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# A Systematic Review Of Teacher And Principal Quality Improvement Research: Gap Theory And Practice To Prepare For The Future Direction Of 21st Century Education

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**Abstract**

The importance of principal competence and teacher discipline is one of the determinants of increasing teacher productivity and the success of a school. An increase in the quality of teachers and principals also needs to be done to adjust the dynamics of education in the 21st century. This study aims to determine the gap between theory and practice to improve the quality of teachers and principals in dealing with education in the 21st century. This study uses a systematic review analysis. A systematic review was conducted to obtain an overview of the existing literature regarding the quality of teachers, principals, and the future direction of 21st-century education. A systematic review was conducted on Scopus indexed journal articles from quartiles one to 4 in the last 5 years. The results of the analysis are then identified and selected problems that require further investigation, further as well as identifying patterns of theories and methods adopted by previous researchers and participants involved in the research. Findings from the systematic review were then listed and categorized based on research gaps related to teacher quality, principals, and the future direction of 21st-century education.

**Keywords**: Principal Quality, Teacher Quality, 21st Century Education

## Introduction

The presence of the 21st century or the digital age is driving the emergence of new information and communication technology (ICT) in which professional competence must be coordinated in a variety of areas, including the field of education [1]. In an increasingly digital world, technology skills have become an important ability to possess, not just professionals [2]. Schools are responsible for communicating these skills to teachers and principals, printing them out and passing them on to future generations of professionals. Teachers play an important role in the ability to use new technologies. This is an important prerequisite for the effective application of these skills. Teachers and principals must be capable of applying technology to learn the role of this application. Of course, technology can provide learning conditions that can help students better understand. This improvement is due to a combination of learning media devices, which use hardware and modeling tools to improve laboratory activity in schools, simulation software, and a smartphone virtual laboratory for student understanding. [3], [4]leverage e-learning platforms [5], [6].

Research into improving the quality of teachers and school principals in learning skills in different countries has influenced the urgency of training professional teachers [7].

This tool uses hardware and modeling tools [7], [8], simulation software, and a smartphone virtual laboratory for students to understand or use the e-learning platform to enhance laboratory activities in junior high school. .. These are the three aspects of technology-related teacher training [9]. First, early education and training programs need to focus on developing the skills teachers need to use ICT for educational purposes. Second, the emergence of new codes and languages derived from digital technology. This requires teachers to be willing to adhere to a range of ethical and professional standards in order to conceptualize the educational role of digital technology. Third, we need to think about creating a central teaching model. The teaching model embraces pedagogical innovations where digital technologies can be the best pretext for change and encourage creativity in the classroom. The form of training often given to teachers and teaching staff for professional development is generally in the form of the use of technology, strategies and teaching needs. The above exclamation marks show that the skill requirements of the 21st. This article describes several studies related to improving the quality of 21st century learning in the classroom by teachers and principals.

One way to give full play to the role of teachers and principals is to improve the quality of teachers and principals, while adjusting the abilities that teachers must possess in the 21st century. One of the characteristics of the 21st century is the ability to digitize and use technologies that must continue to be developed. Therefore, a systematic review of the literature review was conducted to understand what capabilities educators and school principals need in this 21st century education era.

## Theoretical Framework

### 21st-Century Education

The development of 21st-century education affects all sectors including the education sector. The importance of preparing teachers and principals with special knowledge and skills in the 21st century affects the learning process in today's era. Digitalization and the use of technology are demands in the 21st-century education era. These demands need to be prepared by teachers from an early age. Therefore, it is important to analyze the readiness of teachers and principals in preparing education in the 21st century in terms of lesson planning, teaching, and learning processes, and assessing student learning as important aspects of the learning process. In the development of the education era in the 21st century, developments in all fields such as economy, industry, technology, and education are signs of the 21st century. All things are developed globally [10]. Industrial revolution 4.0 is the result of development in the 21st-century era implemented by the Indonesian government. People are trying to compete in the era of globalization. One of the important things besides technology that needs to be mastered is language. Therefore, English occupies an important position throughout the world as an international language [11].

The characteristics of the 21st-century education era are the result of the demands of the times. There are 4 main frameworks for the 21st-century education era, namely life and career skills, learning and innovation skills, information skills, media, and technology [12]. Bialik [13] state that knowledge is not enough for students in the industrial era. To meet the need for an appropriate curriculum, the government implements the 2013 Curriculum. The 2013 curriculum is an education system that has been implemented by the Indonesian government. One of the reasons for implementing this curriculum is to prepare students to have the competencies needed to live in this era [14]. Related to this, Syamsuri & Ishaq [15] stated that the 2013 Curriculum adapts 3 concepts of the 21st-century education era, the first is 21st-century skills, scientific approach, and authentic assessment.

Schools play an important role in preparing students for higher education. Gamar et al. [16] stated that elementary school is a first-level learning program in most countries including Indonesia. Elementary schools shape the character, knowledge, and skills of students from the first stage of education. Artini & Padmadewi [17] state that formal education is needed to make students have good life skills. That is what is needed to face the 4.0 revolution in Indonesia. They are prepared from the beginning of formal education. To be ready to live in the era of the 21st century. Teachers and school principals have a big role as educators in guiding and preparing students with the skills and knowledge to face their world. Teachers in the 21st-century education era must be aware and aware of what skills they must master to be able to face the challenges of the 21st-century education era. This is also supported by Pacific Policy Research Center [18] which states that teachers must understand 21st-century skills to help students achieve their goals in the 21st century. 21st century education century. The ability and competence of teachers in managing planning in teaching and learning activities, the process of teaching and learning activities, to the assessment stage are important. They must incorporate 21st-century educational skills in their teaching and learning process for students. Teachers need good perceptions and have readiness in preparing students in the 21st-century education era.

**Teacher and Principal Quality Improvement**

Several previous studies have studied the readiness of teachers and principals in the 21st-century education era. The first is from Rusdin [19]. He found that the level of teacher readiness in implementing 21st-century education was high. Balajadia [20] also conducted research on teacher readiness. He found that teachers believe in their readiness to develop quality in 21st-century educational readiness. Despite many previous studies conducted, this research emphasizes the insertion of skills in 21st-century education in terms of lesson planning, teaching and learning process, and assessment of English teachers. Teachers must realize that 21st-century educational skills are a provision for teachers and school principals to provide life skills teaching for students and need to be prepared for basic education. Norahmi [21] supports that teachers must be aware of 21st-century educational skills in the current era. Handayani [22] also argues that in accommodating students with skills in the 21st-century education era, teachers must take up their duties in preparing themselves effectively as teachers living in the 21st-century education era. The importance of preparing the skills of teachers and principals to improve teacher quality and principals in the era of 21st-century education is very important so that educational goals can be achieved optimally. Therefore, it is necessary to conduct an analysis related to the existing theory and application in the field of whether the skills of teachers at this time can indeed be said to be feasible in facing the era of 21st-century education.

Competence is an important characteristic of how a person behaves or thinks in different situations and adapts to changes from time to time [23]. Moreover, competence is something that a person does, and the results can be observed. Although the meaning and definition of the term competence are still debated [24], the aim of this study is to adapt the definition put forward by [25]. According to Bartram, competence is a group of behaviors that play a role in achieving the desired results or results. In other words, the capability is a person's ability to apply or use his knowledge, skills, abilities, behaviors, and personal characteristics to perform difficult tasks in certain roles and positions.

**Materials and Methods**

**Methods**

The systematic review is carried out using the relevant standards specified in the Preferred Reporting Project (PRISMA) standard for systematic reviews and meta-analysis [26]. In the early stages of the review, we evaluated recent research on teacher quality, principals, and the future direction of education in the 21st century. Table 1 below shows the systematic reviews performed to evaluate the topics under this topic. From the initial stage, find articles that meet the inclusion criteria. Before listing the exclusion and inclusion criteria on which the evaluation is based, the following subsections describe the purpose of the evaluation and search strategy. Then the next part reports the research results and establishes research gaps, which in turn reveals areas that require further research. A systematic review was undertaken to obtain an overview of the existing literature on the quality of teachers, principals and the future direction of education in the 21st century. The ultimate goal of this review is to critically assess relevant research in an attempt to examine research gaps in order to determine directions for future research. related to the topic. The taxonomy of research gaps by Miles [27] is based on identifying and selecting problems for further study and identifying models of theories and methods adopted by previous researchers and participants who participated in the study. The results of the systematic review were then listed and categorized based on research gaps related to the quality of teachers, principals and the future direction of education in the 21st century.

**Data Analysis (italic form**

To search for articles related to systematic reviews, we implemented a structured search strategy using three main sources as sources: Electronic databases (that is, Springer collections, Science Direct collections, Jonuns collections, and other Scopus indexed journals). Searches from different sources give somewhat similar results for content and duplicates for general content, but the list of resources retrieved has different results. For example, searching an electronic database gives the same results as searching for Springer, especially in a particular area..

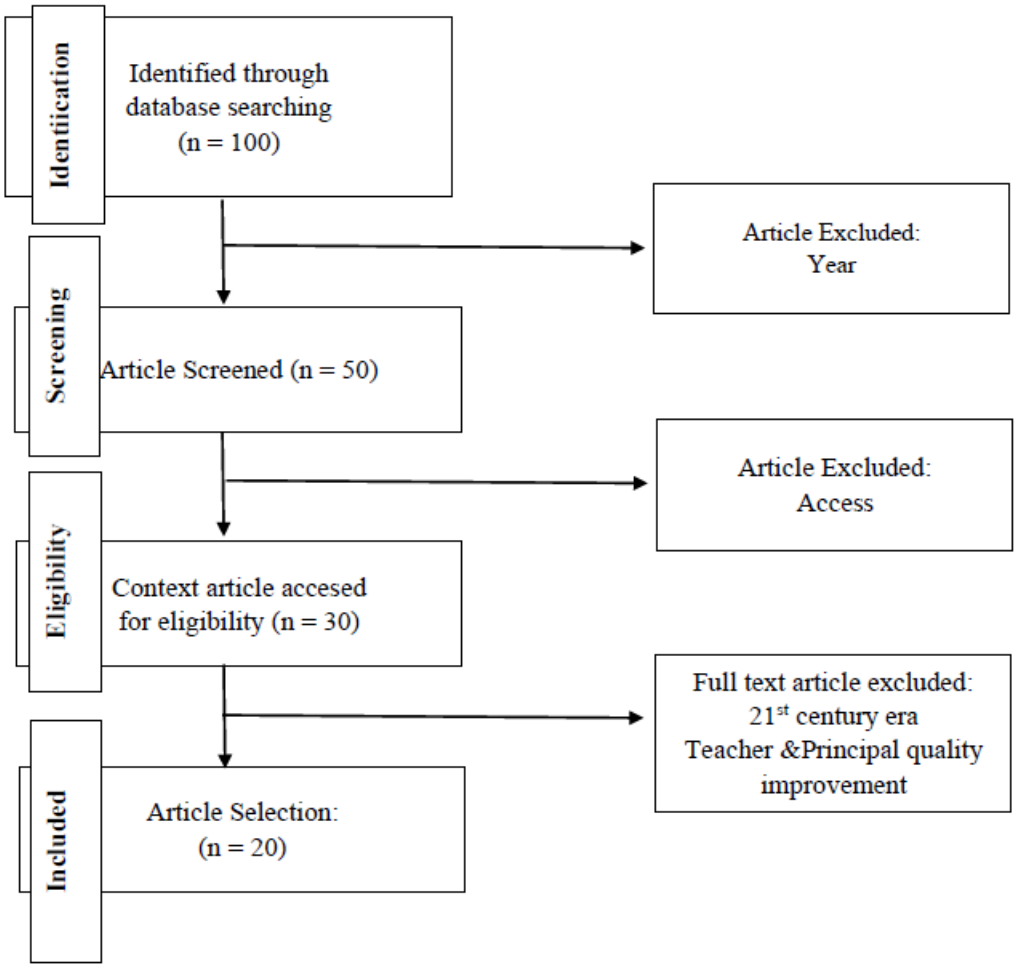
All recognized articles are retrieved from online databases. Use the and or operator to search for resources with the following keyword combinations:<concept> , Improve the quality of teachers and principals, and the future direction of education in the 21st century. The article is searched to a saturation point (ie, the same article is obtained even if a combination of keywords is used). different). The year of publication is not set as a parameter, so as to include as many published works as possible for analysis, so as to deduce the publication mode over the years. After searching the database, read the abstract of each article to determine whether the article is likely to be classified under the theme of improving the quality of teachers, the quality of principals, and the future direction of education in the 21st century.

As mentioned, all potential articles were collected and then analyzed individually for each concentration. Related to improving the quality of teachers and school administrators and the future direction of education for the twenty-first century. The PRISMA flowchart (Figure 1 below) shows the articles that came from the initial research. A screening process was then conducted to identify duplicate and irrelevant articles, downgrading articles related to improving the quality of teachers and principals and the future direction of education in the twenty-first century. Additional examination confirmed that only 20 articles matching the inclusion and exclusion criteria were included. It is concerned with improving the quality of teachers, school administrators, and the future direction of twenty-first century education. These articles discuss various levels of education and studies conducted between 2017 and 2021 as presented in Table 1 below.

Diagrammatic Representation of The Literature Search and Review Process

**Figure 1**. PRISMA flow diagram for the search articles

Table 1: Results of a systematic review of the selection of articles on improving the quality of teachers and principals (n=20)




Since the focus of this systematic review is to improve the future direction of teachers, principals, and second-century education, it focuses on articles in similar fields and key points. It also includes countries/regions where relevant research is conducted, because the standard will have some impact on the culture and teaching background of teachers and principals. In the systematic review, the research framework and theories, methods and participants of previous studies are analyzed. Determining the relevant framework to construct the investigation is very important to ensure the rigor and credibility of the investigation results. The number of journal articles in the research is recorded because this information can guide the design of further research. Table 1 above describes the systematic review methods described in the inclusion criteria section. The table lists the types of data collected, thereby revealing the direction of each research reviewed.

**Results and Discussion**

In the first article entitled “An Approach of Teachers' Quality Improvement by Analyzing Teaching Evaluations Data” written by Chaki et al. [28] with the result that there are many institutions that use teaching evaluation to study students' opinions about teachers, but they do not use the information properly. The existence of an institution that can easily implement a system of providing evaluations of criticism and suggestions for teachers regularly will provide precise information on why students are

dissatisfied with teachers and how a teacher can increase their acceptance among students. On the other hand, in a study conducted by Brutti & Sánchez Torres [29] which explains that in Colombia, to improve the quality of teachers, schools in Colombia set new standards in the recruitment process, namely; (1) pay attention to what standard competencies teachers have (2) pay attention to the quality of prospective teachers with special competencies possessed by prospective teachers (3) the last acceptance requirement is to pay attention to the level of teacher education. They believe, with a higher level of education, they will get the best quality teachers. In addition to education level, they also look at the accreditation of universities and their majors.

In addition, Talebizadeh et al. [30] conducted research analyzing the relationship between principle-centered learning leadership and professional teacher learning, with an emphasis on examining the effect of principle-centered learning leadership practices on teachers involved in professional learning and the facilitating role of trust and behavior. Share teacher knowledge using structural equation models on a data set of 886 teachers. of 121 elementary schools in Iran, the results showed that school principals can communicate and enforce broad models in the bureaucratic structure and hierarchy of the education system in Iran, which have been filtered by the Ministry of Education, in order to motivate teachers to learn together. Principals can also create school conditions that support teacher collaboration in learning activities, such as collaborative observations with teacher groups and lesson plans aimed at improving knowledge and practice. In this setting, it is important to be secure and build trust within the teacher group. To support this, education authorities need to invest in designing and implementing professional development and creating learning communities to assess the impact on teacher practice. This is consistent with the work done by Lee et al. [31] is considering the application of web-based school management, which explains that it requires the role of principals and teachers to understand the innovations that exist in education in order to adapt to the current technological era.

Meyer & Norman [32] in his research on changing the design of education in the 21st century explains that the adjustment of education in the 21st century is by paying attention to what design should be used in schools. The design itself must be related to the development of technology with characteristics that exist in the 21st century. Almerich et al. [33] conducted a study on 85 students of Pedagogy and Social Education from the University of Valencia with the results that it was found in ICT competence that ethical competence affects technological competence, and secondly on pedagogical competence. In addition, gender and frequency of use of technology tools, both at a personal and academic level, influence this structure and essentially ICT skills. The proposed model shows the complexity of 21st-century competencies in students. This model contributes to meeting the need for reviewing student transverse competency training. This must also be fully supported by the existence of leading educators who also have good information and communication technology skills.

In addition, the research by Liesa-Orús et al. Century with their students. Its use in university teaching has the potential to foster a collaborative and cooperative dynamic among students, flexible and interpersonal communication, the creation of teaching-learning communities and the design of active teaching models in which students can exchange information and listen. for their own sake. The results of this work in turn reinforce the transcendence of the analysis of the professors' perceptions of the contribution of ICT to competence development. In this way, according to the positioning they show. The discussion about the skills and competencies of the 21st, developed in the context of this literature research, regardless of the respective epoch, identity and the educational process are based on their purpose. It is the goals set for each educational system that define the areas considered important, the skills and competences to be developed in school practice, the convictions that guide the decisions, the resources to be used. The education system has four core objectives: economic, cultural, social and personal.

The classification in the survey results part is difficult to be accurate and specific, because according to the interpretation of each term, several skills can be equally classified into one or more categories, which may depend on the context, perspective, and even the identity of the translator. As mentioned earlier, the ambiguity of terminology adds to the complexity of discussing skill 21. Furthermore, skills themselves are inherently multi-faceted and multi-level concepts. Take creativity as an example. Although this may fall into the category of personal skills, some aspects of it transcend boundaries, such as shared creativity. This especially occurs at a higher level than all the skills and abilities discussed. For example, communication is discussed as an essential skill of the century, from communication to skilled communication in the native language, skilled multilingual and multilingual communication, cross-species communication, digital environment communication, communication result oriented. , Communication-oriented innovation, etc.

In fact, what gives communication skills in the 21st century? The dimension of the century is a combination of skills and abilities in other categories. As a result, the four categories shown in Table 6 can only be split or, more appropriately, connected by dashed lines, allowing for better visualization of essentially interrelated characters. In addition, textual analysis reveals that there are some transcendental issues that are treated as important features of the modern educational, social and economic context that determine the nature of skills in the 21st century. increase. This specifically points to the global nature of the world, the evolution of technology and ICT, and the need for innovation. The new conditions that result from globalization give each of the skills and abilities discussed a particular dimension. Educators discuss a list of skills that are interdependent, heterogeneous, and presented in the context of diverse global environmental characteristics. For example, discussions about skills such as teamwork and leadership are not new in the educational literature.

What is new, however, is the fact that beyond teamwork and leadership skills, as Almerich et al. [35] where the new knowledge society requires new skills known as 21st century skills. These competencies are further subdivided into overarching thinking skills. and competence in information and communication technology. Rubach & Lazarides [36] noted the importance of assessing teachers' proficiency in information and communication technology (ICT) in order to adapt to the education age of the 21st century. Sulaiman & Ismail [37], who for the school transformation 2025 (TS25) the competences and abilities of teachers in the 21st point for the successful implementation of the 21st century, namely the practice of the skills. On average, studies around the world have shown positive signs of cultivating the ability of high-quality educators [38]. Indeed, a competent teacher is a teacher who is beneficial to students. This view is supported by a quantitative study of 91 teachers, which found that 64.8% of teachers have excellent abilities in dealing with students with dyslexia, and it was confirmed in their interview results [39]. Not only in the classroom, but also in the implementation of extracurricular activities, the teacher's ability is also the highest. In addition, teachers can assess their ability to apply ICT to improve the quality of teaching for students.

One of the benefits of digital technology (the Internet) as a hallmark of learning in the 21st century is the availability and accessibility of materials, according to a study of teacher preparation to realize the abilities of teachers in the 21st century. The purpose of this study is to formulate special abilities and measure teacher readiness in the face of learning in the 21st century. Based on the four teacher abilities and the three components of TPACK, it was determined as a special ability attribute of the 21st century teacher abilities. The results of the survey show that researchers convey a statement that "teachers need to do online learning (e-learning)" for another item in order to determine the teacher's readiness for implementing online learning. is showing. Most (74.1%) teachers are ready to implement online learning, while others are hesitant (19.6%) and unprepared (6.4%) to implement online learning. Based on these two

data, it can be seen that teachers in North Sumatra are ready to implement online learning and meet the educational nature of the 21st century [40].

The application of education in the 21st century is described in an article on virtual-based online learning written by [41]. The results of this research show how well teachers and students are prepared for information and communication technology-based learning. In addition, related journals describe in detail the learning media that support learning in the 21st century, including a virtual internship, which can realize the content in the real classroom and bring it into the virtual classroom.

The existence of a school director is one of the main factors determining the quality of education [42] - [44]. School principals must acquire the skills necessary to get along with teachers, especially as they begin to integrate technology into teaching and learning. Directors cannot be effective without advanced interpersonal technologies and communication skills [45]. This is necessary in order for the director to have managerial skills. The managerial ability of a director is an additional ability that a director must have in relation to his position. The six abilities school principals should have are: teaching ability, professional ability, social skills, spiritual ability, and entrepreneurial ability.

Management skills are used to empower school resources and existing resources to achieve the school's vision and mission. Some of the things managers do are planning, organizing, implementing, and evaluating. It is the responsibility of the school community, including the principal, as well as the teacher, to achieve the school's vision and mission as a set goal. Teachers who are at the forefront of learning implementation in student education should always provide student coaching. One of the things you can teach your students is the discipline of the teacher. Timely participation in education and other activities is critical to teacher productivity and the achievement of the school's vision and mission. Discipline is the observance or observance of rules (rules of conduct). Therefore, teacher discipline is the willingness to follow all existing rules and norms in carrying out duties as a form of student responsibility for education. After all, teachers are a mirror of students in attitudes and examples, and teachers' disciplined attitudes add color to much better educational outcomes.

Specifically, work discipline respects, respects, and adheres to regulations that apply both in writing and in writing, and violates the obligations and authority given to work discipline, which is also very important to teachers. It is an unavoidable attitude that enforces sanctions in some cases. .. Therefore, discipline must continue to permeate teachers. The issue of discipline is a concern for all human beings. Discipline plays a vital role in guiding human life in achieving work goals and success. Teacher productivity reflects the quality of teachers in performing their jobs. Teacher productivity is influenced by several factors, including infrastructure, funding, training, education, and self-discipline. Teacher productivity can be improved if supported by the principal's excellent management skills and the teacher's own discipline. [46]

A study conducted by Deryabin et al. [47] Regarding the opinion of Russian principals on the digital capabilities of participants in the education system, less than half of students and parents believe that teachers are capable of organizing learning remotely [48]. In this case, the schoolchildren show defects in independent learning ability. Parents feel lost in the introduction of new forms of learning and their role in the educational process [49]. Studies have shown that the obstacles to digitization are not only the lack of necessary information and technology resources in schools (tool gap), but also the inability to use them correctly (method gap), and most importantly, the inability to formulate new target schools. In schools, digital technology will be used meaningfully and will produce new educational results (semantic gap) in quality.

Elimination of the mechanistic gap was facilitated by the implementation of the federal project “Digital Education Environment”. The “Educators of the Future” project envisions an advanced training program for faculty members, in which emphasis is placed on the effective use of digital technologies within the

framework of traditional curricular tasks - and as a result, we can expect to reduce the digital divide at a methodological level. Educational activities in the context of digital transformation can be rethought in practice-oriented programs and oriented activities specifically organized for educational institutions development teams. A feature of the program is to immerse participants in the digital reality. Educational content, the ability to change the curriculum quickly, the need to create educational requirements regarding the progress of the program, the need to take a proactive position to design new ones. Educational process (programming of development) between the school model and oneself, joint evaluation of task performance, etc. The result of the program is a vibrant community of digital transformation model projects, pilot implementations and professionals.

Rachmawati et al [50] states that school principals need to have management skills for effective leadership. It will help you achieve your school goals. High management skills contribute to the management and optimization of school resources. In addition, Tang [51] states that it is exemplaryally important to identify core competencies that are important in the development of secondary school principal preparation programs. 21st century dynamics. The research conducted by Artacho [52] explained that the research conducted is to explore whether the variables of previous ICT training directly determine whether teachers have higher digital literacy. relation. Digital capabilities, except for communication and communication dimensions. Collaboration and digital content creation, which reaffirms the low benefits shown in the descriptive analysis based on the subject samples analyzed. Most of them have never received any ICT training before. In view of this situation, it is emphasized the need to further encourage continuous training of teachers and future teachers, because at this stage, future teachers must have the ability to interact with ICT and learn a set of skills that will enable them to develop their digital capabilities. Based on the above discussion, it is necessary to study the factors that affect the quality of teachers and principals to adapt to the future development direction of education in the 21st century in Indonesia.

**Implication For Future Direction**

This systematic review combines data obtained from quantitative and qualitative research. The difference between quantitative research and qualitative research is that there are fewer participants participating in qualitative research, so research results cannot be generalized. This systematic review requires qualitative research, because the review involves all studies under the inclusion criteria, which helps to ensure that effective and reliable research gaps are identified and provide information for future research directions.

This systematic review provides more specific guidelines on problem selection, theory, and methodology for researchers interested in studying the quality improvement of teachers and principals in education, especially for novice researchers. It will serve as a guide for future research directions. In the future 21st century.

**Conclusion**

The results of research related to the literature review in the discussion in this article reveal that the principal's managerial competence consists of conceptual, technical, and interpersonal competencies to realize creative schools, principals apply six ways; namely establishing a vision and mission, implementing network-based innovative programs, implementing responsive management, building a productive culture, improving the quality of human resources, and building cooperation and humanizing subordinates. In addition to the several competencies above, teachers and principals must also have competence in mastering information and communication technology to be able to follow the dynamics of the 21st-century education era that is currently underway. The solution that can be given if some teachers or

principals do not have the ability in terms of digitalization is to provide training to improve the competence and quality of teachers so that educational goals can be achieved optimally.
Related to the vision and mission as well as implementing network-based innovative programs are included in the conceptual competence of principals in establishing creative schools. Meanwhile, responding to change, building a productive culture, and improving the quality of human resources are the technical competencies of principals and teachers. The principal's managerial competence is a factor that important in building creative schools with adjustments in the 21st-century education era.

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