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Review Article

Trends of competencies in teacher education from 2015 to 2020: A Systematic Review Analysis

Galih Albarra Shidiq[a], Suppamai Promkaew[a,b], Chatree Faikhamta[a,*]

[a] *Department of Science Education, Faculty of Education, Kasetsart University, Bangkok 10900, Thailand*
[b] *Department of Biology and General Science, Faculty of Education, Valaya Alongkorn Rajabhat University under the Royal Patronage, Pathum Thani 13180, Thailand*

Article Info

Abstract

Teacher competency is a critical component in achieving the educational goals of teachers. The purpose of this systematic review was to understand better the research attributes of teacher education skills as described in the Journal of Teacher Education has published 169 papers. By identifying, critically evaluating, and summarizing all relevant study findings, we examined the trends in authors' and countries' contributions, participants, strategies, and teaching competencies. According to the statistics, the United States contributed the most papers by improving teachers' learning attitudes. Moreover, teacher preparation produced the most significant number of strategies for enhancing teacher education's capabilities, as evidenced by most target groups developing preservice teachers' competencies. In addition, we identified additional domains of teacher education strategies emphasized by several researchers, including the transformation of classroom practice, increased student accomplishment, knowledge of pedagogical content, knowledge of the subject in terms of knowledge and communication skills, interpersonal skills, and outcome-based instructional design skills. These findings suggest that future research should focus on comprehensive teacher preparation, including transforming classroom practice, communication skills, knowledge of pedagogical content, instructional design skills and outcomes, knowledge of the subject, and social communication skills. Their achievement has all improved to be appropriate for 21st-century teaching.

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Introduction

The trend of teacher education for the 21st century has been more concerned with the development of relational skills, both for theoretical and practical knowledge, to improve the identity and ability of teachers in educational institutions, including teacher's education and preparation (Bocala, 2015; Knight et al., 2015). Wiksten (2018) found that a significant issue in teacher education was the criteria and standards used to prepare teachers. These criteria include how the teachers decide

in the teaching process and how they urge their high-order-thinking skills. Therefore, they could be combined by using theoretical courses at the university and practice teaching in the school by improving the quality of teaching, professional development thoughtful, reflective, inquiry-based, and knowledge-based system of education that strives to acquire the equitable opportunity of all (Knight et al., 2015).

Teacher education should emphasize the quality of instruction and how teachers collaborate in the delivery of instruction. For instance, Chong and Cheah (2009) described that Teachers' skills and knowledge, which can be recognized as components and critical values that can be incorporated into the curriculum through growing the value, skills, and knowledge, can be utilized to assess their quality and work. In a similar vein, Medeiros, Ramalho, and Falcão (2018) found that teachers' talents and problem-solving skills, such as pedagogical intervention, performance evaluation, feedback, or reflection of classroom activities, may all reflect their abilities and knowledge. However, Education (2009) explained that value, skills, and knowledge could be following the 21st century's teaching professional criteria by improving teachers' innovation, reflection, mutual respect, personal connection, and collaboration.

Previous studies of the systematic review by O'Flaherty and Beal (2018) concluded the core competencies of teacher education by reviewing 137 papers from 2000 to 2016. They did this review by focusing on the competencies and practices of teacher education, such as teachers' knowledge, attitudes, and skills from the perspective of beginning teachers and in-service teachers in the elementary and secondary levels. Still, this study did not fix more on teacher preparation competencies, such as authors/ countries' contributions that can develop teacher education or components/ strategies. On the other hand, Field (1979) reported that competencies of teacher education could be constructed by knowledge as cognitive skills, attitudes as practical skills, and strategies as a performance of teacher education. Moreover, Dyment and Downing (2020) reviewed 492 papers from 2012 to 2017 and found that competencies of teacher education during this time focused on the analysis of the title and abstract of themes, including the journal of publication, year of publication, research approach, and critical areas. They reported that the competencies of teacher education can be identified as technological-pedagogical innovations and teachers' experiences.

The focus of this journal provided the forum for considering the practice of policy and research in teacher education. Since 1950, this journal has published many papers mainly focusing on and developing teacher education such as a new teacher education standard, assessing the outcomes, preparing teachers, teaching in a global society, and research-based teacher education. Following the series of this journal, the current study aimed to analyze research publications in the Journal of Teacher Education from 2015 to 2020. The systematic review method helps us guide a review outline of ongoing research competencies to development in teacher education and provide actual results for more detailed competencies of teacher education over the last decades. For instance, a recent study from Lin, Lin, Potvin, & Tsai (2019) investigated the authors and countries in the three journals (SE, JRST, and IJSE) since 2013–2017 and found the United States is the most frequent contributor. Besides that, the United States focused on improving the teacher education program/community in research last time.

Additionally, a review study conducted by Pulham & Graham (2018) exposed the issues of the competencies in teacher education and considered whether the research topics are related to the role of pedagogy: pacing, curriculum, choice, scheduling, and diverse learning styles, management skills, assessment, technology, instructional design, dispositions: respect, mindset, and commitment to school opportunities, improvement: concept of improving, evaluating, and reflecting on teacher practice in the period of 2006 to 2015. This analysis reported that the competencies in teacher education should continue to examine the competencies required to integrate the strategies of current standards and practice to be fitted with 21st-century abilities. In contrast, a systematic review of the existing competencies in teacher education is needed to develop teaching and learning strategies in the research. As noted previously, the purpose of this study was to ascertain the trends in teacher education competencies and strategies for obtaining them from the Journal of Teacher Education between 2015 and 2020. The research questions are listed as follows: (1) Which authors and countries contributed the most papers of Journal of Teacher Education in the period 2015–2020?; (2) Who were the most common participants in the research on teacher education?; (3) What were the trends of teachers' competencies in teacher education?; and (4) What were teachers' strategies for the competency of teacher education?

Literature Review

Teachers' competencies are defined as dynamic and complex dimensions that combine attitudes, skills, and knowledge that lead to effective action in the real world (Chong & Cheah, 2009; O'Flaherty & Beal, 2018). It can be demonstrated in the successful level of teachers in performing their duties professionally and appropriately, such as a complex implementation system that covers knowledge and learning and practice skills; attitudes such as motivation, the direction of emotional values (Koster & Dengerink, 2008). The domains of competency have been emphasized in teachers' work quality (Chong & Cheah, 2009). One domain that has become a valuable factor in most research over the last decade is knowledge. An exciting study by Shulman (1987) separated knowledge into knowledge of the subject, general pedagogical knowledge, understanding of pedagogical content, curriculum knowledge, educational context knowledge, educational goal and value of knowledge, learning ability, and characteristics. In a similar focus, Turner and Drake (2016) emphasized the teachers' knowledge into the content and knowledge of pedagogical content, pedagogical innovation, a transformation of classroom practice, and enhanced student attainment by providing the opportunities for teachers to explore, reflect on teaching and create teaching instructed feedback. In addition, Bocala (2015) categorized knowledge into the teachers' individual knowledge and quality of practice, knowledge of pedagogical content, development of high-level literacy, and subject-matter knowledge by developing a design practice instruction to facilitate teachers in the discussion.

In other domains of competency, McKenzie, Neiger, and Thackeray (2009) categorized skills into a part of communication skills: active listening, interpersonal skill, and empowering ways of conducting dialogue; management skills: planning, implementing, and assessing ethical thinking skills, organizational and community communication skills. Recent studies from Leeferink, Koopman, Beijaard, and Ketelaar (2015) also classified skills into social communication skills, development practice and teaching experience, instructional instruction, and teaching activities, socio-cultural skills, and emotional competencies, which influenced teachers' workplace learning and the possibility to learn more by the knowledge which occurs. Furthermore, Coogle, Ottley, Storie, Rahn, and Kurowski-Burt (2020) placed skills into the categories of

competencies and results in instructional design, instructional practice, cultivating collaborative, critical discussions and experiences, and interpersonal skills, which improved teachers' preparation in facilitating students' learning.

On the other hand, attitude is considered a part of competency that involves teachers' willingness in school and community activities (McLaughlin, Hawkins, Brindley, McIntyre, & Taber, 2006). Jenset, Klette, and Hammerness (2018) developed the domain of attitudes into eight dimensions of the conceptual framework of teachers' competencies in teaching and learning: design for teaching and the teacher's character, and then practice and prepare, examine the students' learning, including instructional materials, artifacts, and resources discuss field placements/experiences, student perspectives, teaching approaches, and the connection to national or state curricula. Another study from López (2017) emphasized attitudes into the instructional practice, professionalism, discussions with critical teachers, networked professional learning communities, teacher learning, teacher individuality, teachers' perspectives, collaborative teacher learning, teacher cooperative learning opportunities, which guide to develop students' perceptions of ability and achievement from teachers' attitudes. Continuously, the development of teachers to be an attraction in their teaching process is emphasized by the teaching practices, especially in knowledge, skills, attitudes (Ball & Forzani, 2011).

Methodology

Following the study's research goal, we analyzed the contributions of the authors and countries, participants, trends in teacher competencies, and instructors' approaches for teacher education capability. Then, to answer the research questions, we adopted and adapted the review of article methods based on Dixon-Woods, Agarwal, Jones, Young, and Sutton (2005) because their approach focused on the thematic analysis narrative summary. Additionally, we focused on the keywords "teacher competencies" based on the 169 papers we discovered. Then, we identified, assessed critically, and summarized all relevant research findings detailing teachers' competencies and techniques into 90 themes. Furthermore, we adapted Polanin, Maynard, and Dell's (2017) paradigm as follows:

Investigating and Screening

A search was conducted for all papers relevant to our objective of investigating and screening overviews: current trends in teacher education competencies. The study was indexed using various keywords, including research papers, review papers, editorial papers, meta-analysis, an overview of emerging trends, and review synthesis. In addition, advanced searching was performed to narrow the results to those relevant to our aim using the criteria of the recent five years' publications. Numerous papers are based on the Journal of Teacher Education, which publishes 61 research pieces, 28 empirical papers, and one theoretical/conceptual article each year.

Eligibility Criteria

A narrative summary of thematic analysis was used, including the objects of the article held by the research, such as preschool, primary, secondary, or post-secondary students, including universities as the objects of the teacher education. Our categories focused on the overview that authors and countries clearly stated in the title or abstract of their teacher education papers.

Findings Selection

After a thorough review and reading, the titles and abstracts of all publications were chosen. Fernandes, Rodrigues, and Ferreira (2020) used inclusion and exclusion criteria to select the literature review process. We used the overview of their characteristics and methods for the inclusion criteria, including the instruments and synthesis methods. We decided on the papers related to teachers' competencies such as values, skills, knowledge, attitudes, perspectives, and strategies for developing learning and teacher education, including all levels of education on teacher education. However, we used the papers to search general documents related to teacher education and theoretical and philosophical aspects in the exclusion.

Results

According to the purpose of this study in the Journal of Teacher Education, we focused on the competency of teacher education published from January 2015 in volume 66 to April 2020 in volume 71 and found the result as follows:

Contributions to The Journal of Teacher Education by Authors and Countries

Table 1 summarizes the authors and countries that contributed to teachers' competencies in the Journal of Teacher Education between 2015 and 2020.

The table above summarizes the geographical distribution of countries and the number of authors from each. According to the findings of this study, which examined teachers' competencies through the lens of publications, 270 individuals from 17 nations contributed to the journal of teacher education. However, the majority of authors and countries were from the US, and many authors were from this country. (208). The second-highest submissions came from European countries, with Germany contributing ten authors, and one country from Asia, Singapore, was in the top ten (5).

Table 1 Contributions of authors and countries throughout the period 2015–2020

Countries	Number
USA	208
Germany	10
Belgium	8
Israel	8
Holland	6
Singapore	5
Australia	5
Canada	3
UK	3
Columbia	2
Turkey	2
Norway	2
China	2
Sweden	1
Spain	1

The JTE participants from 2015 to 2020 are detailed

Five years of research papers on teachers' competencies can be seen in figure 1.

From our analysis from the Journal of Teacher Education in figure 1, we found that most of the research focused on developing preservice teachers, around 59 percent (e.g., Coogle et al., 2020; Kennedy, 2016) with the high number of participants in the year 2016, and some research papers focused on improving in-service teacher with 25 percent contributions in these studies

(e.g., research from Bocala, 2015; López, 2017). Furthermore, we found that most of the research during the period of 2018–2020 focused on improving teachers' competencies by implementing such at the beginning teacher (6%) and mentor/ educator (6%), (e.g., Koehler, Ertmer, & Newby, 2019; Simons, Baeten, & Vanhees, 2020).

From 2015 to 2020, the Trends in Teachers' Competencies in JTE

For the overview of the trends of teachers' competencies, we found 46 competencies from the domain of knowledge, skills, and attitudes, which can be seen in table 2.

The results in Table 2 indicate that teachers' learning is the most appealing ranking as teachers' attitudes toward teacher education competencies developed in the Journal of Teacher Education. Seventeen papers mentioned teachers' learning regarding improving the competencies of teacher education from 2015 through 2020 (e.g., Thompson, Hagenah, Lohwasser, & Laxton, 2015; Riley & Solic, 2017; Bacon, 2020). Interestingly, our analysis also found teachers' perspectives in the second-ranking position focused on teacher education. These studies emphasized teachers' treatments related to their preparation (e.g., López, 2017; Simons et al., 2020; Bacon, 2020). Several studies are focusing on competencies of teachers to improve the transformation of classroom practice, the learning of collaborative teachers, enhanced student attainment, knowledge of pedagogical content, knowledge of the subject, and experiential training by several researchers from 2015 to 2020 (e.g., Bruce & Chiu, 2015; Heineke & Giatsou, 2020). Other studies in the competencies of teacher education also reported that teachers' skills involved interpersonal and communication skills and competencies and results in instructional design (e.g., Leeferink et al., 2015; Coogle et al., 2020; Koehle et al., 2019) and teachers' attitudes can be developed by teacher individuality and professionalism (e.g., Thompson et al., 2015; López, 2017).

Table 2 From 2015 to 2020, teacher competencies will be assessed

| Competency of teachers	The number of papers submitted
Teachers' learning	17
Teachers' perspectives	10
Transformation of classroom practice	9
The learning of collaborative teachers	9
Enhanced student attainment	9
Knowledge of pedagogical content	9
Knowledge of the subject	9
Experiential training	9
Teacher individuality	7
Interpersonal and communication skills	6
Professionalism	6
Competencies and results in instructional design	6
Discussions with critical teachers	5
Experiential learning	5
Instructional instruction	5
Socio-cultural skills	4
Instructional practice	4
Networked professional learning	4
Pedagogical innovation	4
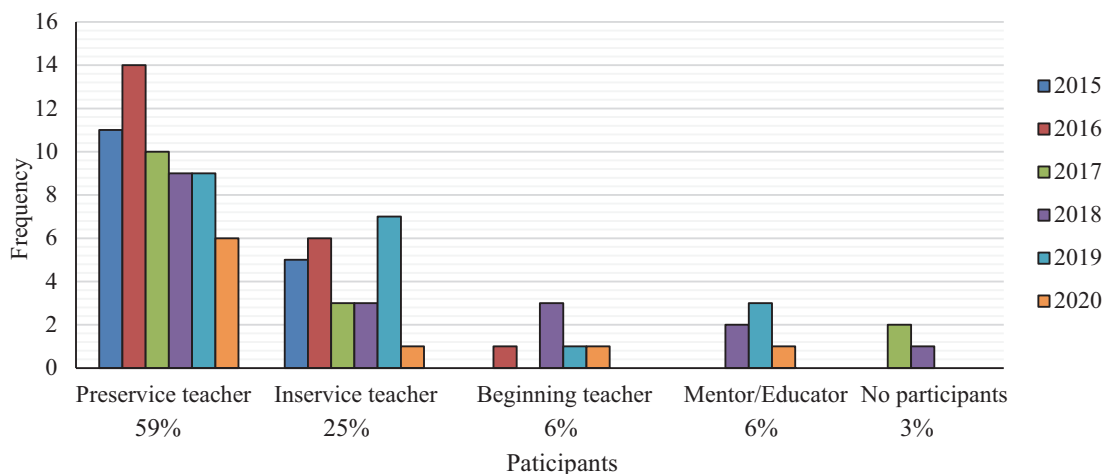
Figure 1 The participants in the JTE from 2015 to 2020 are listed in detail

The Trends of Strategies of Teachers' Competencies in JTE from 2015 to 2020

It was found that most of the papers emphasized the strategy to develop teachers that consist of either a single process or more than one strategy. From our analysis in figure 2, it can be said that most of the teachers' methods during five years was to improve teaching style by using only one strategy consisting of teachers' preparation (33%) for the majority of target groups, which demonstrates that teachers have limited classroom experience. When teachers come to the school, they should have an excellent strategy to engage students' learning. However, other findings report educational institution and community (25%), teachers' thinking (17%), video-based professional development (17%), and classroom discussion (8%).
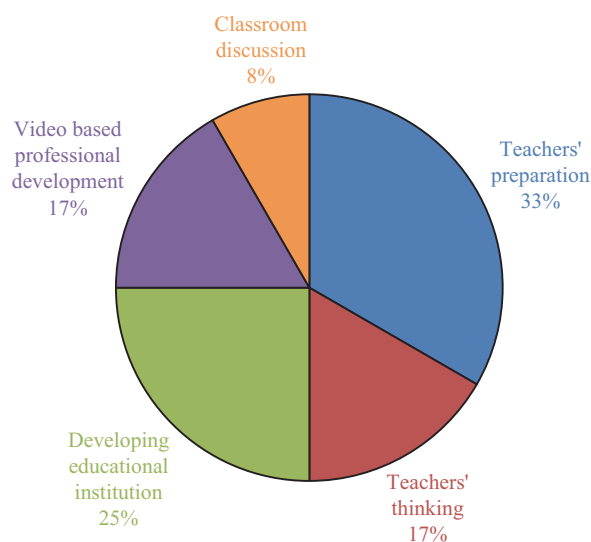

Figure 2 The spread of instructional strategies from 2015 to 2020

Discussion

Our research was primarily concerned with the contributions of authors and countries, participants, trends in teacher competencies, and teachers' strategies for teacher education competency. We examined the content, structure, and outcome of teacher education papers published last five years. Research by Ardoin, Bowers, Roth, & Holthuis (2018) examined papers' content, structure, and outcome. The review papers that use these criteria can expose the characteristics of reports, i.e., understanding the complex issues and opportunities.

Our analysis emphasized the fields of research in teacher education by the various dimensions of teachers' competencies consisting of ways of teachers' thinking, teachers' working, teachers' skills, teachers' preparation, and teachers' strategies for teaching such as modelling and working. Our research indicates that the majority of authors and countries are from the US, with a total of 208 authors contributing to this journal, which focuses on the preparations, experiences, and outcomes of preservice and novice teachers, with up to 58 percent of participants have published in the Journal of Teacher Education between 2015 and 2020 (e.g., Coogle et al., 2020). These findings are similar to Lin et al. (2019), whose results indicated authors and countries in the three journals (SE, JRST, and IJSE) from 2013–2017 showed that the US is always in the number one position for contributors. It seems like the Journal of Teacher Education is a highly reputable journal for most researchers, especially for Asian countries. Also, this journal has only accepted papers from English speaking countries during the last decade. On the other hand, the US is a country that focuses on more research to improve the teacher education community and tended to publish research findings in this particular journal. The United States has focused on developing teacher education for five years of publications with the most participants from preservice teachers, which indicates the preparation of teachers when they are becoming teachers. It is also valuable to see that preservice teachers can better understand the teaching model when participating in the research (Jenset et al., 2018).

Additionally, as shown in Table 2, most papers in the Journal of Teacher Education developed the competencies and attitudes necessary to improve teacher education. Several studies from (e.g., Bacon, 2020) emphasized teachers' learning, and other studies from (e.g., López 2017) focused on improving the teachers' perspectives and teachers' knowledge: Transformation of classroom practice, enhanced student attainment, knowledge of pedagogical content, and knowledge of the subject as the most desirable teacher-development competencies. Studies found that interpersonal and communication skills can enhance teachers' skills and competencies and result in instructional design (e.g., Leeferink et al., 2015; Coogle et al., 2020). Teacher individuality and professionalism can help shape teachers' attitudes. (e.g., López, 2017). Findings indicated by some researchers such as Chong and Cheah (2009) and Education (2009) mentioned teachers' quality and work that depends on the teachers' skills to build teachers' values, knowledge, or skills as core components and deals in the curriculum development. Specifically, in the Journal of Teacher

Education from 2015–2020, skills and knowledge in the teaching process were identified as the outcome and training. In a similar vein, Medeiros et al. (2018) argued that the abilities of teachers and/or problem-solving skills might be seen in their ability to analyze students' performance or in their feedback during classroom activities. Presently, these researches focus on developing teachers' competencies by highlighting inquiry, innovation, reflection, mutual respect, personal connection, collaboration, and community to fit with the 21st-century professional criteria (Organisation for Economic Cooperation and Development [OECD], 2016).

Additionally, our research discovered that teacher preparation was ranked at 33% across all target groups. Further, the findings indicate a lack of classroom experience on the part of teachers. However, a small percentage of papers (25%) was devoted to educational institutions and communication development. Piwowar, Thiel, & Ophardt (2013) corroborated these findings, finding that teachers who employ effective strategies can assist students in engaging in learning. This could be gained through training through lecturing, simulations or role-playing and microteaching, and mediated video circles to analyze own videotaped teaching. Our findings also reported several competencies in the domain of teachers' thinking (17%), video-based professional development (17%), and classroom discussion (8%). These findings support the previous study from Polikoff (2013), who argued that training teachers with experience and practice could have benefit measures to get stronger associations with instruction.

Conclusion and Recommendation

Teacher education is critical in preparing teachers to achieve their goals. Trends of teacher education research from 2015 to 2020 focus on developing teachers' competencies through teachers' learning as one of the components in teachers' attitudes, which several researchers have created the most. Although most of the research in our systematic review emphasized more on developing teachers' learning, we also have critically identified that the ways of teachers' thinking, working, and preparation, which is the most attractive teachers' strategies, have also been emphasized by several researchers to improve preservice teachers' professional development to prepare the value and better understand the model of teaching in practising teachers. The highest number of authors and countries' contributions in this

journal were from the United States, comprising of participants as preservice teachers (59%), in-service teacher/ school teachers (25%), or beginning teacher (6%) and mentor/ educator (6%). These findings of the systematic review indicate the importance of teachers' treatments related to their preparation. Thus, we suggest that further research and studies need to identify the most effective preparation and knowledge of teachers and skills in-depth as an example the transformation of classroom practice, enhanced student attainment, knowledge of pedagogical content, knowledge of the subject, interpersonal and communication skills and competencies and results in instructional design that is appropriate for 21st-century classrooms

Conflict of Interest

There is no conflict of interest.

Acknowledgements

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