, safe and supportive learning communities
Estonia	* Reflection and Professional Self-Development * Development, Creative and Research Activities	* reflect one´s own work * collect evidence from practice and shares evidence-based knowledge with colleagues * participate in learning communities and collaboration networks in developing the knowledge of the study field
Türkiye	* Personal and Professional Development * Communication and Cooperation	* make a self-evaluation by taking opinions and suggestions from stakeholders * involve in activities to improve himself both personally and professionally * open to sharing knowledge and experience with colleagues

Appendix-3. Student Development Domain

Countries	Core competences	Sample Competency Descriptors
Singapore	* Nurturing the Whole Child	* develop a culture of care, trust and friendliness that enhance the wellbeing and character development of pupils * have high expectations of all pupils, respect their varied backgrounds, and are committed to their development as learners
Hong Kong	* Students' Diverse Needs in School * Rapport with Students * Pastoral Care for Students *Students' Different Learning Experiences	* identify and support students' diverse needs * build trust and rapport with students * whole person development of students * Core Values (1, 2, 3) - belief that all students can learn - love and care for students - respect for diversity
Canada	* Commitment to Students and Student Learning * Care * Respect * Trust	* are dedicated in their care and commitment to students. * show compassion, acceptance, interest and insight for developing students' potential. * respect human dignity, emotional wellness and cognitive development.
Estonia	* Supporting the Learner * Motivating	* are aware of the foundations and cultural specialties of the physical, cognitive, emotional and social development of the learner * recognize the learners´ need for support and their individual study needs *…study opportunities how to support the learner´s holistic development and preparedness to learn
Türkiye	* Approach to Students	* value every student as a human being and individual * advocate that every student can learn

Appendix-4. Collaboration with Parents

Countries	Core competences	Sample Competency Descriptors
Singapore	* Partnering Parents	* build collaboration and partnership with parents to maximize the learning of pupils * use strategies to keep parents informed on the progress of pupils and school activities
Hong Kong	* Home-School Collaboration	* have an understanding of students' family backgrounds * provide information to parents frequently on both positive and negative aspects of student progress * involve parents in the school's decision making whenever appropriate with the aim of continuous school development
Estonia	* Collaboration and Instruction	* create a trustworthy relationship with the learner and parents * give feedback about learner progress to learner and parents * include parents actively into making decisions connected to learner development and applying them
Türkiye	* Communication and Cooperation	* cooperate with families in educational activities

Appendix-5. Norms Domain

Countries	Core competences	Sample Competency Descriptors
Singapore	* Understanding the Environment * Understanding and Respecting Others	* are aware the rationale for national education policies and practices and their infusion * demonstrate sensitivity to cultural and religious differences
Hong Kong	* School's Vision and Mission, Culture and Ethos * Policies, Procedures and Practices * Involvement in Policies Related to Education * Responsiveness to Societal Values and Changes	* adapt, carry out and contribute to school vision and mission * understand and implement school goals and policies * have knowledge of policies related to education
Türkiye	* Knowledge of Legislation * National, Moral and Universal Values	* account for the legislation related to teaching profession * respect individual and cultural differences * respect child and human rights

Appendix-6. Techno-pedagogical Skills Domain

Countries	Core competences	Sample Competency Descriptors
Estonia	*Application of Digital Pedagogy	* create and compile instructional and methodological materials for applying digital tools * enhance the usage of digital tools in teaching in collaboration with teachers within the organization
	*Teaching	* use digital technologies for increasing inclusion of learners in learning; * organize meaningful use of digital technologies in class/group during individual and collaborative study
	* Reflection and Professional Development	* use digital environments for personal professional development
	* Evaluation and Development Of Digital Competences	* evaluate and develop his/her digital competence according to the digital competence model recognized in the education field.

Appendix-7. Supporting the Learners with Special Educational Needs

Countries	Core competences	Sample Competency Descriptors
Estonia	* Supporting the Learners with Special Educational Needs	* recognize the types of special needs of the learners * compile and apply individual study curriculum in one or multiple subjects or applies a different curriculum * apply the recommendations of the counselling team