



School Principal's Leadership Skills in 21st Century Based on Teacher Point View

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Abstract. Leadership skills are crucial for a principal to perform his duties as a leader in school. In addition, these skills develop a conducive culture to achieve school vision in the industrial revolution 4.0 era. Hence, the purpose of this study is to analyze and map the level of leadership skills as the technical, conceptual, and human skills corresponding to the 21st-century literacies, i.e., data, technology, and human, respectively. Note that the method applied in this research is a descriptive quantitative collected using a questionnaire from 112 certified elementary school teachers in Bandar Lampung City. Then, we categorize the collected data based on the skills and Likert scale. The results show that the average level of leadership skills of elementary school principals for the technical skills is the lowest, while for the human skills is higher than conceptual skills. In addition, technical skills are inversely proportional to human skills. Furthermore, the conceptual skills increase linearly according to the duration of experiences. Every aspect of the principal skills at each level of school accreditation is in the vulnerable score of 2.85–3.19 which is categorized as good. While the technical skills at a score of 2.75 are categorized as sufficient. We expect that this research can contribute the recommendations to the government to provide the program to increase the leadership competency of the elementary school principals.

Keywords: Elementary school principals · descriptive quantitative · leadership skills · likert scale · 21st-century literacies

1 Introduction

It has been well known that the formal education for each generation is obtained from the schools [1]. Furthermore, in carrying out the school operations, it is necessary to provide human resources who have the appropriate qualifications and high work ethics, as well as are skilled and transformative [2]. Besides, the qualified resources in the schools can equip the students with competencies which are following the development of science,

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technology, and art. Additionally, these competencies will be realized if school leaders can facilitate, always provide support, and create a good environment for school members [3]. Moreover, the principal as a leader having a duty to improve these competencies must also pay attention to the quality of education which is influenced by the academic atmosphere. Not only that, but the quality of education is also adjusted to the school culture that influences school members to achieve goals, focus on performance, and commitment [4]–[6].

A comfortable academic atmosphere influenced by the attitudes or behavior of the school residents allows them to think clearly without any pressure [7]–[10]. Furthermore, a good attitude will create positive relationships or interactions between them. In addition, those attitudes can be represented with four skills as part of 21st-century skills, namely communication, critical thinking, creativity, collaboration [11, 12]. First, each individual needs to establish a communication to express and share his ideas on the progress of the school [13]. Second, the school residents are ready to think critically in analyzing a problem or designing a program to find solutions to the problems encountered [14, 15]. Thus, third, a creativity in thinking is more easily realized. Forth, when individuals have problems with other individuals, they are immediately communicated and resolved. Hence, the connectivity is important for creating interactions between school members and with certain devices that facilitate academic activities [16]. This can also be interpreted as part of a collaboration.

Furthermore, 21st-century skills will run smoothly if they are supported by information and communication technology. Regarding this, leaders need to set targets and carry out plans for technological developments in the school environment [17, 18]. The ease of using technology can be an opportunity for schools to develop themselves by utilizing systems, workflows, and communication networks that are combined in smart devices to coordinate with one another [19, 20]. This also provides an opportunity for all school members to be familiar with the technology. Individual proximity to technology supports the performance of educators and education staff to run school programs. Moreover, the industrial world offers sophisticated products that can support human activities. If the school does not get used to using this technology, then this will have a bad impact on students. This will also cause a gap between the skills of graduates and market needs or the demands of entering higher education [21]. Therefore, principals need to have qualified technological literacy to collect and communicate information following 21st-century literacy skills [22, 23]. This is because the technology enables schools to innovate and develop. Without innovation, it is difficult to measure school success [24].

Principal leadership who has broad insight and the ability to collaborate can build a conducive organizational culture [25]–[27]. Indeed, the leadership can be performed by persuasion, not coercion. Additionally, the influence of leadership is not only with instructions that must be carried out but also are shown by attitudes and behaviours that are worthy of being imitated by others [28]. Furthermore, these attitudes and behaviors are clarified with one directive. Thus, work partners will happily carry out their responsibilities. The principal who ignores the feelings and behaviour of his co-workers is one of the failure factors in program realization [29, 30]. In addition, the principal also needs to be involved in every activity in each work unit so that when an obstacle is found,

the principal can immediately make a decision. For the sake of creating an academic atmosphere, school principals need to improve human resource literacy.

A leader in improving human resource literacy needs to have a clear vision of the educational institution he leads, because the vision describes active and effective leadership practices [31]–[33]. Moreover, the vision is adapted to the development of science and technology. Even, this takes into account that technology is increasingly involved in activities. The vision that has been set is disseminated to all subordinates. Along with the socialization, the principal took action by translating it into work programs. Thus, all school members can carry out their responsibilities in the direction of achieving the vision. In addition, to be able to develop the vision and mission and its realization, school principals need to master data literacy.

The principals in carrying out their duties must be supported by the skills referring to the ability to lead effectively. This leadership skills are very important characteristic for a leader in carrying out his responsibilities to build a conducive school culture [34]. Furthermore, the principal leadership role affects the success of students. Also, it has an impact on the development of the quality of education in schools [35]–[37]. So it is important to discuss more deeply the leadership skills of school principals according to various perceptions.

Previous the research by Caceres (2019) on the leadership of the principal at the Tabasco Mexico elementary school on social factors. The research design uses a descriptive and comparative study which shows the results that the strongest leadership skill is understanding, while the weakest skill is ambition. In addition, the principal's leadership skills are not only based on social factors but are based on other factors such as the creation of a shared vision, which includes all members of the learning community, motivation to develop collaboratively, management, and school administration. Furthermore, research by Niqab, Singh, & Shaikh., (2019) [38] examined the leadership skills of principals based on the perceptions of high school teachers using the fuzzy inference system (FIS) model. This model is useful as a tool to assist policymakers in assessing some of the principals' leadership in an educational institution. The research instrument used a Likert scale. The results showed that the principal's leadership skills in FDC schools were categorized as high. Additionally, research by Boyaci, & Akay., (2019) [39] examined the effect of principals' leadership on Turkish students' science learning achievement which was tested based on 2015 PISA data. Data were collected using a questionnaire taken by principals, teachers, and parents using Hierarchical Linear Modeling (HLM) analysis. The results showed that the principal's leadership skills had no effect on students' scientific achievement but on gender, economy, social status, family culture, type of school, and interactions. Lastly, Deligiannidou Athanailidis, Laios, Stafyla (2020) [40] shows the difference with this study which lies in the use of Physical Education (PE) teachers' perceptions in primary and secondary education as an indicator to determine the leadership skills of principals. This research is a quantitative descriptive study with the "gap analysis" method. Perceptions of physical education teachers were measured through a questionnaire Pashiardis and Orphanou (1999). The result of this research is that sports teachers consider 54 questionnaire statements to be significant ($p < 0.05$) about the characteristics of effective principals.

Leadership seen from the context of the industrial revolution 4.0 is called digital leadership which requires future leaders who are charismatic, directive, relational, and transactional [41]. Likewise, digital leadership refers to the successful strategy of digitizing the company and its business to respond to the current situation. Subsequently, the success of a company is certainly supported by strong leadership such as encouraging transformation and creating a clear vision [42, 43]. The company also requires leaders to innovate towards the progress of their business. In addition, leaders need to be supported by effective leadership skills to achieve the expected goals.

In the fact that, when the principal does not have leadership skills, the learning process does not go well, the school organization does not run properly, and the impact on improving the quality of human resources is low [44]. So, this study will discuss the principal's leadership skills as measured through technical skills which refer to technological literacy, conceptual skills which refer to data literacy, and human skills which refer to human literacy by considering school accreditation and the principal's tenure. Then, the data can be used as a reference to determine the right digital-based school management model.

2 Literature Review

A. Leadership

The core term "Leader, Lead, Leading, Leadership, Leaderful" is defined as roles, people, activities, qualities, and processes [45]. In general, leadership is someone who has the authority to lead an organization or institution to achieve certain goals [46]. In addition, leadership viewed from the context of educational institutions is defined as the key to developing school management to face the challenges of the 21st century [47]. So, leadership is indispensable in every aspect of life because without leadership, no one will direct anything properly.

Leadership consists of four phases, namely leadership 1.0, leadership 2.0, leadership 3.0, and leadership 4.0 [48]. Moreover, leadership 1.0 is referred to as charisma leadership which is defined as someone who has innate qualities such as supernatural, superhuman, or has extraordinary powers that come from within him. Leadership 2.0 (directive) is a scientific approach-based leadership by works in an organized manner. Leadership 3.0 is transformational leadership that prioritizes morals and seeks to meet the needs of its subordinates. So, leadership 4.0 (responsive) is leadership that prioritizes the use of technology for progress.

In addition, leadership has two approaches consist of theoretical and contextual approaches [49]. An approach that is considered to be a single leadership role applied to the impact of a leader's behavior on his subordinates. This approach is divided into two, namely the natural approach and the style approach. First, an approach that focuses on understanding the nature and psychological state of a leader. Second, the approach focuses on how leaders do work. While the contextual approach consists of a situational approach and contingency theory. Situational approach, which identifies different types of leader behavior depending on the particular situation. Thus, contingency theory focuses more on leader style theory with situational situations.

B. Leadership Skills

As a leader in organization management is required to have skills such as conceptual skills, human skills, and technical skills. Firstly, conceptual skills are mental abilities to analyze, diagnose situations, and coordinate all organizational activities [50]–[52]. Therefore, conceptual skills is an important factor in leadership related to direct decision making and planning. The leader who has this ability is required to provide real action against changing times and see new trends those are emerging in various fields [53]. Thus, the leadership in the organization is progressing in a better direction. Therefore, the leadership skills [54] can be described in Fig. 1.

Second, human skills include the ability to lead, motivate, understand, and work together individually and in groups [50, 51]. Basically, human skills are related to interactions between humans. This means that a leader needs to have this ability to get various relationships with other people, such as understanding behavior, being able to communicate well. In addition, human skills also place every member of the organization to work with teams and collaborate. Moreover, human skills are very different from other leadership skills, because it is related to human behavior. Every human being has uniqueness that other humans need to understand. For example, the leaders need to create a comfortable atmosphere for their school community to improve the quality of the organization they lead.

And the third, technical skills are skills to use a tool or procedure needed to do certain types of work [50, 51]. Those skills require to have intellectual intelligence that is related to procedures, calculations, and directly monitoring the activities of each member of the organization. Therefore, if a leader does not master in these skills, it will be difficult for organization to lead and to develop itself towards technological advances. In addition, this is the crucial one of soft skills of the leadership skills that use techniques to do definite tasks.

C. 21st Century Skills

21st-century skills are internationally categorized is required to i.e., critical thinking and problem solving, creativity, communication, and collaboration [55]. In addition, 21st century skills are characterized by the rapid development of technology and information,



Fig. 1. The leadership skill.

so that human work is generally replaced by machines. Therefore, 21st century skills are a place to develop and improve everyone's skills. Thus, every human being in the current generation is expected to have the four skills mentioned earlier. Basically, all information that is so easily received in the digital era allows everyone to be able to filter any data received by thinking critically and being able to distinguish between good or bad. Critical thinking requires knowledge, insight, and broad knowledge to be able to solve problems that are accepted in real life [56].

Furthermore, the second skill of 21st-century is creativity. It is related to the ability to get ideas or new things for a product and service that is useful for human life. Creativity is required in the 21st-century which is useful for improving the human skills. The third is communication. It is related to interact between individuals and to give an argument each other as a part of social skills. Someone with good communication will create extensive relationships to other people and will gain lot of knowledge and experience in his life. The last skills is collaboration broadly refers to teamwork in an organization. Collaboration is entailed to create new things and to exchange ideas gaining the expected goals. That is why the four 21st-century skills are very important for human being.

3 Methodology

A. Research Design

The research method used in this research is the explanatory survey method. The object of research focuses on the principal's leadership skills to describe how high the level of these skills is. The principal's leadership skills are measured through a taxonomy of leadership skills, namely: 1) Technical skills (technical skills) concerning technological literacy, 2) Human skills (interpersonal relationship skills) regarding human literacy, 3) Conceptual skills (concept skills) about data literacy. To get in-depth clarity, each research variable needs to be operationalized into measurable indicators. The population used in this study are certified state elementary school teachers in Lampung, amounting to 112 people.

B. Sample and Data Collection

This research is located in a public elementary school in Lampung Province. The trial was conducted in 94 schools with 112 teachers as respondent. The research subjects were certified public elementary school teachers.

C. Analyzing Data

Research technique using a questionnaire as a data collection tool and documentation as supporting data to assess the skills of the principal. The distribution of the questionnaires is carried out by offline and online. Which are the instruments delivered directly to the schools and distributed by online through google forms to elementary school teachers as a research sample. Meanwhile, documentation is used to search information related to the characteristics of the school, principals, and teachers. Previously, the instrument is tested for validity and reliability with the Rasch Model using Winsteps Version 3.73 for later analysis. The requirements of validity and reliability instrument test can be illustrated in Tables 1 and 2.

The data collected is analyzed quantitatively by using statistical analysis. In addition, the data described based on the results obtained from processing using analysis, the

Table 1. Criteria For Item Validity And Reliability In The Questionnaire Based On The Rasch Model

Criteria	Statistical Data	Minimum Requirements
Item validity	Item Polarity	PTMEA CORR > 0
Item	Item Fit	Total Mean Square (MNSQ) infit and outfit of 0,6 – 1,4 for polytomy Data Z-Standard (ZSTD) of -2,0 – 2,0
Item Misfit	Separation (SE) Index Person Reliability Item Reliability	All items show ≥ 2.0 Value > 0.8 (Bond & Fox, 2007) Value > 0.8
Reliability	Cronbach Alpha	Value > 0,7

Table 2. Cronbach Alpha Interpretation Score

Cronbach Alpha Score	Value Interpretation
0,8 – 1,0	High Reliability
0,7 – 0,8	Good Reliability
0,6 – 0,7	Sufficient Reliability
< 0,6	Bad Reliability

Table 3. Ideal Assessment Criteria

No	Score Range	Category
1	$x > 3.4$	Very good
2	$2.8 < x > = 3.4$	Good
3	$2.2 < x > = 2.8$	Sufficient
4	$1.6 < x > = 2.2$	Less
5	$x < 1.6$	Very less

description is continued qualitatively according to the ideal assessment criteria in Table 3 [57], so it can be stated the level of leadership skills of elementary school principals in Lampung is very good, good, sufficient, less, and very less.

4 Results

This study began by compiling a questionnaire instrument to measure the level of leadership skills of school principals. The leadership skills in management are divided into three aspects, namely: 1) Technical skills, 2) Human skills, 3) Conceptual skills. These

aspects are further elaborated into 39 indicators with 13 indicators each. The instruments are given to 45 respondents. The data obtained are then analyzed for validity and reliability with the Rasch Model using Winsteps Version 3.73. Data from 45 respondents were collected and analyzed, the Cronbach Alpha reliability coefficient value is 0.96. Thus, the research instrument compiled is considered to have a high level of consistency [58, 59]. This statement is also reinforced by the reliability value of the items of 0.86 and the reliability value of the respondents of 0.96 (greater than 0.8) (Bond & Fox, 2007; Fisher, 2007; Pallant & Tennant, 2007) as well as the separation value. The index of the item is 2.47 and the separation index of the person is 4.65 (greater than 2) (Bond & Fox, 2007; Fisher, 2007; Linacre, 2007).

In more detail, the analysis is deepened down to the item level of the instrument and obtained data on the value of PT-Measure Corr. on all items more than 0. This indicates that all items can measure what they should measure (Bond & Fox, 2007). In addition, almost all items have a Mean Square (MNSQ) value for both infit and outfit between 0.6 to 1.4 and a Z-Standard value (ZSTD) for both infit and outfit between -2.0 to 2.0. Thus, except for items A2, C3, C5 and C13, it can be stated that all items developed are fit to measure the construct (Latent Variable) (Bond & Fox, 2007; Linacre, 2010; Sumintono & Widiharso, 2013). So, obtained a valid and reliable instrument with detailed indicators as follows (Table 4).

Additionally, principals have three leadership skills which in each aspect are developed into 35 indicators. The indicator measures the three items based on a teacher survey on the achievement of school accreditation. Then the results of the survey are illustrated in Fig. 2.

The Fig. 2, it can be stated that every aspect of the principal's skills at each level of school accreditation is in the range of scores from 2.85 to 3.19. This shows that the

Table 4. Distribution of Indicators in Each Aspect of Leadership Skills Assessment

No	The Aspect of Leadership Skills	Amount (item)
1	Technical Skills	12
2	Conceptual skills	13
3	Human Skills	10

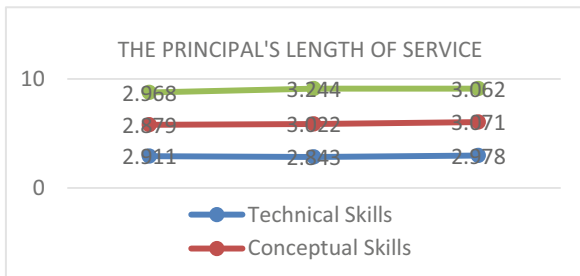


Fig. 2. Graph of the assessment of principals' skills by teachers based on school accreditation

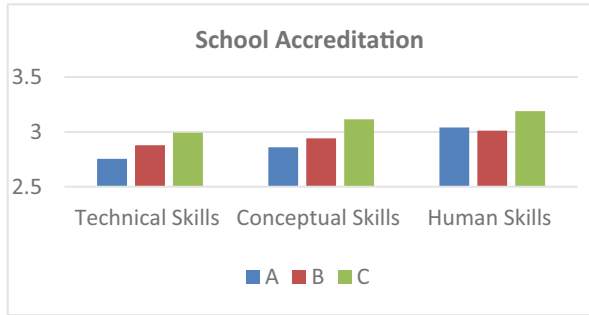


Fig. 3. The principal's leadership skills by assessment on teacher's point of view

principal's leadership skills are categorized as "Good" [57]. However, there is one skill that is at a score of 2.75 with the "Enough" category, namely: Technical Skills.

Based on Fig. 3, it can be stated that the technical skill level of the principal in the first 2 years is approximately 2.9 with the "Good" category. However, these skills experience a decline in the middle of the term of office (2–4 years). However, there was another increase in skills at the end of the term. On the other hand, the principal's conceptual skills increase with the passing of the tenure. Meanwhile, the principal's human skills are in contrast to technical skills where in the middle of the term of office there is an increase and then decreases at the end of the term of office.

5 Discussion

The aspects of the principal's leadership skills do have scores that are not much different. However, if the Principal's Technical Skills, which have been in the lowest position so far, are left unattended or not improved, the development of the school, both management and learning, will be disrupted. Moreover, the current Industrial Revolution 4.0 Era requires all school elements to follow the development of science and technology (technology literacy). Furthermore, school is a place for students to prepare for real life, where all activities have been dominated by using advanced technological aids. Thus, principals need to create a professional learning community that focuses on student learning (Stoll & Louis, 2007). This is where the principal plays an important role in reading the times and creating breakthroughs that can increase the innovation of educators and education personnel so that they always run in balance with the development of science and technology. This innovative behaviour is an important factor that influences school innovation [60] and can also help schools maintain school existence [61].

Regarding this, a school principal needs to equip himself first before bringing school members to achieve the vision and mission. A good understanding of technical matters that pay attention to the development of science and technology can form a leadership that affects the improvement of the quality of learning, the professional community, academic achievement, and school efficiency [62]. The school community will not feel burdened by these high standards if the principal is directly involved in providing direction for technical activities. This is because the principal's leadership is an important factor in the success of school performance [63, 64].

Seeing such a phenomenon requires an in-depth analysis. As the level of school accreditation decreases, the assessment score increases. This applies to all aspects of the principal's skills. Thus, it can be stated that schools that have accreditation level A have human resources who have higher standards of assessment in assessing the performance of principals [65].

This condition is also influenced by the self-quality of the home base school which can increase performance higher or lower [66]. At the highest level, respondents are more confident in assessing school principals because the system has been running in a transparent and accountable manner. This is also proof that schools at the highest level have academics who master human literacy. Thus, a harmonious school climate is created so that in giving opinions, the respondents are not psychologically under pressure. Meanwhile, in schools with low accreditation levels, respondents tend to show a cautious attitude, including in providing answers to the questionnaire given. Therefore, there was an increase in the assessment of the leadership skill level of the principal along with a decrease in the accreditation level of the school where the respondent came from.

In technical skills, there is a decrease and then an increase because in the middle of the term of office. This is because schools are already busy with implementing programs in the middle of their tenure. The buildup or series of program implementations are not all handled by the principal. The person in charge of the program tends to implement the program independently. Thus, it can be stated that the principal of the school submits fully to the person in charge of the program. Therefore, in this case; principals do not show that they have sufficient technological literacy in the eyes of the respondents. However, at the end of his term of office, the principal has had more free time to assist technically with technological assistance after some school programs have been implemented.

This condition is in contrast to the human skills of the principal. As a result of the full delegation of authority for program implementation to the person in charge, the principal has more time to communicate with all program implementers equally. Principals provide more motivation and moral support to encourage implementers than technical assistance [67]. This condition also allows the principal to respond quickly if at any time there is a program implementer who reports on the progress of program implementation. This is one example where the principal has good human literacy [68]. However, at the end of the principal's term of office, the human skills decreased. This happened because the principal's term of office was about to end, so the intensity of interaction with the academic community began to decline. In contrast to the principal's conceptual skills, where there is a linear increase. Along with the longer and more programs that are realized, the principal's conceptual knowledge is getting richer (data literacy). Thus, school principals will be more skilled in formulating programs at a later time.

6 Conclusion

Principal leadership skills have an important role in changing school conditions for the better which aims to advance the quality of education in schools. The principal's leadership skills are a demand to achieve the school's vision in the current era of the industrial revolution 4.0. Leadership skills must be possessed by a school principal to

get to an effective school. The achievement of the principal's leadership success needs to be measured through a taxonomy of leadership skills consisting of technical skills, human skills, and conceptual skills.

This study uses an explanatory survey method with the object of research focusing on the principal's leadership skills. In addition, the research population is 112 certified public elementary school teachers in Lampung. Furthermore, research data collection techniques using questionnaires and documentation. Then, aspects of the principal's conceptual skills and human skills are seen from the level of school accreditation, which is in the good category with a vulnerable score of 2.85–3.19. While technical skills are in the sufficient category with a score of 2.75. Based on research data, the level of Leadership Skills of elementary school principals in Bandar Lampung in the Technical Skills category as a reflection of technological literacy is lower than Conceptual Skills and Human Skills. Thus, the principal's technical skills are inversely proportional to human skills, while the principal's conceptual skills increase linearly during the tenure of one period.

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