

Developing A Framework in Higher Education for Teachers/Instructor Roles and Competencies that are Related to the 21st Century: Meta-Analysis

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ABSTRACT

This paper presents a review of relevant studies concerning teachers' competencies. Critical aspects discussed in this chain existing frameworks regarding teachers' role and competencies, skills, knowledge, and attitude in HEI. The research is expected to follow a quantitative research approach in which data was reviewed using meta-analysis. The study presents a non-evaluative reporting of the data using appropriate methods to draw insights. The findings indicated that teaching in HEI requires a variety of critical competencies. Some of these include curriculum development, sociocultural studies, psychological studies, and research. This study provided an opportunity to consider the various competencies that were identified and acknowledged in the literature. The study suggested that most of these could not be tested and used in the learning environment. The goal of identifying competencies was to create a framework that would demonstrate how those with higher levels of knowledge and skills would perform well in a wide variety of occupations.

Keywords: Higher Education for Teachers, Meta-Analysis, Instructor Roles and Competencies.

Introduction

Over the years, the quality of education in Higher Educational Institutions (HEIs) has significantly changed from offering learners different knowledge that to ply later to emphasizing life skills. This change modern society has actualized this change required innovative ways of solving problems and teaching. Additionally, there have been increased calls for more qualified professionals who were culturally knowledgeable, gifted, creative, and resourceful problem-solvers (Kilgore, 2018). This scenario has been created by the need to offer learners specific skills that aid them in working collaboratively, becoming active decision-makers, and overseeing the use of different resources more effectively. As a result, teachers in HEIs need to have clearly defined roles and competencies that could assist them in comprehending the teaching requirements in the 21st century. From this context, it could be deduced that teacher competencies in HEIs form a critical part of the learning process (Qadhi et al., 2020; Chaban, Qadhi & X, 2021).

Before addressing teacher competencies and their specific roles in HEIs, we need to understand what they are composed of. In existing studies, teacher competencies have extensively been utilized in different contexts (Pantić, 2011). From the perspective of teacher education and their job performance, competencies have represented the necessities that must be possessed by an instructor to fulfill their role in competency-based education, such as the skills, knowledge, and values within a classroom environment (Kunter et al., 2013). From this definition, four main features of teacher competencies could be derived, namely: (a) possesses a set of skills for improving one's competency; (b) it should be related to three domains, namely skills, knowledge, and attitude; (c) possesses a performance element that would be recognizable and definite; and (d) it should be observable and quantifiable from the instructor's level of performance.

Other scholars such as Sudirman (2019) have perceived competencies as a set of skills, knowledge, and behavior that could enhance one's performance in a specific role. This was based on the Occupational

Competency movement, instigated by David McClelland in the 1960s that attempted to alter the typical approach of exploring competency in terms of knowledge, skills, and attitudes to concentrating on possessing exceptional skills and expertise in a particular role (Nessipbayeva, 2012). This suggested that the position assumed by the teacher in the learning process should seek to produce learners who could articulate various issues within a multicultural environment.

Instructors need to possess critical competencies to promote effective learning among students concerning their cognitive, psychological status, and psychomotor skills, especially in HEI. This was attributed partly to the fact that the quality of education required by learners could be established from the competencies and roles assumed by teachers during the transfer of knowledge. Furthermore, multiple complexities in modern society have severely hindered an individual's performance in a specific position. A critical question that needs to be evaluated has been how these requirements have influenced teachers' vital competencies to perform their particular function in HEIs. This research was expected to identify the overarching goals that could be used to evaluate a wide range of competencies needed by teachers in HEIs in the 21st century.

To promote effective learning among the students concerning their cognitive, psychological status, and psychomotor skills, especially in HEI, it would be essential for instructors to possess critical competencies. This study was attributed partly to the fact that the quality of education could be established from the instructors' competencies and their specific role in transferring knowledge. As one of the elements in the learning environment, learners desire the electoral effect, which would provide them with an opportunity to learn and improve their skills.

A review of existing studies indicated that there had been no framework provided in the literature that uniquely identifies teachers' competencies about the specific roles they perform in HEIs (Cunningham et al., 2016). This lack of studies was attributed partly to the inability to fully comprehend teachers' professional development curriculum competencies (Selvi, 2010). Additionally, teachers' competencies were changing from time to time based on the specific area of specialization. It would be essential to regularly review teachers' competencies and their particular roles to address the challenges present in the 21st century. Therefore, this study explored the roles and competencies of teachers in HEIs to develop a framework.

Purpose of the Study

The primary purpose of this quantitative study was to explore the roles and competencies of teachers in

Higher Educational Institutions in 21st Century skills to develop a framework that could demonstrate how knowledge, skills, and attitudes could be associated with competencies. The outcome of this study is expected to offer critical insights on competence frameworks that could provide clear roles for teachers to advance attitudes that promote professional development, reflection, and autonomy in teachers' career progression in HEIs. Additionally, this outcome is anticipated to support professional development at the individual and institutional levels by emphasizing learning priorities. It is also expected to contribute to existing literature since there has been no extensive research that has been conducted regarding teachers' competencies in higher education.

Research Questions

This study will address the following research inquiries:

- Q1 What teachers in HEI have employed roles and competencies?
- Q2 How have these roles—and competencies influenced the different instructional delivery models in HEI?

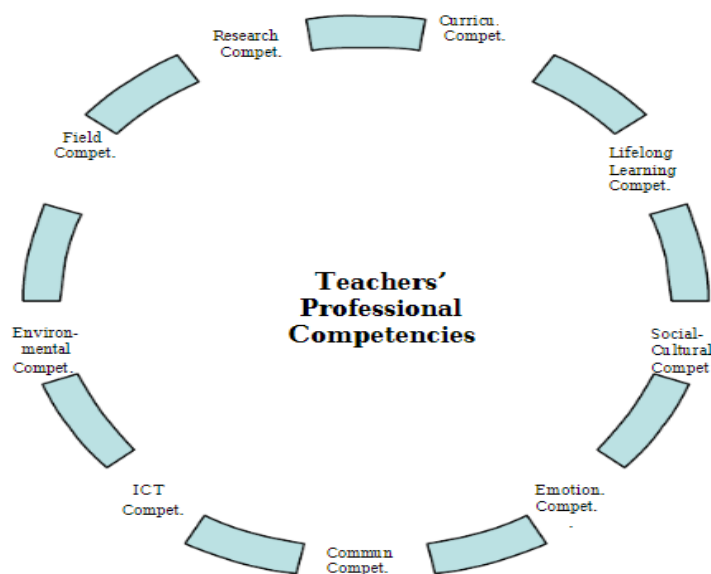
Literature Review

Twenty-first-century competencies are essential to address the modern-day challenges facing teachers attributed partly to innovation in the learning environment. This research has shifted the focus to the construct of new knowledge and developing skills while sustaining the existing ones, which offer opportunities for developing new approaches of thinking and equipping people on how they could *work and develop practical tools* (Binkley et al., 2012).

Teachers' competencies in higher learning institutions have remained mainly undefined or neglected by vital educational stakeholders. As a result, most teachers have faced difficult situations concerning curriculum development and implementing recommended changes in the educational systems. Prior research related to teachers' competencies has offered several frameworks that explain some factors that have influenced the knowledge, skills, and tools required by a teacher to teach in higher learning institutions. For instance, Selvi (2010) developed a general framework that considered nine dimensions of teachers' competencies that impacted the values, conduct, correspondence, and school practices (see Figure 1). Selvi argued that teachers constantly need to enhance their knowledge and skills to improve their teaching practices. Although the study was not restricted to specific types of learning institutions, it exclusively identified the teacher's active role in adopting the

recommended changes into the educational system to achieve effective outcomes (Selvi, 2010).

Figure 1. The main elements that form teacher's professional competencies.



Aliyyah et al., (2020) also sub-divided teacher competencies into seven dimensions: curriculum development, continuous learning, socio-cultural, psychological, correspondence, information communication technology (ICT), and ecological competencies. Apart from these teacher competencies, Selvi (2016) employed the use of the conventional Delphi method to establish competencies of a new teacher and discovered that it was essential for professional teachers to demonstrate effective use of research competencies while performing their roles. This was expected to assist teachers in understanding issues present in the learning environment to use the most appropriate approaches while performing the specific functions. The outcome indicated that teachers' competencies could be classified into four main groups, including curriculum, life-long learning, socio-cultural, and emotional competencies, which ought to be examined in different contexts (Selvi, 2016). Rusilowati (2020) further added that teachers' competencies could be perceived from how they communicate, implying that their language, description, and expression form a significant part of good communication and ability to influence the students.

From a university setting, several studies have been conducted to determine the competencies of teachers. For instance, focused on the competencies for education sustainable development teachers in higher learning institutions Chuang et al., (2020). The study's outcome indicated sub-divided teacher's competencies into three main categories, namely *field*, *didactic* and

cultural competencies, that influence critical thinking, cognitive competencies related to critical thinking, analysis, and problem-solving to determine the leading indicators influencing teachers' performance. However, the rapid changes in technology, economy, and social contexts in the 21st century have resulted in the need to develop new competencies that could assist teachers in achieving their specific roles. These competencies that have been identified in existing literature were based on their capacity to contribute towards achieving learning outcomes

Breeze and Guinda (2017) concentrated on four main competencies associated with a high-quality education in the tertiary institution, using the English language as the main subject to explore its impacts on ingenuity, critical thinking, independence, and drive. The outcome offered an integrated approach that outlined the competencies required by a university teacher who taught the English language while exploring its application to the English curriculum.

One of the roles teachers perform in HEI highlighted in the literature was to improve the quality of teaching. Okolie et al., (2020) discovered that it was essential for teachers in HEI to undergo pedagogical training (PT) apart from their educational training. This was intended to facilitate teaching and learning among teachers. Caena and Redecker (2019) urged the need for instructors to enhance their competence profiles and offered ways to address challenges at the micro, meso, and macro-level in the 21st century. Caena and Redecker further provided the requirements of education

professionals that competence frameworks must address at different levels. Based on the report presented by the [European Commission \(2013\)](#) regarding teachers' competence frameworks, it was noted that it served three main functions: projecting the outcomes from teacher training, the approach that could be utilized for recruiting instructors and determining the professional development requirement for teachers. It further noted that it could offer teachers a clear illustration of their roles which could promote professional development and autonomy for teachers in HEIs.

Methodology

This section presents the procedures and methods used in evaluating teachers' critical competencies while performing their roles in higher education institutions related to 21st century skills. The dynamic nature that was associated with teacher's professional development competencies, especially in HEIs, has rarely been explored in previous studies ([Rusilowati, 2020](#)).

As a result, this quantitative study employed a meta-analysis to explore teachers' competencies and their specific roles. [Mikolajewicz and Komarova \(2019\)](#) described meta-analysis as a quantitative research design approach that was epidemiologically utilized to evaluate the outcome of previous studies to achieve derived assumptions concerning a particular research phenomenon. In this case, a meta-analysis of existing literature studies related to teacher's competencies was expected to provide the dominant factors that teachers in HEIs would require to perform their roles effectively.

Despite the extensive information that could be derived from this research approach, a wide range of scholars have raised several issues related to validity and reliability that ought to be considered with the use of meta-analysis and systematic review in any research. These challenges have contributed significantly to the inability to determine the main competencies required by teachers in HEIs in a different context ([Hammersley, 2020](#)). Additionally, researchers have not come to a consensus on how these aspects could be addressed. This paper considers relevant studies from different electronic research databases and journals that could handle the reliability and validity to address this challenge.

Data Sources and Search Strategies

Relevant studies related to teacher competencies and their specific roles were gathered by searching publicly available studies published in online research databases such as *Google Scholar*, *ResearchGate*, *ERIC*, and *UMI ProQuest Digital Dissertations* from January 2010 to January 2020. In this case, several categories, keywords, and terms were employed during the search, such as *competencies*, *roles*, *HEIs*, and *teachers*. By adopting the use of "AND," the

search terms were expected to disclose the competencies required by teachers while performing their roles in HEIs; how they influenced the instructional delivery model selected in terms of the knowledge, attitudes, and skills. The titles and abstracts of the selected studies were carefully reviewed, and only studies that fulfilled the inclusion criteria were selected for further review.

Inclusion and Exclusion Criteria

The studies that were eligible for this review were required to have fulfilled a set of requirements. These were required to have been: (a) written in English; (b) remained unpublished or presented for publication by January 31, 2010; (c) emphasized on teacher competencies; (d) targeted teachers drawn from higher educational institutions of learning such as universities and colleges; and (e) took into account the use of a control group and reported sufficient information so that the effect size could be quantified. On the other hand, the study excluded studies that had concentrated only on 21st century skills in tertiary level of education and those that focused on teacher competencies in the lower level of instructions such as primary and secondary schools. Additionally, the study excluded programs whose purpose was to enhance students' performance using different types of educational curricula, instructional strategies, or other forms of enhanced teaching that concentrated on teachers' abilities.

Data Analysis

Before analyzing the data, the study examined the methodological quality of the selected papers after screening had been completed using a pre-determined. The list consisted of several questions which evaluated the biasness of the various studies selected. Common inquiries mainly focused on the collection of relevant information concerning competencies and roles of teachers, its relation to the instructional delivery model, and how it influenced students' knowledge, skills, and attitudes, upon which the results were tabulated. This was meant to facilitate the presentation of evidence extracted from the selected studies and offer a summary of the findings.

Ethical Considerations

To prevent due harm from affecting teachers who might provide information, the study had purposely selected the use of meta-analysis of existing studies related to teacher competencies while performing their roles in HEIs. As a result, no confidential data was stored or accessed as part of the research. The study relied on existing studies to determine competencies required by the teacher while performing their roles and how it influenced the instructional delivery model adopted. These studies were based on the inclusion criteria that included peer-reviewed studies related to competencies

and roles of teachers. Thus, the study protected the participants from these studies from undue harm as well as the confidentiality of the author.

Results and Discussion

The study presents the results obtained from the analysis of relevant investigations related to roles and competencies of teachers in higher education institutions in the 21st century skills using meta-analysis. The examination of the existing research and published reports indicated that several aspects emerged in literature, which provided comprehensive information on the roles and competencies of teachers in HEIs. First, we began by presenting the results of the effect size obtained after examining studies conducted. This was intended to understand general characteristics associated with the selected papers on the roles and competencies of teachers in higher education institutions in 21st century skills. The study then examined the competencies and functions performed by teachers in HEI and their effects on instructional delivery. This section concludes with a summary of the findings before presenting a discussion

Effect Size Extraction

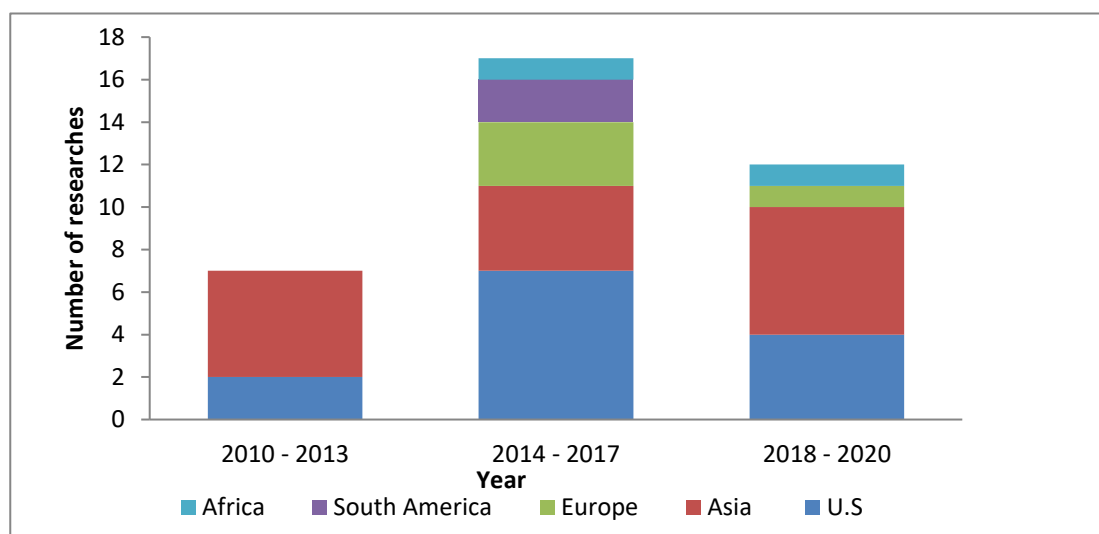
From an aggregate of 36 studies discovered, it was noted that 25 studies illustrated the competencies that were required by teachers that were necessary to perform their specific roles in HEIs. Quantitative analysis was used to examine these studies in order to determine the effect size. From the 25 selected studies, only 14 studies had been conducted with teachers drawn from universities or colleges (Alexander, 2020; Bashir, 2013; Blömeke et al., 2013; Bond et al., 2018; Caena &

Redecker, 2019; Greenhill, 2010; Howard et al., 2019; Kasule, 2015; Keinänen & Kairisto-Mertanen, 2019; León-Pérez et al., 2020; Riley, 2010; Schleicher, 2012; Tuzlukova et al., 2018; Wattanavorakijkul, 2019).

However, five studies were excluded from the meta-analysis on the basis of concentrating on 21st century skills without taking into consideration the competencies and roles of teachers. These studies included Riley (2010), León-Pérez et al., (2020), Alexander (2020), Greenhill (2010), and Tuzlukova et al., (2018). From the computation of the effect size using the 36 studies found, the results indicated an effect size of 9 after it was discovered that 27 studies could not provide sufficient statistical data for effect size computation.

The study also examined the distribution of the studies based on the regions. Figure 2 presents a summary of the distribution of research activities that have been conducted in the different areas regarding the teacher competencies and their specific roles in HEIs. It was generally observed that the majority of the studies conducted between 2014 and 2017 originated from the U.S. On the contrary, it was noted that the Asian region had noted some significant increases in period 2018-2020. In Europe, there was a steady decline in the number of publications related to teacher competencies and their specific roles in HEIs. This could be attributed to increased support for innovation competencies among teachers, where learning and evaluation tended to be performed in an online environment. Other regions, such as Africa and South America, were perceived to remain behind in providing support for teacher competencies and their specific roles as compared to other regions.

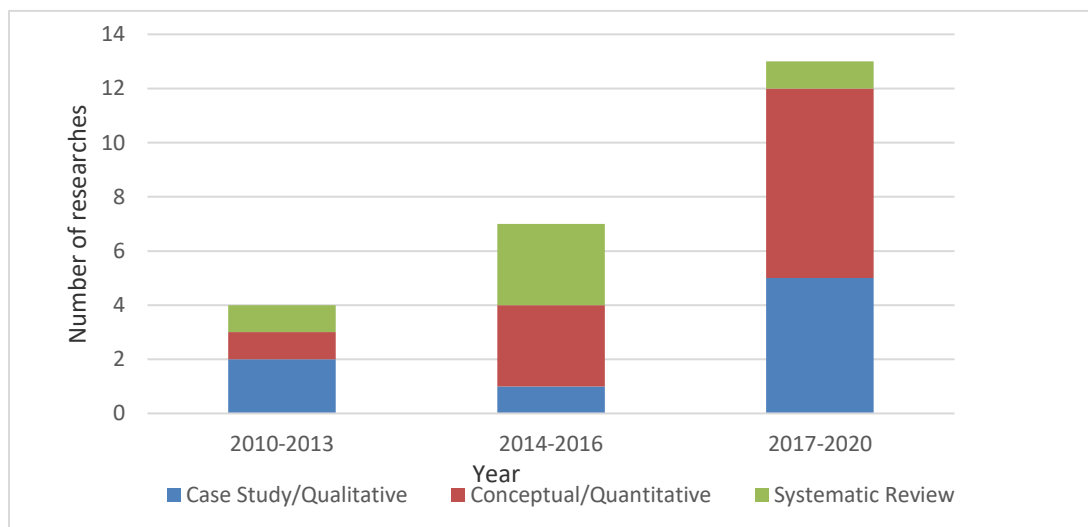
Figure 2: Distribution of studies related to teacher competencies during the period 2010-2020.



The study also categorized the studies into two different types of research that had been conducted, namely conceptual case studies and reviews of existing studies. This was intended to understand how the selected approach had impacted the outcome. Figure 3 presents the classification of the different studies selected. Generally, the results pointed out that most studies adopted a

conceptual/quantitative research approach, while a small number of studies were performed using systematic review of existing studies. Therefore, it was plausible to consider that there was increased technological support for teacher competencies, while performing their teaching role during the period 2018-2020.

Figure 3: Type of studies conducted during the period 2010 – 2020

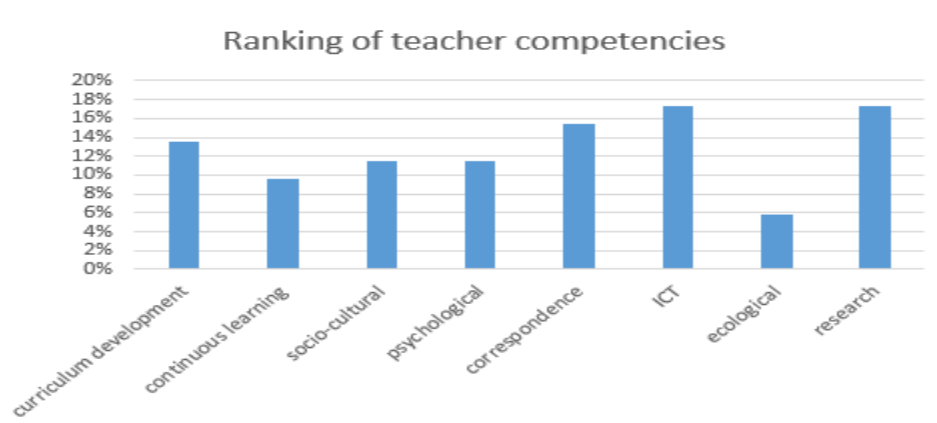


Teacher Competencies in Higher Educational Institutions (HEI)

In this section, the selected studies were examined to determine the specific competencies required by teachers to perform their specific role. Specific competencies that were examined included

curriculum development, continuous learning, socio-cultural, psychological, correspondence, information communication technology (ICT), ecological competencies, and research competencies. Figure 4 presents an illustration of the different teacher competencies based on the selected studies.

Figure 4: Distribution of teacher competencies based on selected studies the title here is different than the one under the shape



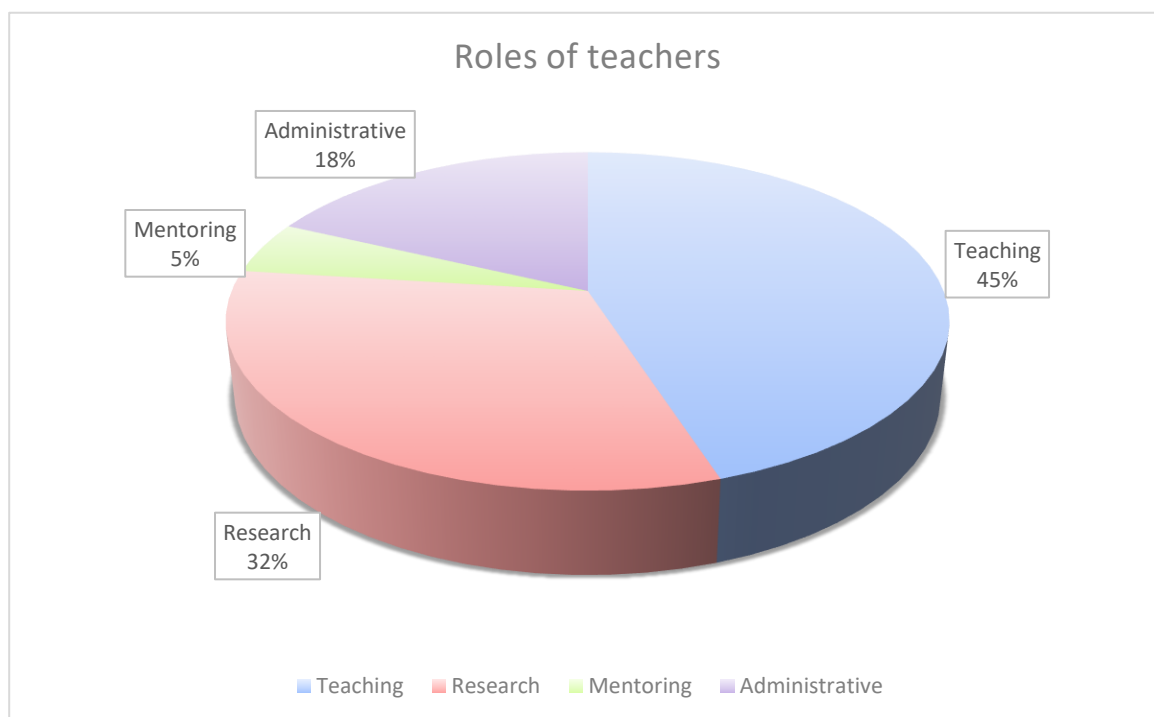
From the results obtained, it was noted that ICT and research (17% each) were the most critical competencies that were required by teachers in HEI in order to perform their roles. This was closely followed by correspondence (15%) and curriculum development (13%). This was consistent with the findings of Selvi (2016), who discovered that it was essential for professional teachers to demonstrate effective research competencies to understand issues present in the learning environment as well as to select the most appropriate approaches for solving problems. On the other hand, the least competence that was required by the teachers in HEI was ecological competencies at approximately 6%. This suggested that the capacity of teachers in HEI to use different innovations to perform research, collect and analyze data, and publish the findings were a key prerequisite.

Roles Performed by Teachers in Higher Educational Institutions

The study also sought to understand the specific roles performed by teachers in HEI based on the selected papers. This was intended to determine

some of the key functions teachers performed while assisting students. A review of the nine selected studies indicated that specific roles performed by teachers included teaching, research, mentoring, and administrative duties as illustrated in Figure 5.

Figure 5: Specific role performed by teachers



From the results obtained, it was noted that the specific role of teachers in HEI was mainly to issue instruction or teach student representing 45%. This was closely followed by research which assist teachers to understand issues present in the learning environment representing 32%. On the other hand, the least role performed by teacher in HEI was mentoring of students representing 5%. This was probably attributed to the busy nature of their work.

Effect of Competencies on the Instructional Delivery

In this section, the study examined the impact of various teachers' competencies on instructional delivery. Quantitative tools to examine how competencies have impacted on instructional delivery in HEI. The results are presented in Table 1.

Table 1
Effect of Competencies

Model		Unstandardized Coefficient	Std. Error	Standardized Coefficient	t	Sig.	Collinearity Statistics	
		B		Beta			Tolerance	VIF
11	(Constant)	67.326	1.493	.723	45.108	.005	1.000	1.000
	Psychological	0.96	5.433	.3811	2.03	.010	1.000	1.000
	Socio-cultural	0.24	9.337	.411	11.01	.000	1.000	1.000
	Communication	7.34	2.093	.925	3.03	.000	1.000	1.000
	ICT	8.28	0.013	.934	15.02	.000	1.000	1.000
	Research	5.068	0.025	.323	2.683	.000	1.000	1.000

^a Dependent Variable: Instructional delivery.

Generally, it was noted that most of the competencies of teachers were positively correlated to the instructional delivery with a positive beta value. ICT ($\beta = 0.934$), communication ($\beta = 0.925$), and curriculum development ($\beta = 0.651$) competencies were observed to possess the largest beta values as compared to socio-cultural ($\beta = 0.411$), psychological ($\beta = 0.381$), and research ($\beta = 0.323$) competencies. This suggested all competencies used by teachers in instruction delivery were expected to have positive outcomes; but with varied outcomes.

Proposed Model for Teacher Competencies in Higher Educational Institutions

Based on the result obtained, it could be deduced that key competencies required by roles included curriculum development, socio-cultural, psychological, correspondence, ICT, and research competencies. In this case, ecological and continuous learning competencies were considered to play an insignificant role in influencing the teacher's role. Therefore, a modified version of the teacher's competencies for HEI was comprised of six key elements (see Figure 5).

Figure 6. A revised model for teacher competencies in Higher Educational Institutions.



It could be deduced that teacher competencies as provided in the revised model above were critical to enabling teachers in HEI to perform the specific role of teaching, research, mentoring, and administrative duties assigned to them. Competency factors such as curriculum development and continuous learning were critical in assisting students in realizing improved performance as well as support self-development. This suggested that curriculum and continuous learning were expected to have a positive impact on the learning progression. In case teachers possessed a higher comprehension of curriculum development and knowledge, this was anticipated to translate to improved academic performance. These findings were consistent with the findings of Bond et al., (2018;) who discovered that classroom management had a positive impact on the quality of student-produced.

Conclusion

The study intended to develop a framework that could best illustrate competencies that were required by teachers in higher education in the 21st century. Using meta-analysis, the selected nine studies provided critical information for the study. The results indicated that critical competencies required by teachers in HEI included curriculum development, sociocultural, psychological, correspondence, ICT, and research competencies. However, these results were restricted to conducting a review of existing studies. This provided an opportunity to understand the competencies needed by most teachers that had been identified and acknowledged in the existing literature. This implied that most of these teacher competencies in HEI have not been tested and tried in the learning environment. The identification of these competencies was intended to provide a critical foundation for the development of a robust framework that could demonstrate how knowledge, skills, and attitudes were associated with competencies. Future research in this area ought to consider a number of areas. First, it would be important to consider conducting a study that relied on primary data that evaluated the reliability of the research instrument employed to get more robust and consistent results concerning competencies and roles of teachers in HEI.

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