

Factors Affecting Smart School Leadership Competencies of High School Principals in Vietnam

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Abstract. Leaders of high schools in the context of the fourth industrial revolution face many challenges and new opportunities. Schools need to become smarter, more flexible, and more secure, and, therefore, the principal's leadership competencies are likely to have new elements and be affected by new influencing factors. The aim of this study was to identify the factors that influence the competencies of school leadership in today's increasingly smarter school landscape. Research was conducted using qualitative and quantitative research methods. The research sample consisted of 295 high school principals from five provinces and cities in Vietnam. The results showed that smart school leadership competencies depend on individual factors, school-level factors, and educational community-level factors. Smart school development policy and innovation of smart school infrastructure and facilities were identified as the most important factors.

Keywords: high school; leadership; leadership capacity; smart school

1. Introduction

The general leadership competencies and capacities of high school principals have been identified as a decisive factor in the quality of general education (Dinham, 2005). In the present context, the smart school is a development trend of information and communication technology (ICT) in education (Wu et al., 2019).

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It is very likely, therefore, that the competency structure of the smart school principal must also have new elements.

Vietnam is a developing country that is very active in the application of information technology (IT), science, and technology in socio-economic development, including education. It has been determined that the acceleration of modern scientific and technological revolution and formulation of information society in the coming decades are placing requirements on and facilitating the development of education and training (Socialist Republic of Viet Nam, 2006, 2012). The smart school model has been proposed and tested in a number of high schools in Vietnam. However, this was not based on a specific document or instruction from the Ministry of Education and Training. Moreover, in the field of educational management, there are only a few studies on the issue of developing the smart school leadership competencies of principals, especially in the context of fundamental and comprehensive education reform under the development of the open-market economy in Vietnam.

Some previous studies have also shown that the factors affecting the school leadership competency development of principals are claimed to include age and gender, professional competence, working experience, and school organization (Chen, 2003; Piaw et al., 2014). Still, there are other factors affecting this, including policy, cultural, and community-level factors, that need to be examined with systematic evaluative research. This research need has become more urgent in the context of the fundamental and comprehensive education reform in Vietnam since 2013 with the aim of more insightful understanding and effective solutions to enhance the smart school leadership capacities of high school principals.

This research aims to evaluate the influence of the above factors on the smart school leadership capacities of high school principals in Vietnam. The paper applies existing theoretical approaches and analyzes survey data collected from several high schools in Vietnam. The research findings are expected to clarify theoretical issues and inspire solutions to the development of principals' leadership competencies in response to Vietnam's new General Education Program.

In this article, we present a summary of some basic concepts and research results related to smart schools, smart school leadership competency and some factors affecting school leadership competencies. Next, the research process, research methods and research sample are described in detail. From the results of the data analysis, we come to a number of conclusions and discussions focusing on the factors that influence smart school leadership competencies.

2. Literature Review

First, we present three key concepts of this research: school leadership, smart schools, and smart school leadership competency. Second, we analyze a number of studies related to the factors affecting smart school leadership competencies.

2.1 The concept of school leadership

As a decisive factor in maintaining the quality of school operations and learners' learning, school leadership has been examined from various research perspectives (Marks & Printy, 2003; Pont et al., 2008; Robinson et al., 2007; Silins & Mulford, 2002). It is common to conduct comparative research between school leadership and management to highlight the features of leadership. Management is defined as the ability to employ decision-making power and capacity to achieve a goal. Leadership, on the other hand, is defined as the ability of an individual or a group to exert power over and intentional influence onto others to achieve a goal (Bush, 2007; Bush & Glover, 2002; Kuhnert & Lewis, 1987; Pont, 2014; Pont et al., 2008; Yukl, 2002). According to Bush (1986, 2007), Bush and Glover (2002), and Le (2018), there are six management models, corresponding to eight leadership models. The six management models are the formal, collegial, political, subjective, ambiguous, and cultural models. The eight leadership models are the managerial, participative, transformational, transactional, postmodern, contingency, moral, and instructional models.

Many viewpoints on leadership in connection with school organization and learning improvement have been introduced. Educational leadership (Sellami et al., 2019) is represented in school leadership (Bush & Glover, 2002; Bush & Heystek, 2006) through various forms. These include transformational leadership (Allix, 2000; Leithwood & Jantzi, 2006; Leithwood & Slegers, 2006), instructional leadership (Feye, 2019; Hallinger, 2003; Southworth, 2002), constructive leadership (Kuhnert & Lewis, 1997), cultural leadership (Hallinger, 2004; Muralidharan & Pathak, 2019), teacher leadership (Berry, 2014; Harrison & Birky, 2011; Howe & Stubbs, 2001; Smylie & Denny, 1990), and change leadership (Wagner, 2018). It also includes learning leadership (Reeves, 2006), learning-centered leadership (Goldring et al., 2007), shared leadership (Lambert, 2002; Pearce & Conger, 2003; Pearce & Sims, 2000; Pearce et al., 2007), distributed leadership (Bolden, 2011; Harris, 2004; Spillane et al., 2004; Timperley, 2005), democratic leadership (Woods, 2004), situational leadership (Thompson & Glasø, 2015), system leadership (Ramosaj & Berisha, 2014), and collaborative leadership (Hallinger & Heck, 2010).

Research has shown that at the end of the twentieth century and the beginning of the twenty-first century, there was a noticeable transformation in the leadership competency model, from principals as managers to principals as managers and leaders (Pont et al., 2008; Townsend, 2011). As a result of this transition, school leadership involves the combination of transformational leadership and pedagogical (instructional and teaching) leadership. The major characteristics of the transformational leadership model are vision, restructuring, staff development, syllabus development, and external community-participation encouragement (Leithwood & Slegers, 2006). For pedagogical (instructional and teaching) leadership, major characteristics are educational goal setting, program planning, and teacher and teaching evaluation. The top priority of pedagogical leadership is promoting learners' learning outcomes, thus particularly emphasizing the task of teaching and learning management (Robinson et al., 2009).

In the new context, the current school leaders are facing a number of issues, such as public-private competition, and needs and requirements of science and technology application in management and education. School leadership must be redefined with greater autonomy and new missions of school leaders in order to improve learning quality (Potter et al., 2002; West et al., 2005). In summary, there are four school leadership missions relating to factors affecting teaching and learning quality. These are:

- (i) supporting, evaluating, and developing teachers;
- (ii) identifying, evaluating, and justifying objectives;
- (iii) managing resources strategically; and
- (iv) leading the system – leadership beyond the school level.

2.2 The concept of smart schools

'Smart' means being able to think quickly (wording) and decide and act intelligently, promptly, effectively, and powerfully to solve problems in different situations (Gardner, 2011; Kim et al., 2013; Middleton, 2015; Zhu et al., 2016). The smart school, then, is defined as a teaching and learning institution based on modern ICT to educate children to become information society citizens in response to the fourth industrial revolution (Ibrahima et al., 2013; Majeed & Yusoff, 2015; Masrom & Selamat, 2012; Omidinia et al., 2012).

The smart school is the smart educational paradigm guaranteeing four smart factors: smart educational philosophy, smart educational methods, smart educational environment, and smart learners (Zhu et al., 2016). Through the smart school, smart education processes can be organized to improve smart learning quality and efficiency. Smart learning, rather than simply learning with modern equipment and facilities, refers to self-disciplined, motivated, adaptable, resourceful, and modern technology-supported learning (Kim et al., 2013; Middleton, 2015).

In the modern age with the development of ICT, a new feature of the smart school is the use of smart technology, including hardware and software, to search, process, store, and use necessary information in different circumstances. These include the use of a virtual desktop in a smart school technology (Reychav et al., 2016) and utilizing smart devices for sending data and receiving instructions (Abdel-Basset et al., 2018).

2.3 Smart school leadership competency

Literature has shown that there are four subgroups of principal leadership competency (Pont et al., 2008). The first is technician leadership competency for effective school finance and facilities management. The second is personnel leadership competency for building safe, open, and mutually respectful relationships between teachers and learners, managers, administrative staff, and other employees in the school. The third subgroup of principal leadership competency is pedagogical leadership competency for instructing, managing, evaluating, and supervising the teaching, learning, and research activities of the school. The last subgroup is cultural leadership competency for developing a set of values and standards to improve the operational quality and efficiency of the school. Viewpoints regarding the different leadership sub-competency focuses

can vary. For instance, if pedagogical and teaching competency is prioritized, one would select a competent teacher to be appointed as the school principal. Davis and Marquis (2005) believed that principals are competent managers, which means management and administrative competencies should be the most crucial factors to consider when selecting a principal. The question is to identify new leadership competencies to meet the new requirements of smart schools in the new context. Principals of twenty-first-century schools are expected to possess leadership competencies in the school paradigm with passion, skills, knowledge, career enthusiasm, and operational strategies to maintain school efficiency (Bush, 2007; Davis & Marquis, 2005).

Principals' smart school leadership competencies are made up of several component competencies relating to different fundamental operational aspects of the school. These are teaching and learning instructional, cultural, strategic, educational managerial, and organizational managerial leadership competencies (Alvy & Robbins, 2005; Berlin et al., 1988; E-Lead, 2008; Fink & Resnick, 2001; Muralidharan & Pathak, 2019; Piaw et al., 2014; Robbins & Alvy, 2004).

2.4 Factors affecting smart school leadership competencies

The principal's leadership competencies are the decisive factor affecting the operating efficiency and learning quality of the school (Feye, 2019; Gaetane et al., 2009; Muralidharan & Pathak, 2019; Sebastiana et al., 2019; UNESCO, 2016). These competencies are subject to the principal's personal traits and institution-level factors. The principal's leadership competencies are profoundly influenced by two factors, namely years of working experience and qualified professional competence. Professional development is crucial to enhance leadership competencies prior to the appointment of principals (Chen, 2003; Piaw et al., 2014).

A literature review of existing studies on school leadership and related topics has revealed the fundamental theoretical background and research methodology for this research as follows. First, smart school leadership can be assigned either to multiple people in the school or a single individual, such as the principal, schoolboard president, or head of the school's party committee organization in the case of Vietnam. However, under the scale of this research, the factors affecting principal leadership competencies are the focus due to the principal's leading position in the school's organization as well as their decisive influence on the schools' managerial, administrative, and other staff.

Second, the term 'smart school leadership competencies' includes various components, from leadership to managerial and administrative competencies. Apparently, it is difficult to theoretically separate leadership from managerial and administrative competencies. In reality, competent management and administration are integral to strong leadership. Third, following up on the existing research, this paper focuses on the individual, school-level, community-level, and policy factors affecting smart school leadership competencies.

3. Research Methodology

Figure 1 illustrates the steps followed to conduct this research.



Figure 1: Steps employed in the research

This study employed a non-experimental research design with survey questionnaire. The respondents of the survey were high school principals. Respondents were asked to complete the questionnaire in a time of between 15 and 30 minutes. The survey sample included 295 high school principals from five cities/provinces, namely Quang Ninh, Hai Phong, Ha Noi, Ho Chi Minh City, and Hue.

Table 1 shows some general information of the respondents of this study.

Table 1. Characteristics of survey respondents (295 principals) on smart school leadership competencies

	Number	Percentage (%)
Gender		
Male	213	72.2
Female	82	27.8
Workplace		
Hanoi	99	33.6
Ho Chi Minh City	100	33.9
Other	96	32.5
Working experience (years)		
Under 10 years	18	6.1
Between 10 and 20 years	117	39.7
Over 20 years	160	54.2
Leadership experience (years)		
Under 10 years	191	64.7
Over 10 years	104	35.3
Total	295	100

The questionnaires were distributed and collected through the Department of Education and Training to the five cities/provinces. During the new school year assignment meeting in each province, school principals were convened. The questionnaires were distributed and received within the framework of each meeting. Naturally, the questionnaires were distributed only to public school principals. Finally, 295 valid questionnaires were returned and included in the analysis process.

The questionnaire comprised of 17 questions, designed on a five-point Likert scale (see Tables 2–5). The questionnaire consisted of two parts. Part 1 related to smart school leadership competencies (four questions). The variable ‘smart school leadership competencies’ was measured with four capacity indicators as follows:

- Capacity 1 (C1): inquisitiveness and pride in leading a smart school;
- Capacity 2 (C2): adaptability to technology and artificial intelligence- (AI) driven changes in education and life;
- Capacity 3 (C3): influence on school staff as an example of smart gadget and advanced technology usage;
- Capacity 4 (C4): seeking for external support to one’s own smart school leadership competencies; and
- Capacity 5 (C5): Overall competencies (average of the four component competencies) was also measured as follows: $C5 \text{ (all)} = C1 + C2 + C3 + C4/4$.

Part 2 related to the factors affecting the competencies of smart school leaders (13 questions). These 13 factors were divided into three groups as follows:

- Group 1: individual factors, including F1) knowledge, F2) strategic thinking, and F3) adaptability to modern technology and information;
- Group 2: school-level factors, including F4) requirements for smart school development, F5) smart school development resources, F6) teaching staff engagement, F7) teaching staff and other employees’ IT competence, F8) students’ IT competence, and F9) IT infrastructure;
- Group 3: community-level factors, including F10) government education policies, F11) Ministry of Education and Training policies, F12) community culture, and F13) approval of families and other educational parties; and

The overall factor (F14 – the average of all 13 aforementioned factors) was also measured as follows: $F14 \text{ (all)} = F1 + F2 + F3 + \dots + F13/13$.

4. Research Results

In this section, the research results are presented, starting with the smart school leadership competencies of principals. The section continues with the factors influencing the smart school leadership competencies of principals, with each group discussed separately. Lastly, a correlation is made between the factors and competencies.

4.1 Principals’ self-evaluation on their own smart school leadership competencies

Respondents’ rating of their smart school leadership competencies are depicted in Table 2. The majority of the principal respondents evaluated their component and overall competencies as good and very good. The competency with the highest mean (4.42) was inquisitiveness and pride in leading a smart school (C1), whereas the lowest mean (4.23) was attributed to C4 (seeking for external support to one’s own smart school leadership competencies).

Table 2. Component and overall leadership competencies of principals

	Principal competency	N	Min	Max	Mean	SD
C1	Inquisitiveness and pride in leading a smart school	295	1	5	4.42	0.695
C2	Adaptability to technology and AI-driven changes in education and life	295	1	5	4.30	0.684
C3	Influence on school staff as an example of smart gadget and advanced technology usage	295	2	5	4.34	0.685
C4	Seeking for external support to one's own smart school leadership competencies	295	2	5	4.23	0.685
C5 (all)	Overall competencies (average of the four component competencies)	295	1.5	5	4.32	0.597

4.2 Factors affecting the development of leadership competencies

The questionnaire results on Group 1 (individual factors) are displayed in Table 3. All three individual factors were highly appreciated by the respondents as significantly and greatly influencing smart school leadership competencies, with the highest level of influence attributed to F1, 'principals' awareness of and interest in smart school development' (mean = 4.52).

Table 3. Influence of individual factors

	Individual factor	N	Min	Max	Mean	SD
F1	Awareness of and interest in smart school development	295	2	5	4.52	0.709
F2	Strategic thinking to develop smart schools	295	2	5	4.48	0.718
F3	Adaptability to modern technology and information and competence of IT application in school leadership	295	1	5	4.28	0.829

With regards to school-level factors (Group 2), results are depicted in Table 4. The respondents considered all six factors in this group as having a significant or great influence on smart school leadership competencies. The factor of 'infrastructure of IT and smart equipment' (F9) was rated as the most influential factor in this group (mean = 4.36) (Table 4)

Table 4. Influence of school-level factors

	School-level factor	N	Min	Max	Mean	SD
F4	Gaps between smart school development objectives and managerial, teaching, and working staff's experience in using modern IT and smart equipment	295	2	5	4.12	0.741
F5	Ability to mobilize and exploit the school's resources or finance and infrastructure of IT for smart school development	295	2	5	4.26	0.762

F6	Teaching and non-teaching staff's awareness of and interest in smart schools	295	2	5	4.25	0.732
F7	Teaching and non-teaching staff's readiness for and competence in applying modern IT and equipment	295	2	5	4.22	0.698
F8	Learners' readiness for and competence in applying modern IT and equipment	295	2	5	4.19	0.750
F9	School's infrastructure for IT and smart equipment system for smart school development	295	2	5	4.36	0.804

Community-level factors include government education policies, the Ministry of Education and Training's policies, community culture, and the approval and support of families and other educational parties. The results of this group (3) are depicted in Table 5. Respondents claimed all the factors in this group to be considerably or very influential in developing smart school leadership competencies. The factor 'government and provincial authorities' educational policies and attention' (F10) was regarded as the most influential factor (mean = 4.51).

Table 5. Influence of educational community-level factors

	Community-level factor	N	Min	Max	Mean	SD
F10	Government and provincial authorities' educational policies and attention	295	2	5	4.51	0.728
F11	Ministry of Education and Training's smart school development policies and attention	295	2	5	4.50	0.760
F12	Community culture and local level of application of modern IT and smart equipment	295	1	5	4.03	0.820
F13	Approval and support from families and relevant parties to optimize the use of current IT and smart gadgets in teaching and education	295	1	5	4.25	0.787
F14 (all)	The overall factor (average of all 13 abovementioned factors)	295	2	5	4.31	0.561

4.3. Correlation between the factors and competencies of smart school leadership

The Pearson correlation results between the four capacities and the first nine factors (Groups 1 and 2) are presented in Table 6. Both individual and school-level factors obtained correlations with high statistical significance (0.01) with smart school leadership competencies. Capacity 1 (principals' inquiring competency) obtained the strongest correlation with F1 (principals' awareness) (.336). Capacity 2 (principals' adaptability) correlated strongly with F9 (IT infrastructure) (.323). The results for C3 (principal setting a good example) showed a strong correlation between this capacity and F2 (strategic

thinking) (.348). For C4 (seeking for external opportunities), the strongest correlations were established with F3 and F8 (adaptability and students' IT competency, respectively) (.293 for both values). Moreover, the overall capacity in the principals' smart school leadership competencies, C5 (all), had the highest correlation with F4 (requirements for smart school development) (.380).

Table 6. Pearson correlation between individual and school-level factors and smart school leadership competencies

	C1	C2	C3	C4	C5 (all)	F1	F2	F3	F4	F5	F6	F7	F8	F9
C1	1	.706**	.715**	.562**	.859**	.336**	.319**	.250**	.295**	.253**	.265**	.302**	.230**	.323**
C2	.706**	1	.708**	.653**	.882**	.341**	.337**	.323**	.364**	.326**	.312**	.308**	.327**	.367**
C3	.715**	.708**	1	.701**	.898**	.280**	.348**	.263**	.321**	.236**	.239**	.298**	.227**	.306**
C4	.562**	.653**	.701**	1	.838**	.221**	.227**	.293**	.341**	.257**	.205**	.242**	.293**	.284**
C5 (all)	.859**	.882**	.898**	.838**	1	.339**	.354**	.325**	.380**	.308**	.294**	.331**	.310**	.368**
F1	.336**	.341**	.280**	.221**	.339**	1	.787**	.479**	.501**	.474**	.603**	.564**	.481**	.605**
F2	.319**	.337**	.348**	.227**	.354**	.787**	1	.495**	.445**	.509**	.501**	.531**	.461**	.560**
F3	.250**	.323**	.263**	.293**	.325**	.479**	.495**	1	.414**	.372**	.420**	.430**	.400**	.453**
F4	.295**	.364**	.321**	.341**	.380**	.501**	.445**	.414**	1	.503**	.526**	.565**	.509**	.548**
F5	.253**	.326**	.236**	.257**	.308**	.474**	.509**	.372**	.503**	1	.541**	.593**	.585**	.546**
F6	.265**	.312**	.239**	.205**	.294**	.603**	.501**	.420**	.526**	.541**	1	.609**	.545**	.610**
F7	.302**	.308**	.298**	.242**	.331**	.564**	.531**	.430**	.565**	.593**	.609**	1	.653**	.626**
F8	.230**	.327**	.227**	.293**	.310**	.481**	.461**	.400**	.509**	.585**	.545**	.653**	1	.552**
F9	.323**	.367**	.306**	.284**	.368**	.605**	.560**	.453**	.548**	.546**	.610**	.626**	.552**	1

** . Correlation is significant at the 0.01 level (2-tailed). N = 295

The Pearson correlation results between the four capacities and the last four factors (Group 3) and the overall factor are presented in Table 7. The community-level factors also obtained close correlations with the smart school leadership competencies of the respondents, with high statistical significance (0.01). Factor 10 (government and local authorities' attention and policies to develop smart schools) was found to be the most influential component and overall smart school leadership competency of principals (with a mean value of 4.51).

Table 7. Pearson correlation between community-level factors and overall factor and smart school leadership competencies

	C1	C2	C3	C4	C5 (all)	F10	F11	F12	F13	F14 (all)
C1	1	.706**	.715**	.562**	.859**	.437**	.436**	.339**	.362**	.430**
C2	.706**	1	.708**	.653**	.882**	.437**	.426**	.358**	.402**	.481**
C3	.715**	.708**	1	.701**	.898**	.419**	.377**	.343**	.353**	.416**
C4	.562**	.653**	.701**	1	.838**	.326**	.246**	.320**	.335**	.374**
C5 (all)	.859**	.882**	.898**	.838**	1	.466**	.427**	.391**	.417**	.489**
F10	.437**	.437**	.419**	.326**	.466**	1	.780**	.558**	.485**	.747**
F11	.436**	.426**	.377**	.246**	.427**	.780**	1	.530**	.487**	.775**
F12	.339**	.358**	.343**	.320**	.391**	.558**	.530**	1	.445**	.659**
F13	.362**	.402**	.353**	.335**	.417**	.485**	.487**	.445**	1	.768**
F14 (all)	.430**	.481**	.416**	.374**	.489**	.747**	.775**	.659**	.768**	1

Note: **. Correlation is significant at the 0.01 level (2-tailed). N = 295

5. Discussion

The term 'smart' and the component competencies of smart school leadership are far from unfamiliar under reform school leadership in Vietnam. As a result, the respondents rated their own smart school leadership competencies as very good, with an average of 4.3/5.

In this study, the factors affecting smart school leadership competencies were classified into three level-based groups: micro-level (individual), meso-level (school), and macro-level (community). Analysis results showed these factors as attributors to Vietnamese high school principals' smart school leadership competencies. The most influential factor at the individual level was found to be related to professional development. At school level, the most influential factor was related to IT infrastructure and equipment improvement. At community level, the factor of government and local authorities' policies on smart school development was determined the most influential factor.

The findings exhibiting strong correlations between these factors and smart school leadership competencies in this study align with existing research acknowledging leadership competencies as an attribute of school organization (Ogawa & Bossert, 1995). Nevertheless, when studying and evaluating the development of smart school leadership competencies and the factors affecting it, it is crucial to take into account the context of fundamental and comprehensive education and training reform in Vietnam since 2013. The training of educational managerial staff, including principals, was designed to develop staff competencies, including 'smart competencies'. This is amongst the objectives of this reform in response to the new learners' competency-based General Education Program.

Traditionally in Vietnam, smart means the capacity to identify and solve problems quickly and effectively; yet, in this research, smart refers to the competencies to apply modern IT such as smartphones, computers, and internet-connected multimedia facilities and digital resources. In the 2003/2004 school year in Vietnam, one pilot 'smart classroom' was installed in a primary school in Dong

Trieu district, Quang Ninh province. In that smart classroom, teachers and students used modern internet-connected multimedia facilities such as computers, interactive boards, and camera systems in teaching and learning. All 79 schools in this district now have at least one smart classroom (Vu, 2018). Meanwhile, the project of developing smart schools has also been launched in some big cities in Vietnam, including Ho Chi Minh City and Hai Phong. It has been demonstrated both internationally and in Vietnam that managerial staff, especially principals, possessing smart school leadership competencies is a prerequisite for setting up a smart school.

Self-evaluation of the participating principals regarding their smart school leadership competencies yielded the level 'good', which should be interpreted as equal to knowledge and comprehension, the two basic levels in Bloom's Taxonomy (Bloom et al., 1956). This means that the respondents were well aware of the component competencies of smart school leadership. These competencies, however, are subject to further practice and development in the actual process of setting up and developing the smart school. In other words, high school principals' self-evaluation of smart school leadership competencies as 'good' should be considered a prerequisite for smart school development. To develop the competencies in question, it is necessary to carry out projects to influence the relevant factors. This may especially take the form of developing policies and programs for smart school development, renovating smart school infrastructure and equipment, and training principals in their smart school leadership competencies.

6. Conclusion

This study has indicated that high school principals in Vietnam tend to be confident in their smart school leadership competencies despite only a few 'smart classes' and pilot smart school projects in several cities. Aligning with previous studies, the findings also highlighted that smart school leadership competencies are dependent on individual factors, school-level factors, and educational community-level factors. Smart school development policies and smart school infrastructure and facilities innovation were identified as the most critical factors affecting smart school leadership competencies. The results of this research have emphasized the need to develop principals' smart school leadership competencies to contribute to smart school development in accordance with practical conditions.

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