



**The Effect of Principals' Instructional Leadership on the 21st Century
Teaching Competencies as Perceived by Teachers in
New Generation Schools in Cambodia**

Somachita Phal

**A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of
Master of Education in Educational Administration**

Prince of Songkla University

2023

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ABSTRACT

This aims of this study were to 1) study the level of principals' instructional leadership of New Generation Schools, 2) study the level of teachers' 21st century teaching competencies in New Generation Schools, and 3) examine the effect of principals' instructional leadership on teachers' 21st century teaching competencies in New Generation Schools. This study employed a quantitative research design with a survey technique. The questionnaires were designed in 5-points Likert scale. The research informants consisted of 223 teachers of New Generation Schools in Cambodia and were selected by using proportional stratified random sampling method. Descriptive statistical analysis showed that the level of principals' instructional leadership of New Generation Schools is high and the level of teachers' 21st century teaching competencies in New Generation Schools is also high. Furthermore, the multiple regression analysis showed that the principals' instructional leadership contributed a positive significant impact on teachers' 21st century teaching competencies in New Generation Schools ($R^2 = .677$, $p = .000$). The finding also revealed that the three components, including Managing Curriculum and Instruction, Driving Data to Make Instructional Decision and Sharing Leadership are the best predictors respectively. Thus, this study suggests that school principals should focus their instructional leadership practices on managing curriculum and instruction, driving data to make instructional decision and sharing leadership with their teachers, which subsequently improve and enhance the 21st century teaching competencies of teachers.

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LIST OF APPREVIATIONS

AITSL	Australian Institute for Teaching and School Leadership
ASEAN	Association of Southeast Asian Nations
DOE	District Office of Education
ICT	Information and communication technology
MoEYS	Ministry of Education, Youth and Sports
NGS	New Generation School
OECD	Organization for Economic Cooperation and
Development	
OFID	Fun for International Development
OPEC	Organization of the Petroleum Exporting Countries
PLC	Professional Learning Community
POE	Provincial Office of Education
REB	Rwanda Education Board
SEAMEO-INNOTECH	Southeast Asian Ministers of Education Organization Regional Centre for Educational Innovation and Technology
SEA-TCF	Southeast Asia- Teachers Competence Framework
STEM	Science, Technology, Engineering, and Mathematics
UNESCO	United Nations Educational, Scientific and Cultural Organization

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CHAPTER 1

INTRODUCTION

1. Rational and Problem of Study

The industrial revolutions are placing new demands on education which require a significant and thorough renovation. Many ASEAN nations are becoming increasingly aware of these concerns related to the issues of economic rivalry as well as the growing relevance of information and technology-based sectors (Bredenberg, 2018). Educational innovation must therefore be invented to prepare students with 21st century life skills to cope with the current economic issue and technology advancement era.

However, the performance of Cambodian students in STEM fields has raised serious concerns for the country's planners despite the development of global technology advancement, highlighting questions about Cambodia's ability to properly engage in the regional and global economy. Analysts estimated that less than 10% of Cambodians pursue STEM degrees, which is significantly less than the OECD average of 24.7% (Bredenberg, 2018). In addition, the issue was best illustrated by the unsatisfactory results that Cambodian students achieved on the National Leaving Test in Grade 12, where failure rates in mathematics, chemistry, and biology were at least 50% (MoEYS, 2016). Furthermore, it was noticed that high levels of public unhappiness with ongoing inefficiencies in secondary school education arose and are mostly manifested by a middle-class outflow from public schools and flat net enrollment rates (Bredenberg, 2018). These trends highlighted the urgent need for more investment in education at all levels, particularly at secondary schools where fundamental STEM abilities are acquired. The new Minister of Education, who took over the MoEYS in 2013, moved quickly to create and implement the new reforms, including the support for autonomous public schools known as the Charter School movement. These have made way for one of Cambodia's most radical initiatives to enhance the educational standards of public secondary schools with the freedom of innovation. In the context of Cambodia, Charter School is more generally referred to as New Generation School which is one of an official pillar of the MoEYS's new reform plan (Bredenberg, 2018).

The goal of creating New Generation Schools is to provide students' access to high-quality education. The New Generation School Policy provided teachers and students with guidance on how to better comprehend cutting-edge instructional methods, including constructivist and problem-based learning. The amount of innovative teaching in New Generation Schools will rise dramatically as a result of the use of these methods. Therefore, New Generation School idea is expected to boost the Kingdom's educational system and make it possible to produce a workforce with 21st century capabilities, which refers to the levels of proficiency in the STEM sectors (Science, Technology, Engineering, and Mathematics) (MoEYS, 2019). As the new innovation schools exemplar, New Generation Schools are eligible for substantial funding as long as they can maintain the accreditation with high standards of governance. However, New Generation School may lose its accreditation, as New Generation School, if it is revealed that it cannot comply with important performance criteria, including no private tutoring or enhanced library services (MoEYS, 2019).

Effective schools reinforce the notion that the principal plays a crucial role in improving student academic success (Hallinger and Heck, 2012; Horn, 2020). Principals contribute significantly and tangibly to teachers' effectiveness and students' learning (Murphy and Hallinger, 1992; Leithwood et al., 2008; Leithwood et al., 2010; Robinson, 2011; and Day and Sammons, 2022). The quality of school leadership substantially contributes to student learning (Bush, 2012). While, MoEYS in Cambodia outlined several action plans to improve school principals' leadership capacities which one of them being the development of school principals' standards (MoEYS, 2015). Instructional leadership is one of the leadership competency domains for school principals promoted by MoEYS in Cambodia and consistent with the Competency Framework for Southeast Asian School Heads 2014 edition (Horn, 2020). Meanwhile, there are also numerous research supported that strong instructional leadership is a crucial factor in a successful school and has an impact on students learning (Edmonds, 1979; Pan et al., 2015; Hallinger et al., 2017; Harris et al., 2017; Pan et al., 2017).

Instructional principals have an impact on a school's educational program when they respond to the formulation of specific goals and convey them to school personnel (Fancera and Bliss, 2011). Instructional principal's job is to oversee the effective

implementation of the curriculum by teachers and to lay a significant emphasis on the school setting and culture, which can have an impact on both the performance of instructors and students (Hallinger, 2005). In addition, instructional leadership aims to align the classroom setting with the curriculum (Gulcan, 2012). Most importantly, the instruction will be prioritized and modernized when instructional leaders acknowledge the different ways of student learning, create social and interactive learning settings in the classroom, promote learning expertise, inspire teachers and students to be professional learners, and provide learning support (Gulcan, 2012). While, some previous literature (e.g., Ismail, Don, and Khalid, 2018; Ismail, Mansor, Iksan and Nor, 2018) found that principals' instructional leadership impact on the teacher's teaching competencies.

The motive for selecting this study topic is then affirmed by the following main rationales. First, it is motivated by the recognition that leadership and management skills of educational personnel, particularly school principals, are essential to the quality of schooling (Hang, 2018). Governance is what makes sure that there are qualified, driven, and responsible teachers put into place to ensure that students will have access to high-quality learning. The principal's instructional leadership is being promoted in some countries in Asia (Horn, 2020) as well as supported by researchers (e.g., Edmonds, 1979; Hallinger, 2005; Pan et al., 2015; Hallinger et al., 2017; Harris et al., 2017; Pan et al., 2017) is seen as an effective leadership practice which promote the quality of instruction. In the study of Ismail, Don, and Khalid (2018) studied the effect of instructional leadership on teachers' functional competencies, and Ismail, Mansor, Iksan and Nor (2018) studied the influence of instructional leadership on science teaching competencies, which found that the principal's instructional leadership retain the positive impact on both cases. However, research about the effect of principals' instructional leadership on teachers' 21st century teaching competencies remains relatively scarce, particularly in Cambodia. There are not many researchers who have conducted research related to this topic. Another rationale is based on researcher's personal interest in principals' instructional leadership. New Generation Schools are referred to as innovative schools in Cambodia that prioritize modern instruction. Also, as it was stated in New Generation Schools operational policy guidelines, teachers in

NGSs are encouraged to apply novel instructional approaches (MoEYS, 2019). As so, principals of New Generation Schools might have adapted instructional leadership styles to help teachers in their best teaching practice. Therefore, it sparked the researcher's interest to conduct a study on the topic of "The Effect of Principals' Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in New Generation Schools in Cambodia."

2. Research Objectives

The purposes of this study were as follows:

1. To study the level of principals' instructional leadership of New Generation Schools.
2. To investigate the level of teachers' 21st century teaching competencies in New Generation Schools.
3. To examine the predictors of principals' instructional leadership affecting teachers' 21st century teaching competencies in New Generation Schools.

3. The Importance and Benefits of Research

The research study about "The Effect of Principals' Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in New Generation Schools in Cambodia" supported the significance as follows:

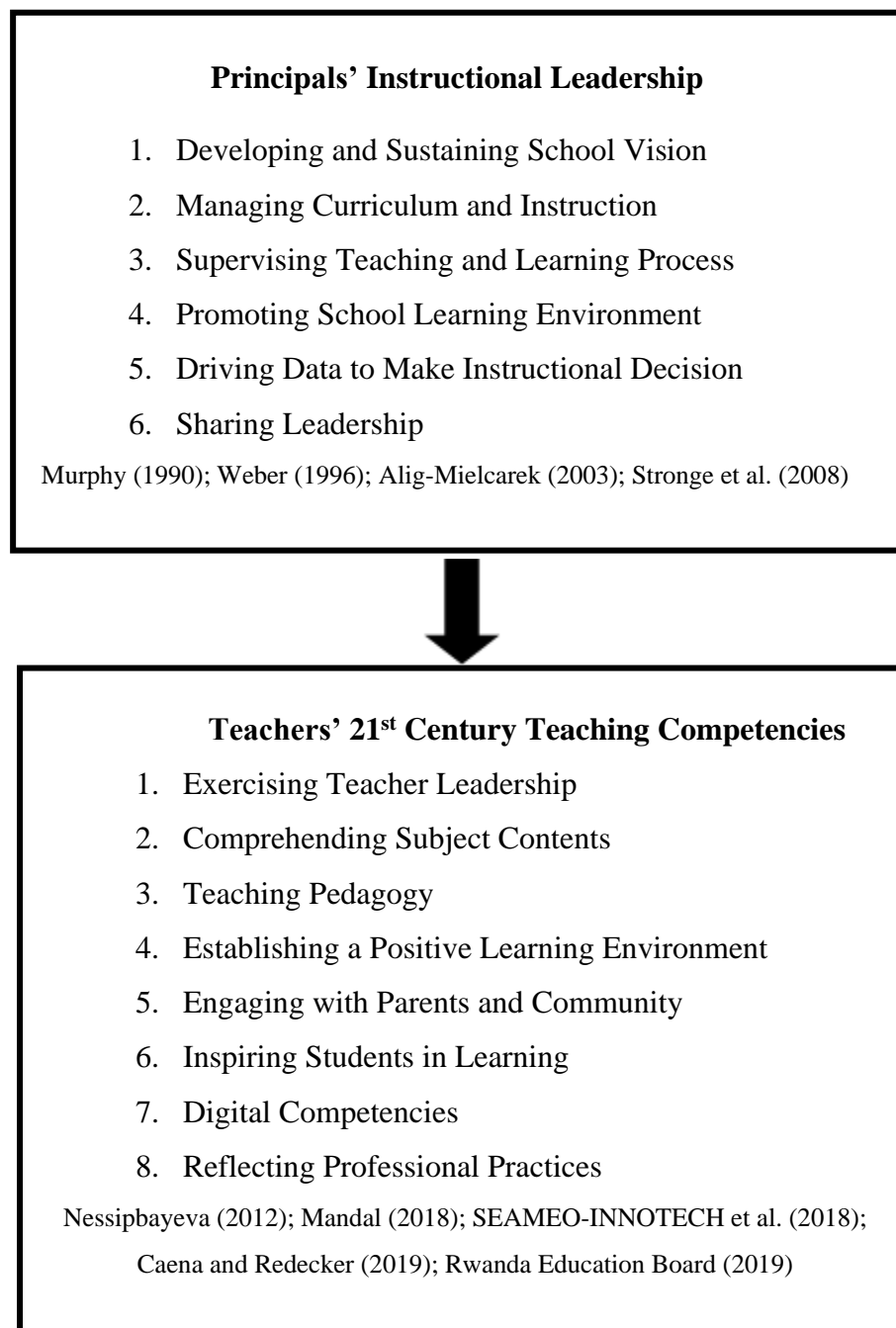
1. School principals use the study results to enhance their instructional leadership practices and use it as a guideline to support teachers in their teaching process.
2. Teachers could improve their instructional technique through implementing the 21st century teaching competencies effectively.
3. Provincial department of education utilize the results for managing and defining the training courses to develop teachers' instruction to enhance student learning.

4. Conceptual Framework

The conceptual framework of this study consists of two related concepts such as: Principals' Instructional Leadership and Teachers' 21st Century Teaching Competencies.

The concepts of principals' instructional leadership was synthesized from Murphy (1990), Weber (1996), Alig-Mielcarek (2003) and Stronge et al. (2008) so that it consists of 6 components: 1) Developing and Sustaining School Vision, 2) Managing Curriculum and Instruction, 3) Supervising Teaching and Learning Process, 4) Promoting School Learning Environment, 5) Driving Data to Make Instructional Decision and 6) Sharing Leadership.

In addition, the concepts of teachers' 21st century teaching competencies was synthesized from Nessipbayeva (2012), Mandal (2018), SEAMEO-INNOTECH et al. (2018), Caena and Redecker (2019) and Rwanda Education Board (2019), and it consists of 8 components: 1) Exercising Teacher Leadership, 2) Comprehending Subject Contents, 3) Teaching Pedagogy, 4) Establishing a Positive Learning Environment, 5) Engaging with Parents and Community, 6) Inspiring Students in Learning, 7) Digital Competencies and 8) Reflecting Professional Practices (See the analysis and synthesis of these concepts in chapter 2).

Figure 1: Conceptual Framework

5. Scope of the Study

5.1 Scope of contents

The research study about the “The Effect of Principals’ Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in New Generation Schools in Cambodia”. The researcher synthesized the concepts of principals’ instructional leadership from different scholars such as Murphy (1990), Weber (1996), Alig-Mielcarek (2003), and Stronge et al. (2008). The components of principals’ instructional used in this study are as follows:

- 1) Developing and sustaining school vision
- 2) Managing curriculum and instruction
- 3) Supervising teaching and learning process
- 4) Promoting school learning environment
- 5) Driving data to make instructional decision
- 6) Sharing leadership

After that the researcher studied the concepts and theories of teachers’ 21st century teaching competencies from the predominate framework of Nessipbayeva, (2012), Mandal, (2018), SEAMEO-INNOTECH et al. (2018), Caena and Redecker, (2019), and Rwanda Education Board (2019). The eight components of teachers’ 21st century teaching competencies are emerged as follows:

- 1) Exercising teacher leadership
- 2) Comprehending subject contents
- 3) Teaching pedagogy
- 4) Establishing a positive learning environment
- 5) Engaging with parents and community
- 6) Inspiring students in learning
- 7) Digital competencies
- 8) Reflecting professional practices

5.2 Scope of population

The sample population in this study incorporated 502 teachers from 10 New Generation Schools which are public primary and secondary school under the jurisdiction of MoEYS in Cambodia.

There were a total of 223 teacher informants who work at New Generation Schools in Cambodia.

6. Limitation of the Study

The number of the informants in this study is limited. Only 223 teachers from 10 New Generation Schools participated in the survey. The findings from this small number of participants might not be generalized.

7. Definition of Key Terms

1. Instructional leadership: It refers to a model of school leadership in which the principal collaborates with teachers to support and direct the development of best teaching practices. Through using this leadership style, principal interacts with school personnel and jointly establish definite objectives to improve student's learning and achievement.

1.1 Developing and sustaining school vision: It is principal's responsibility in defining the mission, including formulating data-driven shared goals with the school personnel for the entire school development by choosing the areas on which school personnel will concentrate their efforts and resources during a given school year, while persistently communicate those goals to all stakeholders.

1.2 Managing curriculum and instruction: It refers to the way that principal interacts among teachers within and across grade levels to coordinate curriculum in instruction in line with the school's mission.

1.3 Supervising teaching and learning process: It refers to the actions of the instructional principal engages in the academic program, including being accessible throughout the school, connecting with students and teachers, recognizing and giving feedback on the achievements of teachers, students, and the community, also assuring that the school's instructional time is not disrupted.

1.4 Promoting school learning environment: It highlights the capacity of the principal to create of a safe, inspiring, and conducive learning atmosphere where teachers and students enjoy teaching and learning activities, while keep maintaining a positive learning attitude in school.

1.5 Driving data to make instructional decision: It emphasizes the ability of principal to use evidence-based data in instructional decision-making which align with school goals for student achievement, teacher development and school improvement.

1.6 Sharing leadership: It means the ability of principals to inspire teachers to contribute and participate in school-wide decisions.

2. Teachers' 21st century teaching competencies: It is the collection of abilities, knowledge, behavior, and traits that enable successful performance of teacher to deal with current educational situation.

2.1 Teacher leadership: It is the capacity of teachers to display administrative role insight or oversight the classroom regarding managing effective classroom, participating in school professional activities, evolving in professional development, building professional relationship, implying educational policies and exhibiting moral standard.

2.2 Comprehending subject contents: It emphasizes the capacity of teachers to acknowledge their subject-matter expertise and know how to integrate between the subject contents with 21st century skills in order to provide students with new knowledge.

2.3 Teaching pedagogy: It refers to the capacity of teachers to create learning goals and outcomes, measure and evaluate students' progress, and use assessment data to inform teaching and learning.

2.4 Establishing a positive learning environment: It refers to the capacity of teachers to promote a physical and mental health learning environment where students feel comforted, inspired and enjoy learning.

2.5 Engaging with parents and community: It emphasizes the capacity of the teacher to evolve students' families and community in their children's learning, while putting effort to cooperate and interact with all related stakeholders to create trust and link students' learning between home and school.

2.6 Inspiring students in learning: It is the capacity of teachers to encourage their students to learn through offering multiplicity of teaching and learning strategies. Hence, teachers prepare clear lesson plans, allocate a variety of resources, integrate

technology in their teaching process, and monitor students' progress regularly in order to assist help for students when needed.

2.7 Digital competencies: It refers to the ability of teachers to recognize when and how to employ technology in educational to improve student learning.

2.8 Reflecting professional practices: It is the ability of teachers to ensure the efficiency of professional work and teaching through evaluating their own professional practice. Thus, teachers observe on students' progress and their professional grow regarding integrating new teaching strategies with technology and building connection with stakeholders.

3. New Generation Schools: It refers to the new reforming schools, autonomous public school, which inaugurated by MoEYS Cambodia.

CHAPTER 2

LITERATURE REVIEW

This chapter presents the relevant literature reviews related to the concepts, theories, and previous research studies of principals' instructional leadership and teachers' 21st century teaching competencies. The literature reviews have been grouped as follows:

1. Instructional Leadership
 - 1.1 The definition of instructional leadership
 - 1.2 The importance of instructional leadership
 - 1.3 The concepts and theories of instructional leadership
 - 1.4 The components of instructional leadership
 - 1.5 Factors for developing instructional leadership
2. Teachers' 21st Century Teaching Competencies
 - 2.1 The definition of teachers' 21st century teaching competencies
 - 2.2 The importance of teachers' 21st century teaching competencies
 - 2.3 The concepts and theories of teachers' 21st century teaching competencies
 - 2.4 The components of teachers' 21st century teaching competencies
3. The Relationship between Instructional Leadership and Teachers' 21st Century Teaching Competencies
4. Education System and Educational Reforms: Charter Schools in Cambodia
5. New Generation Schools in Cambodia
6. Related Research Studies

1. Instructional Leadership

1.1 The definition of instructional leadership

There are two fundamental concepts about instructional leadership, one of which is specific and the other broad. According to the specific definition of instructional leadership, it includes activities like conducting classroom observations that are directly relevant to teaching and learning whereas the broad definition of instructional leadership encompasses all forms of leadership that indirectly influence student learning, such as shaping school policies and timetabling practices. These could be seen as qualities of leadership influence the standard of the curriculum and instruction affecting the student learning (Sheppard, 1996).

According to Hallinger and Murphy (1985), instructional leadership is the behavior of the principal that aims to promote and improve the teaching and learning process in the school and involves parents, teachers, students, school planning, school management, and school buildings and resources in school development process.

In Lashway (2002) mentioned that the current definitions of instructional leadership are more comprehensive than those from the 1980s. Originally, the role of principals involved tasks such as setting clear goals, allocating resources in instruction, managing curriculum, monitoring lesson plans, and evaluating teacher performance. Nowadays, it encompasses a lot more in-depth engagement with the core technologies of teaching and learning, contains more sophisticated perspectives on professional development, and places a lot of emphasis on the use of data in decision-making.

Alig-Mielcarek (2003) stated that instructional leadership comprises of principal behaviors with high expectations and clear goals for the performance of students and teachers, monitor, and provide feedback regarding the technical core (teaching and learning) of schools, provide and promote professional growth for all staff members, and help create and maintain a school climate of high academic press.

In Lambert (2003) study claimed that the days of the alone instructional leader are over. We no longer believe that one administrator can serve as the instructional leader for the entire school without the substantial participation of other educators. Thus, a variety of authors such as Jackson (2000), Lambert (2003), Marks and Printy (2003) tried to combine these concepts into what they refer to as “shared instructional

leadership” which principals and teachers work together to ensure the quality of student learning.

Stronge et al. (2008) mentioned that the principal’s strong and direct participation in teaching and learning can be used to simply define instructional leadership. Principals who take on the role of instructional leaders are quite involve in curriculum and instruction related issues which have a direct impact on student progress.

Masumoto and Brown Welty (2009) mentioned that the impact of principals on students’ academic performance is the object of instructional leadership. It was viewed that the instructional leadership positively affects teachers’ outcomes of teaching, and the raises of learner performance. Similarly, Daresh (2007) and Elmore (2000) proposed that the instructional leadership is the type of leadership that ought to direct and guide instructional improvements which linked to student performance.

In the study of Ylimaki (2014) proposed that teachers and other supported staffs play an important leadership role in enhancing teaching and learning and further mentioned that instructional leadership is not the only responsibility of school principals alone. A shared or integrated approach comparable to this conceptualizes instructional leadership as a capacity for school improvement in which the principals exhibit suitable instructional leadership behaviors and welcomes teachers and others to join their efforts to alter and enhance teaching methods.

Brolund (2016) indicated instructional leadership as a style of school leadership where school principals collaborate with teachers to promote and supervise the development of best teaching practices. School principals use this leadership style to collaborate with teachers and mutually define precise objectives concerning students’ achievement. In this paradigm, school principals provide support to teachers by offering professional development opportunities so that teachers can discover the ideal teaching methods, as well as coaching and mentoring to those teachers who need it. The consistent collaboration between school principals and teachers is to increase effectiveness in the classroom teaching.

In this study, instructional leadership refers to a model of school leadership in which the principal collaborates with teachers to support and direct the development of

best teaching practices. Through the uses of this leadership style, principals interact with school personnel and jointly establish definite objectives to improve students' learning and achievement.

1.2 The importance of instructional leadership

It is clear that the focus of schools is on teaching and learning, which contributes to the success of school development. This requires school principals to be knowledgeable about up-to-date teaching and learning strategies. The involvement of school principals to enhance the quality of teaching and classroom management are noticed as dramatically rising in school reforming process (Blasé and Blasé, 1998). In the 1970s, the priority of schooling shifted from managing inputs and systems to improving student learning outcomes. By the mid-1980s, nearly all schools in the United States had adopted the initiative aimed at improving the leadership skills of school leaders. A new ideology reflecting an effective school's view of leadership has been thrown at school leaders (Tucker and Coddling, 2003).

There is a strong and widespread claim by scholars that modern school principals should consistently view instructional leadership as their primary responsibility and top priority. It stems from the empirical relationships between principals' commitment to high quality instruction and student achievement (Shaked, 2018). There is a huge amount of evidence showing that a strong instructional principal is a crucial factor of a successful school (Edmonds, 1979; Purkey and Smith, 1983). Lately, the broader research study about the impact of instructional leadership on students learning has aroused in many countries in Asia (Hallinger et al., 2017; Harris et al., 2017; Pan et al., 2015; Pan et al., 2017).

The instructional principals are considered as the main indicator that determines how much a teacher can develop or improve their professional work (Barth, 1990). It was noted that school principals must have a high level of knowledge about teaching and learning, especially competencies based on the characteristics of successful schools. The expectation was that raising awareness among school principals would change the management structure toward one more focused on instructional practices (Tucker and Coddling, 2003).

Alig-Mielcarek and Hoy (2005) suggested in their study that a multi-year case study evaluating systemic school reform shows how a unique school adapted to both

top-down curriculum regulation and discretion at the local level to successfully deal with the mutual pressures of rigorous testing and standards-based education. The proper compromise between leadership and autonomy at the school level was made possible in large part by decisions made at the district level. The school culture emphasized caring for people while striving for productivity, including shared goals, safety, creativity, and collegial support. This required school principals to practice instructional leadership.

Reitzug, West and Angel (2008) mentioned that principals' roles in instructional leadership have traditionally been to communicate high expectations to school personnel and students, monitor lesson plans, track test scores and student growth, coordinate the school's curriculum, foster a culture of learning, and create a positive work environment. Principals' instructional leadership nowadays places more emphasis on the principal as a facilitator for teacher progress as opposed to the principal as an examiner of teacher competency. This transition has been facilitated through collaborative inquiry with teachers, the establishment of discussion forums, professional development, and the development of professional learning communities.

Goddard, Goddard, Sook and Miller (2015) stated that leadership and teacher cooperation contribute to school performance by fostering a sense of collective efficacy among all the teachers in the school. The principal's instructional leadership promotes the extent to which teachers collaborate to improve instruction. The researcher found that leadership has a significant direct impact on teacher's collaboration. Leadership and collaboration were also found to predict attitudes on collective efficacy. Finally, attitudes toward the collective efficacy of schools were found to directly predict achievement gaps, while instructional leadership and teacher collaboration indirectly predicted achievement gaps. These findings suggest that effective instructional leadership can develop structures that support student learning.

In conclusion, the role of instructional leadership in promoting educational quality should not be ignored, given the experimentally demonstrated value of instructional leadership in managing educational transitions. It is believed that the management of change in 21st century education depends heavily on the employment of instructional leadership. Therefore, school principals who take on instructional

leadership positions must work to be high-impact leaders in order to effectively oversee the implementation of school transformation.

1.3 The concepts and theories of instructional leadership

The advent of studies on successful and failing urban elementary schools in North America five decades ago sparked a preliminary theoretical study into the role of instructional leadership (Bridges, 1967). The effective school research concentrated on identifying how instructional leaders supported student learning, in contrast to earlier studies that had focused on the socioeconomic position of students as the indication of student achievement (Edmonds, 1979). Since that time, scholars in Western countries have investigated the nature and effects of instructional leadership on the quality of teaching and learning (Hallinger, 2011). The growth of instructional leadership studies emerged during the 1980s, and it was denoted through the actions of the Federal government in the United States. The American government launched the School Leadership Academies, which was the first step in providing the federal government to lead the education system. In perspective, the Federal attempt to promote the growth of school leadership derived its legitimacy from a growing conviction that there was a credible knowledge base underlying the development of principal leadership supported by trustworthy research on instructional leadership in effective schools. Later, it provided a scheme for the Academies' leadership development curricula (Hallinger, 2010).

There are many theories and frameworks that can be used to describe instructional leadership. However, the early instructional leadership models and theories are referred to as those of Hallinger and Murphy Models (1985), Murphy model (1990) and Weber model (1996).

According to the conceptual paradigm of Hallinger and Murpys' (1985) model, effective instructional leadership should focus on three main areas, including 1) defining the school mission (drawing on school goals and explaining school goals), 2) managing curricula (supervising and evaluating teaching, coordinating curriculum, monitoring student progress, and assure instructional time), and 3) fostering a supportive learning environment (maintaining learning support, providing incentives for teachers, enforcing academic standards, promote professional development and provide incentives for learning).

As Murphy (1990) synthesized research findings from the literature on effective schools, school reform, staff development, and organizational change, he produced a comprehensive and systematic overview of instructional leadership. He then proposed four dimensions of instructional leadership in his model as follows:

1) **Developing missions and goals:** Principals must foster a sense of shared purpose by uniting the school's efforts under a common goal. This dimension elaborates on the principal's work on framing and communicating school goals. Framing school goals refers to setting goals that place a focus on student achievement, combining information on past and present student performance, and adding staff duties for accomplishing those goals, while communicating school goals refers to presenting clear school goals that direct the school's operations to students, parents, and teachers in both formal and informal setting.

2) **Managing the instructional programs:** It refers to the management style of the principals. Instructional principal tasks focus on promoting high-quality instruction, conducting teacher meetings and evaluations, visiting classrooms, and offering detailed suggestions and feedback on the teaching and learning process. The principals assign and maintain teaching time through school regulations and procedures. The principals must also collaborate with teachers to synchronize the curriculum by coordinating school goals and objectives with state standards, exams, and district curriculum. Additionally, principals routinely evaluate the development of the students.

3) **Promoting academic learning climate:** It is the actions of principals that affect the norms, perspectives, and attitudes of teachers, students, and parents in a school. This dimension directly related to how students are taught and learn in classrooms.

4) **Developing a supportive work environment:** It describes how principals create school frameworks and procedures to support in teaching and learning process. The instructional principals cultivate a secure and orderly learning environment, offer chances for significant student involvement, foster school personnel cohesiveness and collaboration, warrant outside funding for school objectives, and establish relationships between the community and the school.

Weber (1996) addressed the necessity of instructional leadership in organizing the school. Weber's theory is especially relevant in shared leadership and site-based management-driven educational environments. Sharing leadership and empowering informal leaders are features of Weber's (1996) instructional leadership model. Weber emphasized the requirement for an instructional leader even when the leader is absent. The following five crucial dimensions of instructional leadership were established by Weber (1996):

1) Defining a school's mission. It refers to a dynamic collaboration process and introspective thought to develop a straightforward and truthful mission. The school mission statement is established to inspire a shared vision among teachers, students, and parents. The instructional principals provide stakeholders chances to discuss the school's values and standards. They collaborate to develop the missions for the school.

2) Managing curriculum and instruction. It is the way that curriculum and instruction are managed in line with the school mission. The instructional principals provide teachers with the resources they need to assist students with the chance to achieve through their repertoire of instructional strategies and classroom management. The principals support teachers utilizing the most recent research on instructional best practices and tactics to enhance student learning.

3) Promoting a positive learning climate: It means the collection of beliefs, values, and attitudes of principals, teachers, and students toward learning, which influences student learning. Principals foster a healthy learning climate by sharing instructional goals, establishing high-performance standards, creating a positive learning atmosphere with respected behaviors, and striving to strengthen teacher commitment to school development.

4) Observing and improving instruction: The first step is for the principals to build relationships of respect and trust with the teachers. According to Weber (1996), observations present chances for professional connections. Both of the observer and the person being observed can benefit from these interactions, including professional development. In other words, the principals can help teachers to solve any instructional problems on time.

5) Assessing the instructional program. It has been viewed that developing instructional programs is essential responsibility of principals. The instructional principals take the initiative and actively participate in the creation, administration, and analysis of assessments that measure the efficiency of the curriculum.

Alig-Mielcarek (2003) merged the three dominant models of principal instructional leadership from the previous scholar, including Hallinger and Murphy (1985), Murphy (1990), and Weber (1996). In a pilot study using an instructional leadership instrument, the hypothesized framework of Alig-Mielcarek's (2003) instructional leadership model has been empirically tested. There was three dimension described as follows:

1) Defining and communicating shared goals: It implies that the principals collaborate with the teachers to specify, convey, and implement the school's data-driven goals. These goals bring the school personnel together with a single purpose to complete.

2) Monitors and provides feedback on teaching and learning process: It is the actions of principals taken by an instructional leader concerning the academic curriculum. The tasks include being engaged throughout the school, interacting with students and teachers, praising and offering feedback on academic success to teachers, students, and the community, and ensuring that the school's instructional time is uninterrupted.

3) Promoting school wide professional development: It discusses principal behaviors that support lifelong learning. The instructional principals offer professional development opportunities, encourage teachers to learn more about student performance through data analysis, and provide teachers with necessary resources.

In the literature review of Strong et al. (2008), principals use instructional leadership to achieve their academic goals. They raised five dimensions of principals' instructional leadership in their model as follows: 1) establishing and maintaining a school vision by setting up specific learning objectives and motivating everyone in the school and community to fulfill those goals, 2) sharing leadership by fostering and relying on the knowledge of teacher leaders, 3) directing a learning environment to offer personnel growth, 4) collecting data to use in instructional decision-making and 5)

monitoring and encouraging curriculum implementation and quality instructional practices by spending time in classrooms.

In 2002, McEwan offered an alternative viewpoint on leadership and proposed seven components of the effective instructional leadership. The seven components suggested by McEwan (2002) are as follows: 1) establishing clear instructional goals, 2) being there for your staff, 3) creating a school culture and conducive climate for learning, 4) communicating vision and mission, 5) setting the high expectations, 6) developing teacher leaders, and 7) maintaining positive attitudes toward students, staffs, and parents.

1.4 The components of instructional leadership

The significance of instructional leadership and its fundamental duties has received substantial academic support from numerous experts. In the literature, they found descriptions of instructional leaders as powerful, decisive characters who thrive to enhance school achievement (Ylimaki, 2014).

This study synthesized the four main models of principals' instructional leadership from Murphy (1990), Weber (1996), Alig-Mielcarek (2003) and Strong et al. (2008).

In his synthesis of research findings from the literature on effective schools, staff development, and organizational transformation, Murphy (1990) offered a systematic and thorough examination of instructional leadership which consists of four dimensions, including 1) defining missions and goals, 2) promoting quality instruction and monitoring student progress, 3) promoting an inclusive environment of learning and 4) developing a supportive work environment. The framework only considers school settings, limits principals' responsibilities, and prevents understanding of the many other roles undertaken in school administration (Hallinger, 2012). Weber (1996) included shared leadership and the empowering of informal leaders. According to Weber (1996), school principals must act as instructional leaders and work with teachers in school development processes. He proposed five key dimensions of instructional leadership such as: 1) defining the school mission, 2) managing curriculum and instruction, 3) promoting a positive learning climate and 4) observing and improving instruction. This paradigm stated that instructional leaders are crucial in

initiating and contributing to planning, designing, administering, and effectively analyzing a curriculum. By constantly revising and improving the curriculum, teachers can satisfy the needs of their students as a result of ongoing program evaluation (Hallinger and Heck, 2010). For this reason, Weber's model generally incorporates studies on shared leadership and the empowerment of unofficial leaders to establish a school that prioritizes student accomplishment.

It has been viewed that Murphy's (1990) and Weber's (1996) models of instructional leadership stressed the significance of instructional principals who respond by outlining and explaining goals, focusing on and offering feedback on the teaching and learning process, and encouraging and highlighting the significant of professional development.

In Alig-Mielcarek's (2003) study, she adapted the three models of instructional leadership from three predominant studies, including Hallinger and Murphy (1985), Murphy (1990) and Weber (1996). Alig-Mielcarek (2003) developed the framework of instructional leadership using three dimensions, then empirically tested them. Her study, *A Model of school success: instructional leadership, academic press, and student achievement*, was to create a path model that would explain the relationships between significant school factors and student accomplishment. The framework included three components such as 1) defining and communicating shared goals, 2) monitoring and providing feedback on the teaching and learning process and 3) promoting school-wide professional development.

Stronge et al. (2008) claimed that good instructional principals guarantee a successful school outcome. Principals today manage instructional leadership relationships more dynamically to meet the challenges of the 21st century. Principals often attribute this to leadership in instruction. They compiled five components of instructional leadership of principals who must use to achieve educational objectives by drawing on a thorough review of the literature. Those existing components include 1) building and sustaining a school vision, 2) monitoring curriculum and instruction, 3) leading a learning community, 4) using data to make instructional decisions and 5) sharing leadership.

From the literature reviewed, the researcher grouped each component based on similar meaning and synthesized the new components of principals' instructional

leadership from the predominate models of Murphy (1990), Weber (1996), Alig-Mielcarek (2003) and Stronge et al. (2008) and summarized in the Table1 as bellow:

Table 1: The synthesis of principals’ instructional leadership components.

Murphy (1990)	Weber (1996)	Alig-Mielcarek (2003)	Stronge et al. (2008)	This Study
<p>Defining mission and goal</p> <p>Framing school goals</p> <p>Communicating school goals</p>	<p>Defining the mission</p> <p>Develop school common vision and goals collaboratively with school personnel</p>	<p>Defining and communicating school goals</p> <p>Promote schools academic goals to students</p> <p>Develop school goals with high standard and expectation with school goals</p> <p>Communicate school goals personnel</p> <p>Develop a well-defined school goals</p> <p>Set high achievable standards for students</p> <p>Develops data-driven academic school goals with teachers</p>	<p>Building and sustaining a school vision</p> <p>Develop a school vision that sets clear learning goals and gaining community support for those goals.</p>	<p>Developing and sustaining school vision</p> <p>Develop well-defined school vision collaboratively with school personnel</p> <p>Communicate School goals precisely to all stakeholders</p>

Table 1: (Cont.)

Murphy (1990)	Weber (1996)	Alig-Mielcarek (2003)	Stronge et al. (2008)	This Study
-	<p>Managing curriculum and instruction Monitors classroom practice alignment with the school’s mission. Provide resources and support in the use of instructional best practice and model. Providing support in the use of data to drive instruction.</p>	<p>- Ensure the curricular materials are consistent with school goals</p>	<p>Monitoring curriculum and instruction Check on and promote the implementation of curricula and quality teaching methods by spending time in classes.</p>	<p>Managing curriculum and instruction Check on and promote the implementation of curricula and support quality teaching through evaluating classroom practice and provide resources needed</p>
	<p>Assessing the instructional program Helps to plan, create, conduct, and analyze assessments to ensure the effectiveness of curriculum.</p>			

Table 1: (Cont.)

Murphy (1990)	Weber (1996)	Alig-Mielcarek (2003)	Stronge et al. (2008)	This Study
<p>Managing the educational product function Promote quality instruction Supervise and evaluate instruction Allocate and protect the instructional time Coordinate the curriculum Monitor student progress</p>	<p>Observing and improving instruction Observe and improve instruction through classroom observation and professional development opportunities</p>	<p>Monitor and provide feedback on the teaching and learning process Provide private feedback to students or teachers Work with students on academic task Provide data on schools' progress to community Ensure instructional time Appreciate students and teachers performance Be visible in school Evaluate teacher to improve instructional practice Check on assessment data with teachers Monitor classroom practice in line with district curriculum Observe teachers for professional development instead of evaluation & Visit classroom</p>	<p>-</p>	<p>Supervising teaching and learning process Provide supervision for teachers Provide private feedback to students or teachers Allocate and protect instructional time Monitoring student progress</p>

Table 1: (Cont.)

Murphy (1990)	Weber (1996)	Alig-Mielcarek (2003)	Stronge et al. (2008)	This Study
<p>Promoting an academic learning climate Establish positive expectations and standards Maintain high visibility Provide incentives for teachers and students Promote professional development</p>	<p>Promoting a positive learning climate Foster a supportive learning climate by outlining expectations, conveying goals, and creating a peaceful learning environment</p>	<p>Promote school-wide professional development Provide for in-house professional development opportunities around instructional best practices Encourage teachers to attend professional development activities Furnish useful professional materials and resources to teachers Schedule time on in-service days for collaboration among teachers Schedule the school day for common planning time Plan professional development around teachers needs</p>	-	<p>Promoting school learning environment -</p>

Table 1: (Cont.)

Murphy (1990)	Weber (1996)	Alig-Mielcarek (2003)	Stronge et al. (2008)	This Study
<p>Promoting an academic learning climate</p> <p>-</p>	<p>Promoting a positive learning climate</p> <p>-</p>	<p>Promote school-wide professional development</p> <p>Support individualized professional development</p> <p>Plan professional development in-services</p>	<p>-</p>	<p>Promoting school learning environment</p> <p>Develop school positive expectations and standards</p> <p>Promote an inspired and safety learning environment</p> <p>Provide professional development activities for students/teachers</p> <p>Provide incentive and resources needed for teachers</p> <p>Promote PLC</p>
<p>Developing a supportive work environment</p> <p>Creating a safe and orderly learning environment</p> <p>Providing opportunities for meaningful student involvement</p> <p>Develop staff collaboration and cohesion</p> <p>Secure outside resources</p> <p>And support</p>			<p>Leading a learning community</p> <p>Steer a collaborative community of professional learners that provides meaningful staff development</p>	

Table 1: (Cont.)

Murphy (1990)	Weber (1996)	Alig-Mielcarek (2003)	Stronge et al. (2008)	This Study
-	-	<p>-</p> <p>Use data on student achievement to lead instructional program</p> <p>Utilize school goals for decision-making</p> <p>Encourage teachers use data analysis for students' academic progress</p>	<p>Using data to make instructional decisions</p> <p>Use evidence-based data in instructional decision-making</p>	<p>Driving data to make instructional decisions</p> <p>Using evidence-based data in instructional decision-making</p>

Table 1: (Cont.)

Murphy (1990)	Weber (1996)	Alig-Mielcarek (2003)	Stronge et al. (2008)	This Study
-	-	-	Sharing leadership Distribute leadership roles by strengthening the expertise of teacher leaders to enhance school performance	Sharing leadership Distribute leadership roles by strengthening the expertise of teacher leaders to enhance school performance

Table 1 shows that there were six components of principals' instructional leadership emerged and used as a framework in this study. Each component was defined by adapting and considering items from Murphy (1990), Weber (1996), Alig-Mielcarek (2003) and Strong et al. (2008) and the context of New Generation Schools in Cambodia. The six components are:

- 1) Developing and sustaining school vision
- 2) Managing curriculum and instruction
- 3) Supervising teaching and learning process
- 4) Promoting school learning environment
- 5) Driving data to make instructional decision
- 6) Sharing leadership

1) Developing and sustaining school vision

A crucial component of instructional leadership is to define and communicate a school mission or goal. A vision statement for literacy and numeracy integrates the school efforts and assists teachers and students in creating a single language and set of shared values. It should put its fundamental principles and ideas at the center of instruction and learning and serve as a platform for a comprehensive review of professional practice.

Murphy (1990) defined the mission and goal as containing two sub-components: framing and communicating the school goals. Framing the school goals entails the role of the principal in deciding where the school personnel will concentrate their efforts and resources throughout a given academic year while communicating the school goals involves how the principal conveys the significant goals to school personnel, parents, and students. The principal must ensure that everyone in the school community aware the school's goals (Townsend, 2019). Whereas, Weber (1996) claimed that schools are loosely connected organizations, and it can be difficult for an instructional leader to get the members to cooperate toward common goals when they have a high degree of relative autonomy in almost all crucial parts of their work. The system, then, is held together by shared goal. The message a principal chooses to convey may be a synthesis of the factors outlined in the preceding section, the long-

term requirements of the community, his or her vision of what a school can be, and practical, attainable targets in the classroom. A principal may need to evaluate the values and qualities present in the teachers, students, and staff to choose the theme. Alig-Mielcarek (2003) implied that the principal collaborates with the school personnel to specify, convey, and implement the school's common data-driven goals. She also added that principals make decisions, coordinate instructional practices, procure curriculum materials, and set progress targets which rely on the goals. These goals unite the team under a single aim.

In the study of Clark (1980) and Edmonds (1979) stated that the school goals should include all related personnel responsibilities for accomplishing the process as well as information on previous and current student achievement. It appears crucial that the feedbacks of teachers and parents are taken into account, while creating the school goals. Performance mission should be stated in quantifiable ways. Principals must ensure that school members understand the significance of school goals by regularly discussing and reviewing those goals with them during the academic year, especially in light of choices on curriculum, instruction, and funding. The school goals can be communicated through formal means (e.g. goal statements, staff bulletins, articles in the newsletter, curricular and staff meetings, parent-teacher conferences, the school handbook, and assemblies) as well as informal means such as conversations with personnel (Brookover et al., 1982; Brookover and Lezotte, 1979).

Here in this study, developing and sustaining school vision refers to the principal's responsibility in defining the mission, including formulating data-driven shared goals with the school personnel for the entire school development, by choosing the areas on which school personnel will concentrate their efforts and resources during a given school year, and persistently communicating those goals to all members of the school community.

2) Managing curriculum and instruction

Effective teaching and learning are fundamental in the curriculum management process. Curriculum objectives closely correlate with the subject matter covered in class and achievement tests. The curriculum across grade levels seems to have a considerable quantity of continuity. Further communication between teachers

within and across grade levels regarding curriculum and instruction is frequently supported of the feature of curricular coordination (Freeman et al., 1983; Levine, 1982; Levine and Stark, 1982).

Weber (1996) most obviously said that a school mission is being carried out by curriculum and instruction. Like setting goals, the principal finds it hard to complete may involve identifying the instructional possibilities accessible to teachers and then choosing them with teachers, and those that best match the limitations imposed by the school environment. The instructional principal must be well-informed about teaching methods and current education trends. Whereas, Hallinger and Murphy (1985) mentioned that class supervising and evaluating, planning the curriculum, and keeping track of students' progress are all parts of managing the instructional program. The leader must be highly invested in the school mission to fulfill the duties of curricular development.

In this study, managing curriculum and instruction refers to the way that principals interact among teachers within and across grade levels to coordinate curriculum and instruction in line with the school mission.

3) Supervising teaching and learning process

A crucial responsibility of the principal is to ensure that school goals are reflected in classroom activities. This includes aligning the objectives of the classroom with those of the school, supporting teachers' instruction, and observing classroom instruction through classroom visiting. Feedback is needed to be provided to teachers in supervising and evaluating purposes regarding teachers using a particular teaching technique. Supervising contributes to the development of a more supporting, caring, and positive working environment as it fosters frequent communication and problem-solving, as well as improving teamwork (Stallings, 1980).

Murphy's (1990) model mentioned that the activities of promoting quality of instruction and monitoring student progress referred to principals supporting high-quality teaching by organizing teacher conferences, visiting classrooms, providing in-depth feedback and suggestions on the teaching and learning process, and supporting teachers in a way that improves student learning. With the help of school policies and procedures, the principal protects teaching hours in line with the state standards and

curriculum. Besides creating goals and evaluating instruction using assessment data, the principal also collaborates with teachers to coordinate the curriculum while frequently monitoring students' progress.

Weber (1996) mentioned that to observe and enhance the teaching process, first; the principal needs to build relationships of respect and trust with teachers and staff. He suggested that observations present chances for potential connections. These exchanges can be advantageous for the professional development of the observer and the person who is being observed. In other words, a reciprocal relationship between principals and teachers offers professional development chances to both parties. Whereas, Alig-Mielcarek (2003) mentioned that it is outlined as instructional activities of the principals around the academic program, like being visible throughout the entire school, communicating with teachers and students, and giving them feedback on academic achievement while aiming to ensure that the school's instructional hour is uninterrupted.

In this study, supervising the teaching and learning process highlights the actions that the instructional principal engages in the academic program, including being accessible throughout the school, connecting with students and teachers, recognizing and giving feedback on the achievements of teachers, students, and the community, also assuring that the school's instructional time is not disrupted.

4) Promoting school learning environment

School learning climate refers to the norms and attitudes of teachers and students that impact teaching and learning. It comprises indirect, though significant, activities using the school's policies and practices (Murphy et al., 1982). The establishment of a reward system that rewards academic success and productive effort, the use of explicit, clear standards that represent what the school expects of students, the thoughtful planning of instructional time, and the choice and implementation of top-notch staff development initiatives are all ways that principals can have an impact on student and teacher attitudes (Hallinger and Murphy, 1985). The pleasant learning environment frequently assists students with a good feeling to learn.

Murphy (1990) referred to promoting a school environment as an environment conducive to learning and teaching and is responded to by principals. The

principal who embodies the quality of the learning environment cultivates a secure and orderly learning space, offers chances for significant student involvement, fosters teacher cohesiveness and collaboration, secures outside funding for school objectives, and establishes relationships between the school and the community.

Slimily, in the study by Weber (1996), he mentioned that the most significant element that appears has an impact on students' learning is the set of assumptions, ideals, and attitudes that teachers and students hold about learning. Principals help foster a healthy learning climate by conveying instructional goals, establishing high-performance standards, creating a calm learning atmosphere with clear discipline expectations, and working to build teacher commitment to school development.

Meanwhile, Alig-Mielcarek (2003) specified this component as the behaviors consistent with lifelong learning. The instructional principal requires teachers to increase their knowledge by offering qualified development opportunities that fit educational objectives and providing teachers with materials and books written by professionals.

In this study, promoting a school learning environment refers to the creation of a safe, inspiring, and conducive learning atmosphere where teachers and students enjoy teaching and learning activities while keep maintaining a positive learning attitude in school.

5) Driving data to make instructional decision

White (2011) mentioned that principals must effectively use data to respond to requirements of student accomplishment and school development. Furthermore, it is impossible to track and assess the success of school activities without allocating the necessary data. Effective principals adeptly access data to estimate how well a school achieves its goals and make decisions based on the exact data. Ultimately, the data is used in an ongoing process of contemplation, analysis, and improvement of the school (Sun et al., 2016). School principals frequently used test results, graduation rates, and other academic indicators to assess how well their schools performed to meet the external accountability requirements (Mandinach, 2012). Similarly, Strong et al. (2008) mentioned in their study that in addition to the capacity for the effectiveness of data

collecting and analyzing, principals must maintain the fundamental skills to use school data to define school goals, develop the professional growth of teachers, and rebuild the school infrastructure. Furthermore, the principal must encourage teachers to reevaluate preconceived notions about their duties. They added that effective principals accept no justifications for failure to improve student learning because proper data utilization helps maintain a constant emphasis on improving teaching and learning.

In this study, driving data to make instructional decision refers to the principal using evidence-based data in instructional decision-making that align with school goals for student achievement, teacher development, and school improvement.

6) *Sharing leadership*

Sharing leadership is often regarded as a characteristic of groups that indicates intentional patterns of trust and mutual influence among the members (Louis, Dretzke and Wahlstrom, 2010). Sharing leadership might have a significant impact by decreasing teacher isolation and strengthening dedication to the common good (Pounder, 1999). Strong et al. (2008) mentioned that no leader can complete all the necessary tasks by oneself. A variety of leadership activities in school are now required due to the increasingly demanding and complex circumstances (Townsend, 2019). A focus on shared practices and goals is impacted by experiencing and feedback in the context of significant professional dialogues and may promote innovation (Chrispeels, Castillo and Brown, 2000; Harris, 2008).

In this study, the term sharing leadership refers to principals encouraging teachers to contribute and participate in school-wide decisions.

1.5 Factors for developing instructional leadership

The school principal has many duties to fulfill the demands of the community, parents, staff, and students, thus; the aim of instructional leadership is for the principal to collaborate closely with teachers to raise student accomplishment. Any principal who wishes to consider their instructional leadership practice might utilize the following traits as a great starting point. The fact that the instructional leadership approach has frequently been perceived as top-down and directive is interesting to notice. This results obviously from the effective school's literature primary focus on "turn-around schools," which required immediate reform. Successful principals in these settings

seemed to be very directive leaders who prioritized change in teaching and learning (Hallinger and Murphy, 1985, 1986).

- 1) Establishing defined goals that are centered on student learning and fostering a common sense of purpose in the institution.
- 2) Encouraging schools' ongoing progress along with cyclical school development planning that involves a variety of stakeholders.
- 3) Creating an environment of high standards and a culture in the classroom which values innovation and the enhancement of teaching and learning.
- 4) Arranging the curriculum and keeping track of students' academic progress.
- 5) Adjusting the school's incentive system to ensure the reflection of the schools' objective.
- 6) Coordinating and overseeing a variety of initiatives for staff development on an ongoing basis.
- 7) Being a visible presence in school and displaying the culture's desirable ideals.

Osman and Mukuna (2013) stated that curriculum and teaching methods in a school are centered on the principal. The internal structure of the school, including the organizational structure, environment, and culture of the school is more directly impacted by the principal's instructional leadership style than the external structure. The principal significantly influences students' outcomes when internal structures are designed, developed, and interacted within the school. The relationships between principals, their views, and the school's environment are necessary for effective instructional leadership. Furthermore, principals must consider the community's expectations, values, and prior experiences to display their leadership and make decisions in school development.

2. Teachers' 21st Century Teaching Competencies

Before defining the meaning of teachers' 21st century teaching competencies, the researcher first address the term Competency and 21st Century as follows:

Competency: is a fundamental aspect of how people act or think in various circumstances and changes over time. Additionally, competence is something one practice, and the effects are visible. Alternatively, competence refers to the ability to apply or use one's knowledge, skills, abilities, habits, and personal traits to carry out a challenging task in specific roles and positions (Sulaiman and Ismail, 2020; Tapani and Salonen, 2019; Weinert, 1999).

From an educational standpoint, competencies are defined as a link of information acquired through experience and teachers' awareness of effective teaching methods. The creation and use of the competency model is an investment and development of human resources that will lead to a more efficient and effective workforce (Sulaiman and Ismail, 2020).

The 21st century: is known for its quick technical development. The widespread adoption of digital technologies has dramatically altered our way of life and how we connect with others. According to Castells (2010), the 21st century is a time of intense transformation and distinct from any other, as vital business capabilities now place a larger focus on knowledge, mobility, and collaboration (Chu et al., 2017; Dede, 2009). Hence, educators remain a crucial role in developing human resources with 21st century skills.

Figure 2: Required Skills for the 21st Century

Required Skills for the 21st Century
1. Critical thinking, problem solving, reasoning, analysis, interpretation, synthesizing information
2. Research skills, interrogative questioning
3. Self-direction, planning, self-discipline, adaptability, initiative
4. Oral and written communication, public speaking and presenting, listening
5. Leadership, teamwork, collaboration, cooperation
6. Information and communication technology (ITC) literacy,
7. Global awareness, multicultural literacy, humanitarianism
8. Scientific literacy and reasoning, the scientific method
9. Health and wellness literacy, including nutrition, diet, exercise, and public health and safety

Source: <http://edglossary.org/21st-century-skills/>

2.1 The definition of teachers' 21st century teaching competencies

Arrington (2014) mentioned that teachers and their instructional design are the factors determining student learning. The 21st century teachers are expected to utilize the 21st century classroom to ensure the student's learning effectiveness. As so, teachers are currently required to improve teaching methods to gain students' hands-on experiences, life skills, and innovation. Also, it was mentioned that teachers in this era must retain 21st century competencies and share them with students accordingly. Teachers must combine academic knowledge with 21st century skills to prepare students as 21st century workforces. Thus, teachers formally need to remain 21st century teaching competencies.

Meanwhile, Sontag (2009) stated that the recent learning theories have been recognized for causing the majority of the nation's educational system to shift from focusing on the instructor to student. Thus, the role of teacher now is different from that in the past. The 21st century teacher need to employ up-to-date teaching competencies in order to promote 21st century learning.

Nessipbayeva (2012) mentioned that the knowledge, skills, and attitudes required to succeed in the workforce of the 21st century are referred to as 21st century competencies. The teachers of the 21st century must be able to offer students learning opportunities supported by technology and understand how technology can facilitate student learning.

Tigelaar, Dolmans, Wolfhagen and Van (2004) defined teaching competencies as an integrated combination of personal traits, information, abilities, and attitudes required for successful performance in a variety of teaching scenarios. According to this definition, teaching competencies are interconnected and ought to be seen as a full suite of tools a teacher can use.

Mandal (2018) indicated that the 21st century teaching competencies are generated to benefit all students. It refers to a crucial turning point for the effective adoption of 21st century skills practices of instructors to interpret techniques and integrate knowledge and skills through reflective practice. Students are required to remain knowledge, skills, and attitudes to succeed in the workforce of the 21st century.

Tapani and Salonen (2019) defined 21st century teaching competencies as a factor that support student effective learning, including the pedagogical knowledge of teachers and teachers' professional expertise of a topic, concept, or phenomenon. Teachers must be able to transfer their lessons in a way that students can understand easily.

In this study, teachers' 21st century teaching competencies refers to a collection of abilities, knowledge, behavior, and traits that enable the successful performance of teacher to deal with the current educational situation.

2.2 The importance of teachers' 21st century teaching competencies

Teachers and school principals are currently placing more and more emphasis on instruction based on 21st century skills in order to tackle the most recent economic difficulties. This may results from, the collaboration nowadays is becoming more complex and requires a broader range of skills. Personnel in the 21st century increasingly complete tasks through mediated contacts with peers halfway around the world whom they may never have met in person, in addition to interacting face-to-face with peers across a conference table (Dede, 2009). Likewise, teachers today not only

ensure student effective learning but also 21st century skills and a holistic personality (Sulaiman and Ismail, 2020). Therefore, the improvement of teacher instructional quality is being attributed to the development of the 21st century competencies which are commonly believed to cover a variety of skills, including civic duty, creativity, metacognition, communication, digital and technological literacy, critical thinking, problem-solving, and creativity that will change all facets of human life (Kim et al., 2019).

According to scholars, teachers, as the main developer in the education system, use the 21st century instructional methods to help students to explore new knowledge by themselves and enable them to come up with creative thinking. Moreover, teachers preparing their students with 21st century abilities will allow them to work in teams, make decisions, plan effectively, manage their time, listen to one another, and select the appropriate communication method when necessary. Thus, 21st century expertise is needed to determine the future educational outcomes (Darling-Hammond, 2006; Newton and Newton, 2014; Jan, 2017; Saavedra and Opfer, 2012).

2.3 The concepts and theories of teachers' 21st century teaching competencies

In order to promote the effectiveness of 21st century teaching competencies in the education system, educators need to recognize the criteria that help develop teachers' expertise in those areas. The below discussions will emphasize more closely the concepts of teaching and learning theories and the concepts of teaching competencies.

In the late 1960s, the concept of teaching competencies has been viewed as the collection of discrete and theory-free skill sets spread throughout many nations. The concept was to define teachers as competent teachers based on visible development in their instructional performance (Pantić and Wubbels, 2010).

Teaching competencies proposed by the National Council for Teacher Education (NCTE) in the 21st century consisted of: (Hasan, 2016)

- 1) Contextual competencies: It focuses on the ability of teachers to apply materials in various pertinent contexts addressing on socioeconomic, political, and cultural in national and international level.

2) Conceptual competencies: Teachers must be comprehensive about the theories concepts, laws, and principles of the subject being taught in order to be a competent teacher.

3) Content competencies: Teachers should be generally acknowledge the nature, quantum, and psychological connections of the content.

4) Transactional competencies: It is concerned with how the different audio-visual tools might be used to facilitate learning. Teachers need to be adept in a variety of teaching techniques in order to apply the curriculum.

5) Extra-activities competencies: It highlights the activities, including recognizing different days, celebrating events, participating in cultural activities; in addition to, the instruction that takes place in the classroom.

6) Constructing materials competencies: It entails creating the useful instructional materials required for classroom instruction. A competent teacher should be able to create a variety of teaching tools in addition to designing curriculum.

7) Evaluation competencies: Teachers must realize about the various methods of evaluation, as well as how to create and provide reliable assessments.

8) Management competencies: It includes the managerial abilities required in the classroom as well as in school. Therefore, teachers must possess good managerial skills in order to oversee and maintain classroom discipline.

9) Building parent-teachers relationship competencies: It emphasizes the teachers' capacity for productive communication with students' families. Therefore, teachers should be able to amuse students' parents of all kinds in a well manner.

10) Communication with community competencies: Teachers need to enhance the relationships with the local community and with organizations working in the field of education on a global scale.

Meanwhile, the teaching competencies could be better described as both general and specific teaching competencies as follows (Haskew, 1956, Wilson, 1973 as cited in Hasan, 2016):

1) General teaching competencies: It emphasizes the basis of scientific teaching methodologies while taking ethical and professional growth into account. The primary core teaching competencies are personal value, professional development,

understanding the student, determining the learning and teaching process, evaluating learning and development, building relationships between school and community, and comprehending curriculum and content.

2) Specific teaching competencies: It refers to both subjects matter and education background. However, the more common definition is that teaching competencies refer to the acquisition and demonstration of the composite teaching skills necessary for classroom instruction, such as introducing a lesson, questioning, communication, interpreting skills, integrating the lesson with life skills, reinforcement skills, understanding students' characteristic, classroom management, and evaluation skills.

Singh et al. (2020) and Maj (2022) mentioned that the 21st century promotes the value of deep meaning over superficial meaning. A teaching and learning program that moves from surface learning to deep learning is supported by teachers. The teaching and learning strategies that are promoted to foster quality in teaching and learning depend on learning theories.

Learning Theories: Learning theories are crucial since they function as the foundation for developing instructional theories. There are numerous contrasting theories and methods for learning. The theories presented in this section offer teachers choices in their 21st century teaching competencies. Alongside traditional ones, the new powerful conventional models and theories are developed, including cognitivism, constructivism, reflectivism, and connectivism, which are pertinent in this study since they contain the 21st century teaching and learning principles.

1) Cognitivism:

The foundation of cognitivism is the way of thinking underlies a behavior. According to this theory, students think about the information they have learned rather than just reacting to external stimuli. Cognitive information processing is employed when students actively seek ways to interpret and process new information and relate it to what is already known and stored in their memory. This theory is applied in the classroom once the student participates in tasks such as discussion and problem-solving. Students are encouraged by their teacher to ask questions to obtain new ideas, analyze them, and give conclusions. Critical thinking

is fostered among the students. The learning process is typically completed through active learning, which focuses on the students in particular (Singh et al., 2020).

2) *Constructivism:*

The constructivism theory of learning encompasses a variety of viewpoints. Each of the viewpoints is based on the idea that students actively create knowledge from their experiences. As a result, information cannot simply be transferred from one learner to another; rather, it must be created by each learner on their own. The constructivist learning theory places a strong emphasis on these six pillars as follows: (1) Learning is an adaptive process, (2) Learning takes place in the environment in which it unfolds, (3) The learner constructs knowledge by themselves, (4) Learning is influenced by previous knowledge and experience, (5) Change is being resisted and (6) Learning is facilitated by social interaction (McLeod, 2003).

3) *Reflectivism:*

The two ideologies, reflectivism, and constructivism, are similar in many ways. It goes a little further than constructivism and is embedded in it. Reflection is the process of recalling prior experience while taking into account and evaluating all available information to conclude. Reflection entails using critical thinking skills to analyze previous or present learning experiences. It enquires questions about what was successful or unsuccessful and what inspired students, and other factors that have an impact on the teaching and learning process (Singh et al., 2020).

4) *Connectivism:*

Connectivism as a learning theory was developed primarily to contest the bounds and limitations of behaviorism, cognitivism, and constructivism theories. This theory was developed on the premise that knowledge is more likely to exist in the real world than in students' heads. Learning as a process takes place within a nebulous environment of constantly changing fundamental elements independent of the individual. Additionally, connectivism uses a system of nodes and links to facilitate learning to know how to find the information or knowledge when needed (Masethe et al., 2017). The connectivism's guiding concepts are emphasized as follows: (1) Diversity of thought is essential to learning and knowledge, (2) Connecting specialized nodes or knowledge sources is the process of learning, (3) There may be learning in

non-human objects, (4) Knowledge beyond what is presently understood is more important, (5) Promoting ongoing learning and connections must be fostered and preserved, (6) An essential element is the capacity to see connections between different areas, ideas, and concepts, (7) All connectivist learning activities strive to provide students with accurate and recent information and (8) Making decisions is a process of learning (Goldie, 2016).

The 21st century teaching competencies are recently seen as rising in interest among educators and researchers. The study about the 21st century competencies is needed in particular to prepare students with 21st century skills (Drake and Reid, 2020).

Nessipbayeva (2012) characterized the 21st century teaching competencies as the knowledge, abilities, and attitudes required to compete in the workforce of the 21st century. The teachers of the 21st century must be able to offer students learning opportunities supported by technology and understand how technology can facilitate student learning. His study aimed to investigate the competencies of modern teachers. He adapted five components of the 21st century teaching competencies described below:

- 1) Teachers obtain leadership roles. Teachers who exhibit leadership skills enhance student learning outcomes, develop relationships with the community, promote diversity, and foster a climate of continual growth for themselves, their coworkers, and the students. Teachers exercise their leadership role by leading the classroom to ensure students get effective instruction and positive progress. Besides that, teachers are expected to collaborate in school affairs, engage in professional training or activities, as well as to be able to express ideas in school improvement plans.

- 2) Teachers create a friendly learning environment. The teachers in the 21st century focus on creating a positive learning environment where the students are warmly-welcomed, nurtured, and educated in an inclusive, learning-friendly environment. The purpose of creating a positive learning environment is also to inspire students to learn, to adhere to the rules, and to ensure students are safe in the learning classroom. Teachers must acknowledge building a positive learning environment where each student has a loving, caring, and supportive relationship with teachers. Teachers must also be aware of the student's diversity and build a good relationship with their parents and communities.

3) Teachers are knowledgeable about the subject they teach. Teachers must be proficient in creating and implementing lessons based on an effective course of study to improve student learning by incorporating 21st century skills content and effective literacy instruction across the curriculum and academic areas.

4) Teachers inspire their students in learning. Teachers inspire the students to learn by providing facilitation staff. In order to give helpful facilitation to students, teachers need to plan the instruction clearly before class, identify students' progress, allocate a diversity of resources, use technology in the teaching process, assign group works appropriately and effectively, and be accessible when students need help.

5) Teachers reflect their own practices. By doing so, it would help teachers to ensure the effectiveness of their academic performance. They are more likely to provide their students with a constantly improving learning experience if they regularly evaluate their instructional practice. Teachers can reflect on their practices by evaluating students' progress, upgrading their professional growth, and applying new effective teaching methods.

Similarly, Mandal (2018) proposed five components of 21st century teaching competencies in his study. These five components of 21st century competencies will be described in detail as bellow:

1) Teachers display leadership which is described as: (1) Teachers prepare effective classroom management though assessing student progress, using appropriate data to develop lesson plans, maintaining a positive behavior management strategies, and managing a safe and orderly classroom setting that supports student learning, (2) Teachers display leadership in the school by participating in a collaborative and inclusive proficient classroom instruction, recognizing the essential components of a school improvement plan, and demonstrating the ability to use the right data to pinpoint problem areas that should be discussed in a planning process, (3) Teachers influence the teaching and learning process through engaging with professional learning and development programs; and forming professional connection, (4) Teachers act as advocates for their schools by putting policies into practices and (5) Teachers exhibit great moral principles.

2) Teachers foster learning environment which is focused on: (1) Teachers promote tolerance in the school environment through using resources or lessons that challenge stereotypes, acknowledge the contributions of all cultures, and incorporate different points of view in instruction. Teachers also recognize the impact of students' diversity background and adapt their lesson plans accordingly, (2) Teachers regard each student as unique while fostering an atmosphere in the classroom where all students are treated fairly, (3) Teachers modify instruction through working with experts, utilizing resources, and utilizing research-validated methodologies to provide learning activities for students with special needs and (4) Teachers build relationship with students' parents and community for the benefit of students.

3) Teachers acknowledge clearly about the content of teaching. It refers to (1) Teachers design and implement lessons by combining a successful literacy instruction across the curriculum and across academic areas, (2) Teachers uphold a sufficient level of subject matter relevant to the teaching and encourage students to perform inquiry-based learning, (3) Teachers demonstrate their understanding about the integration of subject matter and discipline by linking the subject matter to disciplines and exhibiting their knowledge of the content on global scale and (4) Teachers design lessons relevant to 21st century skills and information.

4) Teachers simplify learning for their students which is elaborated as: (1) Teachers demonstrate their understanding of how learning occurs at the appropriate levels of intellectual, physical, social and emotional development for students. Teachers determine student developmental stages and plan lessons accordingly, (2) Teachers arrange appropriate instruction, and adapt multicultural education and individual learning requirements, (3) Teachers demonstrate their adaptability by using a wide range of techniques and resources appropriate for each student (4) Teachers improve their student learning by integrating technology into instruction, (5) Teachers support their students' critical thinking and problem solving development through the integration of particular strategies, (6) Teachers employ different techniques to effectively communicate with all students while continually encouraging and assisting students to express their ideas and thoughts clearly and (7) Teachers use a variety of formative and summative indicators to monitor and evaluate student progress.

5) Teachers mirror their work. This component can be described as follow: (1) Teachers facilitate student learning through analyzing data, (2) Teachers relate their professional development to their professional objectives by joining professional learning and development activities and (3) Teachers are able to work effectively in a complex, and dynamic setting through the implementation of a number of research-validated strategies.

Since teachers' role in education is precious in the 21st century, teachers need to retain high-quality performance. Thus, the Southeast Asia Teacher Competency Framework (SEA-TCF) was developed by the Teachers' Council of Thailand (TCT) in collaboration with the SEAMEO Secretariat (SEAMEOS) and the SEAMEO Regional Center for Educational Innovation and Technology (SEAMEO-INNOTECH) proposed four components of teachers' 21st century teaching competencies such as: (SEAMEO-INNOTECH et al., 2018):

1) Teachers know and understand what they teach: It refers to the capacity of teachers to gain a deeper and broader understanding of the teaching material, curriculum, policies, and trends in various educational contexts.

2) Teachers help students in learning: It emphasizes that teacher be able to assess student learning, provide feedback, and apply the most efficient teaching and learning methods.

3) Teachers engage with community: It indicates the ability of teachers to collaborate with parents, caregivers, and local community with a respectful manner and to involve them in educational process.

4) Teachers upgrade themselves every day: Teacher can identify identities of themselves and others, act morally, and keep learning new things.

Caena and Redecker (2019) also mentioned that teaching methods must evolve along with the 21st teaching competencies to provide students with the 21st century skill. They also mentioned encouraging practitioners and policymakers to reevaluate the role of technology in education as an enabler of innovation. They refer to educators' digital competence as a professional competence that helps design learning experiences in the digital age. The framework consists of six components as below:

1) Professional engagement: It outlines how instructors communicate and collaborate with co-workers, students, parents, and other stakeholders through using effective and acceptable technology. Additionally, it emphasizes the significance of instructors engaging with both individuals and groups to reflect on their teaching methods and digital teaching strategies.

2) Digital resources: It highlights the choices, development, modification and administration of digital educational resources. This involves the activities of upholding copyright rules while disseminating digital resources and protecting personal information in accordance with data protection laws.

3) Teaching and learning: It is the organizing, planning, and implementing the use of digital technologies in classroom instruction. It emphasizes the use of digital tools and resources to enable collaborative and self-managed learning processes.

4) Assessment: It means the practical application of digital technology for evaluating student performance and learning requirements to thoroughly give learners tailored and timely feedback.

5) Empowering student: It means the important of developing educational activities and experiences that meet students' needs and enable them to take an active role in their own learning. Teachers promote students' active participation in online learning, ensuring that all students have access to technology.

6) Facilitating students' digital competence: It mentioned that the digitally proficient teachers should support their students in becoming digitally competent so they can manage risks and use digital technology effectively. Teachers should be able to encourage ICT literacy and media literacy while incorporating activities supporting the development of digital learning and utilizing technology in the communication process.

Rwanda Education Board (2019) developed the National Teacher CPD Framework. The National Teacher CPD Framework was developed through a partnership between REB and UNESCO, supported by the OPEC Fund for International Development (OFID) program "Strengthening quality teaching and Learning for Education for All in Eastern Africa" initiated in 2015. It seeks to enhance capacities for managing, planning, and monitoring teacher education. The framework was written in

consultation with stakeholders at the central district sector and school levels, and it covered six standards as follow:

1) Teachers create and maintain a friendly learning environment. It focuses on the ability of teachers to ensure that the learning environment are clean and safe, respectful and uplifting attitude, while also ensure a proper learning time.

2) Teachers plan and assess learning by creating learning goal and outcome, evaluating students' participation and learning and using assessment data to improve teaching and learning.

3) Teachers value interaction to make learning possible by utilizing variety of communication tools, employing the appropriate level of teaching, and questioning students in the learning process.

4) Teachers organize activities and allocate resources in learning by setting up a variety of educational activities, providing a clear learning goals, and utilizing learning and teaching tools.

5) Teachers engage in professional development by consistently enhancing instruction and learning, utilizing CPD resources and opportunities, and reflecting instruction together with colleagues.

6) Teachers ensure students' academic progress both at school and at home through regularly communicating with students' parents, guaranteeing students enjoy learning, and offering resources and extracurricular activities.

2.4 The components of teachers' 21st century teaching competencies

Excellent instruction is produced by quality teachers. Providing the need for meaningful and high-quality instruction is crucial. Students in particular want to make sure that a high-quality education offers them the knowledge, abilities, and moral principles necessary for a successful career and lasting professionalism. However, McKnight et al. (2016) claimed that there is no universal recipe for effective teaching because it depends on the context.

Nessipbayeva (2012) examined the competencies of the modern teachers by conducting a study on the following subjects: students' skills, levels of teachers' professional growth, teacher pedagogical culture, pedagogical innovations, and 21st century teaching competencies. In her study, she suggested five the components of 21st

century teaching competencies such as: 1) obtaining a leadership role, 2) creating a friendly learning environment, 3) understanding the subject they teach, 4) inspiring students in learning and 5) evaluating their practices.

Similarly, Mandal (2018) mentioned that teachers of 21st century must understand how technology-supported learning opportunities and how technology might support student learning. This study raised five components of 21st century teaching competencies such as: 1) displaying leadership, 2) fostering a learning environment, 3) understanding clearly about the content of teaching, 4) simplifying learning for their students and 5) reflecting on their work.

SEAMEO-INNOTECH et al. (2018) provided a Southeast Asia Teachers Competence Framework developed by the eleven Ministries of Education in Southeast Asia (10 ASEAN countries plus Timor Leste) as a road map for teacher professional development in order to realize 21st century skills and practices in suitable and compatible regionally context in line with a global context. The 21st century teaching competencies framework is 1) understanding what to teach, 2) assisting students in learning, 3) engaging with the community and 4) upgrading themselves every day. SEAMEO-INNOTECH et al. (2018) stated that this SEA-TCF framework is regarded as a significant reference since it was created by and for Southeast Asian teachers in unique national and regional contexts.

In the article by Caena and Redecker (2019), aligning teacher competence frameworks to 21st century challenges: The Case for the European Digital Competence Framework for Educators, mentioned that to cope with the difficulties of the 21st century, teachers must upgrade their competence profiles. It is a must to modernize teaching methods and teacher competencies to equip students for the 21st century. To assess these demands, the European Framework for the Digital Competence of Educators provided a model for such endeavors. The framework connects the growth of the digital competence of teachers and students and can improve institutional capability, and it is flexible enough to be used in a variety of educational contexts and modified as new technological opportunities and obstacles emerge. The framework was organized in six areas as follows:

- 1) Professional engagement: It discusses about how teachers communicate and collaborate with coworkers, students, parents and other stakeholders by using technology

effectively and responsibly. Furthermore, it highlights the importance of teachers evaluating their professional practice and the efficacy and suitability of current digital teaching strategies.

2) Digital resources: It indicates the choices, development, alteration, and administration of digital instructional resources. It involves respecting copyright rules while updating and sharing digital resources and protecting personal information following data protection laws.

3) Teaching and learning: It focuses on the organizing, creating and planning the use of digital technologies in classroom instruction. It emphasizes the using digital tools and resources to foster collaborative and self-managed learning processes.

4) Assessment: It deals with the practical application of digital technology for evaluating students' learning requirements and performance thoroughly provide students with fast and relevant feedback.

5) Empowering learner: It refers to the necessity to develop the educational experiences and activities that meet the requirements of students and enable them to take an active role in education. Digital technologies give teachers the ability to differentiate instruction and personalize learning. Teachers promote students' active participation through online learning, ensuring all students have access to technology.

6) Facilitating students' digital competence: Teachers should support their students' development of digital literacy so they can manage risks and utilize technology responsibly and safely. Teachers should be able to promote information and media literacy while incorporating lessons that support the use of digital tools for collaboration, problem-solving, and creating digital material.

Rwanda Education Board (2019) proposed six components of teacher's competencies such as: 1) establishing and maintaining a friendly learning environment, 2) planning and assessing learning, 3) interacting to make learning possible, 4) facilitating activities and applying resources in learning, 5) engaging in professional development and 6) encouraging students' academic progress.

This study adapted the framework of teachers' 21st century teaching competencies from five main sources such as Nessipbayeva (2012), Mandal (2018),

SEAMEO-INNOTECH et al. (2018), Caena and Redecker (2019) and Rwanda Education Board (2019). The researcher then grouped each component of 21st century based on a similar meaning. The components of 21st century teaching competencies are shown in Table 2 as below:

Table 2: The synthesis of teachers' 21st century teaching competencies components.

Nessipbayeva (2012)	Mandal (2018)	SEAMEO- INNOTECH et al. (2018)	Caena and Redecker (2019)	Rwanda Education Board (2019)	This Study
<p>Teachers take a leadership role</p> <ul style="list-style-type: none"> Lead classroom Take role in school Lead the teaching profession Implement policies and activities Exhibit great moral principles 	<p>Teacher display leadership</p> <ul style="list-style-type: none"> Monitor effective classroom management Display leadership in school Lead teaching profession Promote school policy and practices Remain great moral principle 				<p>Exercising teacher leadership</p> <ul style="list-style-type: none"> Monitor classroom Participate in school activates Practice educational policies Be moral and professional

Table 2: (Cont.)

Nessipbayeva (2012)	Mandal (2018)	SEAMEO- INNOTECH et al. (2018)	Caena and Redecker (2019)	Rwanda Education Board (2019)	This Study
<p>Teachers are knowledgeable about the subject they teach Respect the subject matter relevant to their area of specialization. Acknowledge the connection between disciplines and topic areas</p>	<p>Teachers realize clearly about the topics they teach Value the subject content that relates to their area of expertise. Recognize the interconnectedness of content areas/discipline</p>	<p>Teachers know and understand what they teach Deep and broaden knowledge of teaching Understand education trends, policies, and curricula Keep update of local, national global, development</p>	-	-	<p>Comprehending subject contents Master subject contents Acknowledge educational trend both regional and global level Recognize educational policies and curricular Recognize the connection between subject contents and discipline</p>

Table 2: (Cont.)

Nessipbayeva (2012)	Mandal (2018)	SEAMEO- INNOTECH et al. (2018)	Caena and Redecker (2019)	Rwanda Education Board (2019)	This Study
<p>-</p> <p>Create and implement lessons based on study plan</p> <p>Integrating 21st century skills and content in instruction</p>	<p>-</p> <p>Design and implement lesson effectively</p> <p>Integrate 21st century skill in teaching and learning</p>		<p>Teaching and learning</p> <p>Plan and design instruction</p> <p>Assessment assess students' performance</p> <p>Analyze student performance</p> <p>Provide feedback</p>	<p>Teachers plan and assess learning</p> <p>Plan learning outcome and objectives reflect the national curriculum, subject syllabus and the abilities, needs</p> <p>Monitor and access learning and participation</p> <p>Use assessment information for learning and teaching</p>	<p>Teaching pedagogy</p> <p>Plan and design lesson</p> <p>Intergrade 21st century teaching approach in instruction</p> <p>Evaluate student performance and provide feedback</p>

Table 2: (Cont.)

Nessipbayeva (2012)	Mandal (2018)	SEAMEO- INNOTECH et al. (2018)	Caena and Redecker (2019)	Rwanda Education Board (2019)	This Study
<p>Teachers create a friendly environment for a variety of students Maintain a positive and nurturing learning environment Embrace diversity in the school community and in the world Treat students as individuals Adapt teaching for the benefit of students with special needs</p>	<p>Teachers foster learning environment Promote joyful learning environment Embrace diversity in the school community and in the world Treat students individually Apply multiplicity resources in instruction for the benefit of students with special needs</p>	<p>- Encourage respect, diversity</p>	<p></p>	<p>Teachers establish and maintain a friendly learning environment Ensure a clean and safe classroom, Develops an inclusive and welcoming atmosphere in class Maximize learning time</p>	<p>Establishing a positive learning environment Ensure a safe and clean learning environment Maintain an inspire and nurture learning environment Respect to diversity Treat student fairly Utilize multi teaching-learning resources Ensure a proper learning time</p>

Table 2: (Cont.)

Nessipbayeva (2012)	Mandal (2018)	SEAMEO- INNOTECH et al. (2018)	Caena and Redecker (2019)	Rwanda Education Board (2019)	This Study
<p>-</p> <p>Interact and communicating ideas with the family and community</p>	<p>-</p> <p>Build connection with community</p>	<p>Teachers engage with community</p> <p>Evolve the community in supporting student learning</p> <p>Partner with students' family</p>		<p>Support students' learning at school and in community</p> <p>Provides regular and accessible information of student learning to students and their families</p> <p>Works with others to ensure the school environment is clean</p> <p>Identifies local resource people to assist with ECA that link school learning to community</p>	<p>Engaging with parents and community</p> <p>Communicate with parents and community</p> <p>Collaborate with stakeholders</p>

Table 2: (Cont.)

Nessipbayeva (2012)	Mandal (2018)	SEAMEO- INNOTECH et al. (2018)	Caena and Redecker (2019)	Rwanda Education Board (2019)	This Study
<p>Teachers inspire their students in learning Observe students' characteristic and provide facilitation Implement instruction appropriately Apply competence and flexibility Use technology Promote students' critical thinking Approach their students Ensure students' 21st century skills</p>	<p>Teachers simplify learning for students Employ appropriate level of instruction Allocate and create materials in teaching and learning Use technology Promote critical thinking and problem solving Reach their students Improve student progress and 21st century skills</p>	<p>Teacher help student learn Know students Use the most effective teaching and learning method Assess and give feedback on students' performance</p>	<p>Empowering learners Develop learning experiences and activities addressing students' needs Utilize digital technologies to encourage differentiation and personalization by allowing different levels and speeds, individual learning pathways and objectives</p>	<p>Teachers facilitate activities and use resources for learning Provide a range of learning activities Give instruction and guidance Use teaching and learning resources Interact to make learning possible Use the medium of instruction Use multiplicity communicative resources Use questions facilitate learning</p>	<p>Inspiring students in learning</p>

Table 2: (Cont.)

Nessipbayeva (2012)	Mandal (2018)	SEAMEO- INNOTECH et al. (2018)	Caena and Redecker (2019)	Rwanda Education Board (2019)	This Study
			<p>Facilitating students’ digital competence Facilitate students’ digital competence Enable them to manage risks and use digital technologies safely Promote information and media literacy Integrate activities to enable digital problem solving, digital content creation and digital technology use for communication in learning</p>		<p>Inspiring students in learning Manage appropriate level of instruction Provide incentive for student Help students in learning Design interesting learning activities Utilize fascination resources</p>

Table 2: (Cont.)

Nessipbayeva (2012)	Mandal (2018)	SEAMEO- INNOTECH et al. (2018)	Caena and Redecker (2019)	Rwanda Education Board (2019)	This Study
			<p>Digital resources Select, create, modify, and manage of digital educational resources</p>		<p>Digital competencies Make use of appropriate digital tools Ensure student access to digital learning Inform the risk of digital Intergrade digital learning in instruction Utilize digital to facilitate school work</p>

Table 2: (Cont.)

Nessipbayeva (2012)	Mandal (2018)	SEAMEO- INNOTECH et al. (2018)	Caena and Redecker (2019)	Rwanda Education Board (2019)	This Study
<p>Teachers evaluate their own practices Analyze student learning Link professional growth to their professional goals Work well in a complicated, dynamic setting</p>	<p>Teachers reflect their professional work Use data to analyze student progress Keep upgrading professional development Be able to work in complex situation</p>	<p>Teachers upgrade themselves every day Be Self-awareness Improve Professional practices Master teaching practice</p>	<p>Professional engagement Utilize digital learning opportunities and technology to facilitate collaboration with colleagues, students, parents, and others Emphasizes the significance of teaching reflecting on their teaching approaches both individually and collectively</p>	<p>Teachers engage in professional development Continually improve teaching and learning Use CPD opportunity and resources Collaborate to plan and access teaching and learning</p>	<p>Reflecting professional practices Follow up student progress Improve professional practice Keep up date new knowledge Suggest feedback from peer Improve teaching strategies</p>

Base on the above synthesizing, the researcher gets eight components of teachers' 21st century teaching competencies from the predominate framework of Nessipbayeva (2012), Mandal (2018), SEAMEO-INNOTECH et al. (2018), Caena and Redecker (2019), and Rwanda Education Board (2019). The components of 21st century teaching competencies are discussed as follows:

1) *Exercising teacher leadership*

Teachers are leaders when they participate in professional work communities to influence student learning, improve schools, encourage practice excellence, and engage stakeholders in educational progress (Childs-Bowen, Moller and Scrivner, 2000, p. 28). Nessipbayeva (2012) and Mandal (2018) indicated that teachers exercise teacher leadership through managing effective classrooms, participating in school professional activities, evolving in professional development, building professional relationships, implying educational policies, and exhibiting moral standards.

In this study, teachers exercising leadership refers to the ability of teachers to display administrative role insight or oversight the classroom regarding managing the effective classroom, participating in school professional activities, evolving in professional development, building professional relationships, implying educational policies, and exhibiting moral standards.

2) *Comprehending subject contents*

In order to ensure that students learn following current educational requirements, teachers must have a clear understanding of their subject matter and be flexible to integrate concepts with other disciplines in order to organize the current practical lesson for students.

The studies of Nessipbayeva (2012) and Mandal (2018) stated that in order to improve student learning, teachers respond to design lessons effectively by integrating literacy subject areas in line with the curriculum. Teachers must also imply the subject matter into instruction at an adequate level. Moreover, teachers combine the subject contents with other recent disciplines and 21st century skills to ensure the quality of learning. It is in line with SEAMEO-INNOTECH et al. (2018), who claimed that teachers must be able to expand and broaden their knowledge of what to teach,

recognize educational trends, policies, and curriculum, and stay current on local, national, regional, and international events.

Here in this study, comprehending subject contents refers to the ability of teachers to acknowledge their subject-matter expertise and know how to integrate the subject contents with 21st century skills in order to provide students with new knowledge.

3) *Teaching pedagogy*

In educational contexts, pedagogy refers to merely instructional strategies, while; teaching refers to contextual and reflective activity that calls for teachers to use their expertise in interpreting professional events (Cuenca, 2010).

It is seen that the terms teaching and learning by Caena and Redecker (2019) and teachers plan and assess learning by Rwanda Education Board (2019) have similar meanings. However, Caena and Redecker (2019) intended to integrate teaching and learning activities with technology. Rwanda Education Board (2019) refers the term teachers plan and assess learning as the responsibility of teachers to unit lesson plans in line with the national curriculum, subject curriculum, and student's abilities, needs, and interests. Planning incorporates the actions to accomplish explicit, quantifiable learning objectives and outputs. Another important task of a teacher is monitoring student attention in classroom activities, and if necessary teachers must provide more go-ahead incentives for students to help each other. Teachers need to regularly evaluate student learning progress by using assessment data to provide students with thorough feedback.

Similarly, Caena and Redecker (2019) defined the term teaching and learning as the ability of teachers to plan and design instruction. However, the main focus of their study is to integrate digital technologies into teaching and learning. It emphasizes the using digital tools and resources to foster collaborative and self-managed learning processes and the necessity of implementing efficient support with learner-led. They also mentioned using digital assessment tools to evaluate student performance and educational needs in order to enhance student progress.

Here in this study, teaching pedagogy refers to the ability of the teacher to create learning goals and outcomes, measure and evaluate students' progress and use assessment data to inform teaching and learning.

4) Establish a positive learning environment

Learning environments refer to the various settings, such as the physical space (outdoor location, library, or computer room), social circumstances, and cultural contexts that influence learning (Korhonen et al., 2014).

Nessipbayeva (2012) and Mandal (2018) mentioned that the teachers' role in establishing a positive learning environment is to provide a warm-welcome learning atmosphere for students to nurture their relationships with others. Teachers then need to embrace diversity in learning by managing instruction that challenges stereotypes and recognizes the contributions of all cultures. In addition, teachers must treat each student respectfully and help those with disability. Evolving students' parents and community in school is another responsibility of teachers. It is consistent with Rwanda Education Board (2019), which elaborated that teachers can establish and maintain a friendly learning environment by ensuring a clean and safe classroom. In addition, teachers create an inclusive and welcoming learning environment by treating all students with respect at all times and being punctual. Furthermore, teachers must respond properly if there are unexpected interruptions to the classroom while students are learning.

In this study, establishing a positive learning environment refers to teachers' ability to promote a physically and mental health learning environment where students feel comforted, inspired, and enjoy learning.

5) Engaging with parents and community

Students will learn better when family and community members provide support in their studies. It helps students feel more inspired and encouraged to challenge coursework. SEAMEO-INNOTECH et al. (2018) indicated that engaging the community is the capacity of teachers to involve parents, caregivers, and the community in students' learning process. As so, teachers ensure the vital supporting learning environments for students. Similarly, Rwanda Education Board (2019) defined professional engagement as the ability of teachers to provide students and parents with regular information about student learning and identifies community resources used for learning.

In this study, the term engaging with parents and community refers to the ability of teachers to involve student families and community in their children's learning

while putting effort to cooperate and interact with all related stakeholders to establish trust and link learning between home and school.

6) *Inspiring students in learning*

Learning how to inspire students is among the most crucial skills of teachers. Lack of motivation among students will hinder their ability to learn. Students are willing to perform well through their interest in a subject, past achievements in that area, the need to impress their parents or teachers, or just their drive to succeed.

Nessipbayeva (2012) and Mandal (2018) stated that teachers demonstrate their effective teaching strategies by determining the developmental stages of specific students and planning instruction accordingly. They also help students by estimating the needs of their students and using the necessary resources to solve teaching and learning problems. Furthermore, teachers respond by planning and integrating technology appropriately in the instruction to ensure students' proper learning. Another significant duty of teachers is to prepare lessons for students' critical thinking, creativity, and teamwork improvement.

It is in parallel with SEAMEO-INNOTECH et al. (2018), which mentioned that understanding students, using the best teaching and learning techniques, and evaluating and providing feedback on student progress are all crucial factors that teachers use to develop inspirational teaching and learning. Similarly, Rwanda Education Board (2019) indicated that teachers inspire their students to learn by offering a variety of learning activities, giving students chances to apply their knowledge. Moreover, teachers must explain clear learning goals to students while explaining the lesson simply. The teachers should praise or offer feedback to students when they complete the tasks. More importantly, teachers need to allocate a variety of resources to facilitate teaching and learning.

Meanwhile, Caena and Redecker (2019) mentioned that it is necessary to integrate technology into teaching and learning. The term empowering learners places a significant focus on the value of developing educational experiences and activities that cater to students' needs and enable them to be active in learning. Through using of technology, teachers will inspire and promote differentiation and personalization. They will inspire students to engage in digital learning activities, ensuring students have equal access to technologies.

In this study, inspiring students in learning refers to the ability of teachers to encourage their students to learn by offering a multiplicity of teaching and learning strategies. Therefore, teachers must prepare clear lesson plans, allocate a variety of resources and integrate technology into the teaching process. Furthermore, teachers need to monitor students' progress regularly in order to assist help for students on time.

7) *Digital competencies*

The creation and widespread use of printed texts made schooling feasible. Thus, technology has always been an element of education. Despite the enthusiastic support of educators, several technologies have failed to make a substantial impact in classrooms (Swan, 2008). Caena and Redecker (2019) emphasized digital resources competency as the selection, creation, modification, and management of digital educational resources to apply in the teaching and learning process, and it also refers to upholding copyright rules and protecting personal information following data protection laws.

Here in this study, the term digital competencies refers to the ability of teachers to recognize when and how to employ technology in education to improve student learning.

8) *Reflecting professional practice*

Numerous researchers concur that teacher practices and behavior are significant school-based elements in enhancing student learning. Professionalism encompasses the characteristics of teachers entire school work (Korhonen et al., 2014).

Teachers reflect their professional practice through the actions such as using data to examine student learning and offering feedback to them, linking their professional goals to their professional growth, participating in professional learning and development (Nessipbayeva, 2012; Mandal, 2018), identifying themselves and others, living a decent life, mastering teaching strategies SEAMEO-INNOTECH et al. (2018), and utilizing several research-validated techniques to work in a complex and dynamic setting.

Meanwhile, Caena and Redecker (2019) addressed that teachers reflect their professional practices by employing the practical application of digital technologies and evaluating students' learning and performance to provide feedback to

their students. Rwanda Education Board (2019) addressed that teachers reflect on their practice by evaluating their instruction and how it affects students' learning regularly. Likewise, teachers can reflect on their teaching with the middle leader or a mentor by inviting them to observe casual lessons in their classrooms. They also use their weekly CPD time to advance their professional knowledge and abilities.

In this study, the term reflecting professional practices refers to the ability of teachers to ensure the efficiency of professional work and teaching by evaluating their professional practice. Teachers evaluate their practices by observing the progress of students and the professional growth of teachers themselves, including integrating new teaching strategies with technology and building connections with stakeholders.

3. The Relationship between Principals' Instructional Leadership and Teachers' 21st Century Teaching Competencies

The significance of learning 21st century skills and practices, which go beyond conventional subject learning, is widely discussed on a global scale. The requirements for 21st century skills such as problem-solving, and other soft skills all appear to demand new and modern learning strategies. This may require the new learning standard needs support from pedagogies and technology (Chu et al., 2014; González-pérez and Ramírez-montoya, 2022; Rajoo et al., 2022). Teachers of the 21st century must be proficient in both instructional methods and academic subjects, as well as in utilizing technology in the classroom, and they must develop students with soft skills and ICT skills. The teaching-learning process needs to be changed from a teacher-centered or instructor-based setting to a student-centered (Jan, 2017).

After all, the teacher is a significant factor in providing efficient lessons in the classroom. They are required to retain a significant body of knowledge and be proficient in curriculum development and instruction. Meanwhile, the principal responds to promote a positive learning environment that encourages the most effective teaching strategies. The principals need to remain a deep understanding of teacher and student context, technology, as well as school culture to manage the school development plan accordingly. Thus, principals need to establish a collaborative relationship with personnel and stakeholders to ensure school improvement (Hoy and Hoy, 2006).

Leonard (2010) mentioned that school principals in the 21st century struggle to keep up with the demands imposed on their profession. Hence, they need to work smarter to improve school instructional programs. Many pieces of literature on school improvement showed that the significance of the instructional leadership role for principals is a key factor in education. They discovered that instructional leadership included “The ability of leaders 1) to stay consistently focused on the right stuff, the innovation of schooling, teaching and learning, curriculum, and assessment and 2) to ensure other dimensions of schooling (e.g., administration, organization, and finance) supported a fundamental use of technology and enhanced student learning”.

Ismail, Husin and Khalid (2018) looked at the relationship between teachers’ functional competency and school leaders’ instructional leadership at prestigious schools in Peninsular Malaysia’s northern region. He adopted the Principal Instructional Management model of Hallinger and Murphy (1985) and two dimensions of the teachers’ functional competency, including teachers’ knowledge and teachers’ skills. The study discovered that teachers had very high levels of functional competency (Mean=4.23, SD=.41) and leaders had a high level of instructional leadership (Mean=3.94, SD=.55). The results also showed a significant association between teachers’ functional competency and school leaders’ instructional leadership ($r = .956$, $p = .000$). It further indicated a weak positive though significant relationship ($r = .345$, $p = .000$) between teachers’ skills and school leaders’ instructional leadership and averagely strong positive significant relationship ($r = .397$, $p = .000$) between teachers’ knowledge and school leaders’ instructional leadership. This study illustrated the ability of instructional leadership practices to impact teachers’ functional competency.

Ismail, Mansor, Iksan and Nor (2018) investigated the influence of principals’ instructional leadership on science teaching competency. This study used the instructional leadership model of Hallinger and Murphy (1987). They proposed nine dimensions, including 1) framing clear school goals, 2) communicating clear school goals, 3) coordinating curriculum, 4) monitoring student progress, 5) protecting instructional time, 6) promoting professional development, 7) maintaining high visibility, 8) providing incentives for teachers, and 9) providing incentive for students. The science teaching competency dimensions included 1) knowledge and

understanding, 2) teaching and learning skills, and 3) teachers' professional development practices. The findings demonstrated that nine of the adopted dimensions for instructional leadership variables were significant with a loading factor ranging from 0.70 to 0.84. The variables of science teaching competency were also significant with a loading factor of 0.81 to 0.95. The results showed that instructional leadership has a substantial impact on science teaching competency. Thus, they suggested that the principal's instructional leadership can improve science teaching competencies.

Iqbal (2021) studied the effects of principals' instructional leadership on teaching and learning practices. The objective of his study was to emphasize the relationship between the teaching-learning practices of instructors and instructional leadership variables. The result showed a moderate link between instructional leadership and teaching-learning practice. It was seen that principals' instructional leadership influenced students learning. This study found that there was a moderate positive relationship between instructional leadership and teaching-learning practices. In line with this study, Hallinger et al. (2020) found that instructional leadership significantly impacted student learning and accomplishment.

According to Blasé and Blasé (1998, 1999) research, when instructional leaders continually monitor and offer feedback on the teaching and learning process, there is an increase in teachers reflecting on professional practice, acknowledging novel ideas, adapting a variety of teaching strategies, respecting student diversity, planning and preparing lessons accordingly, taking a leadership role, and focusing on the instructional practice greatly. The results also indicated that teacher impact on students' motivation, happiness, confidence, and sense of security.

4. Education System and Educational Reforms: Charter Schools in Cambodia

4.1 Education system in Cambodia

The Ministry of Education, Youth, and Sport currently oversees Cambodia's educational system. The country's education policies, plans, and programs are formulated, directed, and monitored by the MoEYS. The implementing agents are the Provincial/Municipal Office of Education (POE), District Office of Education (DOE), and individual schools (MoEYS, 2019). The contemporary public education system of

Cambodia comprises three years of preschool education; six years of primary education (grades 1–6); six years of secondary education, which includes three years of lower secondary (grades 7–9); three years of upper secondary (grades 10–12); and a higher education level of four years of undergraduate education, two years of master’s degree and three to six years of Ph.D.

1) ***Cambodia’s vision of the school for 2030:*** Schools are expected to have administrative and financial autonomy and be held responsible for guaranteeing that all children receive the best education. It started with promoting enthusiastic, experienced professors with educational backgrounds. Schools will provide teaching and learning environments that are safe, wholesome, inclusive, gender-responsive and technologically cutting-edge.

2) ***Cambodia’s vision of teachers for 2030:*** All teachers are required to be professionally competent, driven, and supported. Teachers must also possess the necessary academic resources and pedagogical skills, as well as a passion for teaching and compassion for their students. The teaching profession needs to be improved to ensure the most qualified and enthusiastic personnel. Teachers will continually get assistance in acquiring new knowledge and abilities that best support student learning. Teaching must be an ethical profession where teachers uphold the professional standards.

3) ***Cambodia’s vision of a classroom 2030:*** Classrooms will be renovated and transformed into smart classrooms that offer carefully planned, secure, and appropriate learning environments for everyone. The smart classrooms will be well-equipped with educational and technological resources. Teachers’ duties are transferred to learning facilitators, who use pedagogical strategies and interactive, collaborative instructional methods to offer learning opportunities for all students.

4) ***Cambodia’s vision of a student for 2030:*** All Cambodian students must be disciplined, prepared, and enthusiastic learners. Teachers, family, and the community must all be professionally capable and qualified to support the youngsters. In order to contribute to and actively engage in society, graduates must retain both hard and soft skills, good moral judgment, emotional intelligence and a sense of national and global citizenship.

Consequently, in 2030 Cambodia's education vision of the school is to be a learning organization ensuring high-quality education for all. Teachers, as competent professionals, must be able to use smart classrooms and provide learners with high-quality instruction to ensure the quality of learning.

4.2 Educational reforms: Charter Schools

The Country's educational system faces numerous difficulties as it moves into the 21st century. The integration of all ASEAN member states, increased economic competition, rapid technological penetration, rising urbanization, expansion of private schools, and a sizable youth population needed intensive guidance are recent challenges that Cambodia confronts. In 2013, the high levels of public unhappiness with schooling increased, resulting in ongoing deficiencies in secondary school education. It is mostly manifested by a middle-class outflow from public schools that leads to static net enrollment rates. Therefore, reforming the educational system has become a key priority since 2013 (Bredenberg, 2018). MoEYS then intend to place a strong premium on raising the standard of instruction at both the primary and secondary school levels. The development and implementation of the new reform package indicate in Figure 3 as follows:

Figure 3: New Educational Reforms Agenda (2014) (Bredenberg, 2018)

- New Educational Reform Agenda (2014)**

 1. Strengthen in-depth reform of public finance management
 2. Strengthen personnel management
 3. Examinations reform
 4. Create a think-tank to stimulate educational innovation
 5. Reform higher education
 6. Improve educational quality
 7. Develop technical & soft skills
 8. Reform physical education and sport

Most reforms mainly focus on the secondary education subsector, including examination reform (abolishing the Diploma Examination in Grade 9) and cleaning up the administration of the Bac II Examination (Grade 12). The Ministry saved millions of dollars by eliminating the Grade 9 Leaving Test, which it then used to fund initiatives to increase teacher salaries. Increasing teacher salaries at all levels, particularly at the secondary school level is another priority strategy to process educational reform. However, it has been viewed that MoEYS had little influence over teachers' decisions to reduce their private tutoring and teach the full complement of hours each week. In this regard, it should be emphasized that many secondary school teachers, despite being paid as full-time civil servants, only put in a small portion of the requisite official hours (Bredenberg, 2018).

There are several essential aspects of the present wave of educational reforms that set them apart from past initiatives. In this regard, a crucial point of comparison relates to the necessity of departing from one-dimensional development models that treat every school; as if it were the same. This insight stems from the poor returns on past investments made to improve educational standards but failed to account for the significant differences in quality between schools, notably in matters of school

governance. The poorly managed schools wasted the resources given to them. Meanwhile, schools with good administration were more likely to spend resources efficiently. Due to this insight, secondary schools are now more open to receiving various development tracks that involve varying amounts of funding, depending on the capacity of the school to allocate those funds. Nevertheless, the establishment of the Charter School Movement aims to ensure independent public secondary schools with the independence needed to innovate and raise educational standards, which has emerged as one of Cambodia's most radical experiments in improving the quality of education. In Cambodia, Charter Schools are referred to as New Generation Schools and are primarily concerned with MoEYS's new reform agenda (KAPE, 2014).

5. New Generation Schools in Cambodia

Given the Country's limited resources, distributing them too thinly across the entire nation will prevent the improvement of educational quality. What is required is a second development path that will enable the government to continue supporting the most fundamental requirements of every school while allowing for intensive and concurrent investment in other schools to achieve the highest educational learning standards. The establishing of New Generation Schools is to guarantee that the significant investment provided for those schools is paired with strong enforcement of accountability for performance criteria (Bredenberg, 2018).

The creation of New Generation Schools is known as a new development path of public autonomous schools that receive significant funding to increase higher standards of governance and accountability and 21st century professional learning. New Generation Schools, as the model of innovation schools, will provide a new standard of education in the public schools to prepare Cambodian youth for the 21st century competition. New Generation Schools are granted operational autonomy to improve educational services and allocate resources accordingly. MoEYS proposed many core principles that define the New Generation Schools. These principles are shown in the following figure:

Figure 4: The Principles of New Generation Schools (MoEYS, 2019)



New Generation Schools are anticipated to use their operational discretion to foster innovation. The innovation comes in a variety of forms, including improving curricula, enhancing ICT in education, providing students' career counseling services, establishing various learning channels to accommodate students' strengths and interests, and equipping the 21st century library (e.g., e-library, media, etc.). When deciding which innovations need to be promoted, New Generation Schools considered the interests of the students and the communities. New Generation Schools reform entails longer class hours, increases more hours of teachers' instruction, and assigns smaller class sizes.

Teachers of New Generation Schools will be expected to fully utilize new learning resources, such as science labs, libraries, and smart classrooms. Enforcing a new governance policy will ensure that teachers can fulfill their professional work effectively. All teachers in New Generation Schools are required to utilize technology in teaching-learning. Teachers are encouraged to design electronic lesson planning, use LCD projectors in classroom presentations, conduct online research, and apply software-driven learning. Furthermore, teachers will be required to set professional

goals, cooperate with school principals and technical subject leaders, and join regular meetings to reflect on their professional work.

The Specific objectives for New Generation Schools Policy Guidelines including:

- 1) Create independent public schools governed by strict rules of performance accountability linked to high investment.
- 2) Create new governance boards that will hold schools accountable for their performance.
- 3) Create an accreditation system that will facilitate Oversight Board decision-making about a school's adherence to New Generation School core principles.
- 4) Use new institutional freedoms (i.e., operational autonomy) to drive innovation in the way educational services are formulated and delivered.
- 5) Replace the inefficient and socially inequitable system of informal private tutoring with a rationalized resource allocation system that enhances educational services.
- 6) Improve teaching standards through new approaches that include (i) competitive teacher recruitment, (ii) performance-based incentives, (iii) intensive capacity-building in educational technology; (iv) STEM and problem-based learning methodologies; and (v) explicit teacher career paths linked to professional development opportunities (e.g., teacher scholarships for future study).
- 7) Enhance educational services for Cambodian youth that will include career counseling services, differentiated learning channels (e.g., subject clubs), mobile learning, and life skills education.

The establishment of New Generation Schools will take in multiple strategies including the following:

- 1) **Rigorous School Selection:** MoEYS will select schools carefully based on their capacity to effectively use large investments.
- 2) **Partnerships:** MoEYS will forge a strong collaboration with NSAs and private sector to support the Ministry in the implementation and funding of New Generation Schools.
- 3) **School Accountability:** A new National Oversight Board will be established by MoEYS to strictly enforce the criteria for the New Generation School

designation, and it will use a variety of strategies to increase accountability of school managers, including competitive hiring of managers, incentives linked to high performance, and withdrawal of NGS accreditation and investment in cases where schools no longer meet the agreed-upon criteria.

4) Direct Control of New Generation Schools from National Levels: MoEYS will direct the management of these independent public schools classified as New Generation Schools from a national level due to ongoing challenges with local capacity and the significant investment that the government will make in these schools. A National Oversight Board that MoEYS established at the federal level will be used to exercise this control . As the number of New Generation Schools rises in the coming years, MoEYS will work to eventually transfer this authority to Local Boards and will make the necessary changes to the current policy.

5) Teacher Incentives: MoEYS would not allow any private tutoring activities that violate the rules of professionalism in the interactions between teachers and students, as well as offer additional incentives for teachers to strategically improve performance.

6) Operational Autonomy linked with Innovation: As long as schools can display how planned changes would foster innovation and improve educational quality, they will be permitted to operate outside of the regulatory framework that applies to conventional schools. These freedoms may pertain to curricular changes, the use of technology to improve educational efficiency (e.g., electronic lesson plans, m-Learning, etc.) or other types of educational innovation. They may also apply to the hiring of teachers from outside the school system. Provisions for operational independence will depend on innovation evidence.

7) Intensive Use of Technology to Drive Innovation: A crucial component of New Generation Schools will be the use of technology, which includes not just having access to hardware but also introducing new educational software that will improve teaching, learning, and evaluation (such as Literatu, 3D Classroom, etc.).

8) Youth Empowerment: The implementation of New Generation Schools will be done in a way that allows students to have greater involvement in governing the new facilities and services. Youth Centers should be made available in New Generation

Schools so that students can plan special events, use school-provided fund for special investments, and access counseling services.

9) Increased Hours of Instruction: The number of hours of teaching will be added to 36 hours per week for primary schools and 40 hours per week for secondary schools. New Generation Schools will ensure that teachers adhere to official guidelines requiring them to teach full time. (18 hours per week for lower secondary school teachers and 16 hours per week for upper secondary school teachers).

10) Introduction of Subject Themes: New Generation Schools will be obligated to use increased hours of instructional time in order to provide access to specific subject themes that might concentrate on STEM subjects, foreign languages, or other topics of interest to the neighborhood.

11) Social Equity: It will be necessary for New Generation Schools to express that they are taking care of the community's most vulnerable residents. The MoEYS will establish a Social Equity Fund that will give schools access to additional monies to aid the underprivileged in order to encourage outreach to the underprivileged. Additionally, all unofficial fees that disproportionately harm the poor will be eliminated.

12) School in a School Model: It might be difficult to recruit new staff members or make personnel changes in existing schools, which makes converting them to New Generation Schools a challenging task. MoEYS will choose-fully use a "School within a School" model to address this issue, in which it will establish new structures that are integrated into the school but are yet distinct from it. This school within a school will have the ability to implement competitive hiring of management and instructors, selective student identification (for example, through exams), developing new curricula, and other practices that are fundamental to the New Generation School concept.

13) Reduced Pupil Teacher Ratios: Authorize schools to have a smaller number of students in each classroom in order to improve personalized instruction.

14) Changing Individual Mind Sets: To adapt their behaviors to the demands of 21st century learning, all school-level stakeholders, students, parents, administrators, and teachers must change.

15) Modernizing Learning Environments: Convert classrooms and the other school facilities to meet 21st century standards by using novel concepts in educational design.

6. Related Research and Studies

Innovation in education impacts the learning environment. Cutting-edge classrooms encourage students to build their communication skills and engagement opportunities. Teachers in the 21st century need to assess their modern teaching methods to meet student's requirements. Teachers must be able to modify their teaching approach equipped with technology. The collaboration between principals and teachers is acquired in school improvement while evolving students' parents, stakeholders, and community. Purkey and Smith's (1983) offered compelling evidence that instructional leadership affects the technical foundation of schools. It is in line with many pieces of literature, which found that an instructional leader significantly impacts teaching and learning (Weber, 1971; Brookover and Lezotte, 1977; Edmonds (1979).

Khun-inkeeree, Ahmad, and MohdSofian (2018) studied the relationship between principals' instructional leadership and teachers' self-efficacy in a religious private school in Alor Setar District. This study used the dimensions of Hallinger and Murphy's Principals Instructional Leadership (1986) model. This model has three components: identifying the school mission, managing the curriculum, and developing a supportive learning climate. In addition, the Teachers' Self-Efficacy framework was adapted from Bandura (1997). The findings indicated that teachers' self-efficacy and principals' instructional leadership are at high level. Also, it is discovered that teachers' self-efficacy and principals' instructional leadership have a significant relationship ($r = 0.46$, $p < 0.01$). Therefore, instructional leadership should be used by the principal to develop teachers' self-efficacy.

Many different approaches and viewpoints have been utilized by researchers to examine the effect of school principals in implementing instructional leadership. In the study of May (2011), the scope of the principals' effort adopted a different strategy by looking at the breadth of key attempts to enhance instruction. She described how principals distribute their work with teachers. The findings showed that the scope of

principals' instructional leadership activities varies from school to school, ranging from very broad to a small number of teachers. It also showed a direct correlation between the frequency of a principal's instructional leadership activities with teachers and the size of the reported instructional changes. These results lend credence to the idea that principals who concentrate on the development of specific teachers while using broader strategies can result in more significant changes in instructional practice.

In the study of Liu and Huang (2022), they used a three-level structural equation model to examine the multifaceted links between principal and teacher instructional leadership, teacher efficacy, and student learning outcomes. They used the extensive survey data gathered in China. The findings implied that teacher and principal instructional leadership are significantly correlated. Although the effect sizes differ substantially, both are positively associated with teachers' self-efficacy and student achievement. Through an integrated paradigm that emphasizes the leadership roles of both principals and teachers, this study has provided global and nuanced evidence to the shared instructional leadership research.

Bellibaş, Polatcan and Kilinc (2022) investigated the instructional leadership effects on teachers adapting their classroom practices with the role of shared practice and learning effectiveness as mediators. The study used quantitative techniques and a cross-sectional survey approach. The information was gathered from 350 instructors at primary and secondary schools in different Turkish provinces. The data was analyzed by using confirmatory factor analysis and structural equation modeling. The findings offered a mediated link between instructional leadership and teachers' instruction with the full roles of shared practices among teachers and their sense of autonomy in learning effectiveness. This research concluded that teacher learning and collaborative practices among teachers are influenced by principals' instructional practices. The study also mentioned that instructional leadership enables a significant change in a variety of diverse classroom instruction components.

Suyudi, Rahmatullah, Rachmawati, and Hariyati (2022) tried to figure out how instructional leadership and innovative teaching affect students' performance in their academic endeavors. The study investigated the relationship between self-actualization and student satisfaction, principal instructional leadership, and teaching innovation.

The researcher used an across-sectional analysis to ascertain the link between exogenous and endogenous variables. The result revealed that the principal's instructional leadership and innovative instruction impact student learning satisfaction. It further indicated that student self-actualization is driven by the principal's instructional leadership whereas innovative teaching has no direct impact unless it is mediated by learner satisfaction.

CHAPTER 3

RESEARCH METHODOLOGY

This research study on “The Effect of Principals’ Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in New Generation Schools in Cambodia” was designed based on the objectives of the study as: 1) To study the level of principals’ instructional leadership of New Generation Schools, 2) To investigate the level of teachers’ 21st century teaching competencies in New Generation Schools, and 3) To examine the predictors of principals’ instructional leadership affecting teachers’ 21st century teaching competencies in New Generation Schools.

1. Population and Sample Population

Population: The population of this study included 502 teachers from 10 New Generation Schools (NGSs) which are public primary schools and public secondary schools under the jurisdiction of Ministry of Education, Youth and Sport in Cambodia.

Sample Population: The sample population of this study consisted of 223 teachers from 10 New Generation Schools that were determined by using the formula of Taro Yamane (1973) with a 5% sampling error at a 95% confidence level. Stratified random sampling was utilized to select the sample size of the study.

The following formula was used to calculate the sample size of this study:

$$n = \frac{N}{1 + Ne^2}$$

- n refers to the Sample Size
- N refers to the Population size
- e refers to the acceptable sampling error

$$n = \frac{502}{1 + 502 \times (0.05)^2} = 223$$

The teachers sample of each school were chosen by using Proportional Stratified Random Sampling in order to get the size of sample proportional to the size of population.

Table 3: Population and sample size of teachers classified by schools

Schools	Schools Location (Province)	Teachers Population	Sample
Preah Sisowath (HS)	Phnom Penh	79	32
Prek Leap (HS)	Phnom Penh	91	42
Hun Sen Kampong Cham (HS)	Kampong Cham	34	15
Peam Chikorng (HS)	Peam Chikorng	64	30
Prek Anchanh (HS)	Kandal	80	38
Kok Pring (HS)	Svay Rieng	37	15
Anu Wat (PS)	Kampong Cham	22	10
Angkor Ban (PS)	Kampong Cham	25	11
Akhea Mahasei (PS)	Kampong Speu	49	20
Svay Prahutot (PS)	Svay Rieng	21	10
Total		502	223

(HS) = High Schools (PS) = Primary Schools

The table 3 above shows the total number of teacher informants in this study which consist of 223 teachers who teach in New Generation Schools.

2. Research Instruments

Instruments: The research instrument used in this study were questionnaires. The questionnaires consisted of three sections as follows:

Section 1: This section presents the Demographic Data of Informants. It is prepared in the check list form and presented in the first section of the questionnaire which consisted of gender, educational quality, teaching subjects, and professional work experiences.

Section 2: This section covers the questions which attributed to Principal's Instructional Leadership. There are 30 questions constructed for this part:

1. Developing and Sustaining School Vision (five items)
2. Managing Curriculum and Instruction (five items)
3. Promoting School Learning Environment (six items)
4. Supervising Teaching and Learning Process (five items)
5. Driving Data to Make Instructional Decision (five items)
6. Sharing Leadership (four items)

As Leedy and Ormrod (2005) stated that using a rating scale allowing multiple individuals to complete the same survey independently. The questions in this part were prepared in the 5-point Likert scales as following:

- 5 refers to practicing at the highest level
- 4 refers to practicing at the high level
- 3 refers to practicing at the moderate level
- 2 refers to practicing at the low level
- 1 refers to practicing at the lowest level

Section 3: This section presents the questions related to the Teachers' 21st Century Teaching Competencies. There are 32 questions constructed for this part as follow:

1. Exercising Teacher Leadership (four items)
2. Comprehending Subject Contents (four items)
3. Teaching Pedagogy (four items)
4. Establishing a Positive Learning Environment (four items)
5. Engaging with Parents and Community (four items)
6. Inspiring Students in Learning (four item)
7. Digital Competencies (four items)
8. Reflecting Professional Practice (four items)

The questions in this part were also prepared in the 5-point Likert scales as follow:

- 5 refers to practicing at the highest level
- 4 refers to practicing at the high level
- 3 refers to practicing at the moderate level
- 2 refers to practicing at the low level
- 1 refers to practicing at the lowest level

Conducting the Research Instruments: The procedure of formulating the questionnaires for this study was presented as follows:

- 1) Reviewed related documents then defining the concepts and theories of instructional leadership to define its components.
- 2) Reviewed related documents then defining the concepts and theories of teachers' 21st century teaching competencies to define its components.
- 3) Reviewed the 5-point Likert scales structure to create the questionnaires from related documents and research studies.
- 4) Proposed questionnaire to advisor and co-advisor in order to check and correct the questionnaire (language used and consistency).
- 5) Adjusted the questions and questionnaires base on the feedbacks and the suggestions of advisor and co-advisor.
- 6) Brought forward the revised questionnaires to the three selected experts for Content Validity evaluation (check on both content and language used).
- 7) Revised the questions and questionnaires base on the suggestions of the experts.
- 8) Calculated the values of IOC to examine the Content Validity result by using Rovanelle and Hambleton's formula as follows: (Sireci, 1998)

$$IOC = \frac{\sum R}{n}$$

IOC refers to Item Objective Congruence between -1 to +1

$\sum R$ refers to the total result of expert comments

n refers to the number of all experts

The principle of scoring:

+1 All the questions in the questionnaire are consistent with the content.

0 Not sure that all questions in the questionnaire are compatible with the content.

-1 All the questions in the questionnaire are inconsistent with the content.

The results were translated as follows: the items that score lower than 0.5 must be revised, and those that score higher than 0.5 are reserved. When the results from the three selected experts were calculated, each questionnaire item valued from 0.67 to 1.00 was selected for the next step.

9) Brought the Content Validity analysis results to discussion with advisor and co-advisor, then revise the questionnaire to make the final version of the questionnaire.

10) Brought the final version of the questionnaire to Try Out with 30 people (teachers that were not in the group of the research informants). The instrument's reliability was determined to ensure that the responses collected through the questionnaire were reliable and consistent.

The reliability value of the instruments was calculated by Cronbach's Alpha Value ruled by George and Mallery (2003) cited in (Saidi and Siew, 2019).

A number for the Cronbach's Alpha ranges from 0 to 1. The closer an item's internal consistency is near 1, the more reliable it is within the scale. According to George and Mallery (2003), Cronbach's Alpha values of 0.90 and above suggest excellent internal consistency, 0.80 and higher is good, 0.70 and higher is acceptable, 0.60 and higher is questionable, 0.50 and higher is poor, and 0.50 and lower is unsatisfactory.

Table 4: Cronbach' Alpha

Cronbach's Alpha	Internal Consistency
$\alpha \geq 0.90$	Excellent
$\alpha \geq 0.80$	Good
$\alpha \geq 0.70$	Acceptable
$\alpha \geq 0.60$	Questionable
$\alpha \geq 0.50$	Poor
$\alpha < 0.50$	Unacceptable

Source: George and Mallery (2003) cited in Saidi and Siew (2019)

Table 5: The Cronbach's Alpha Value of Principals' Instructional Leadership.

Components	Cronbach's Alpha	Result
1. Developing and Sustaining School Vision	.775	Acceptable
2. Managing Curriculum and Instruction	.778	Acceptable
3. Promoting School Environment	.755	Acceptable
4. Supervising Teaching and Learning Process	.790	Acceptable
5. Driving Data to Make Instructional Decision	.848	Good
6. Sharing Leadership	.724	Acceptable
Total	.934	Excellent

Based on the above table, it was seen that all the components of Principals' Instructional Leadership had the Cronbach's Alpha value higher than 0.60, which could be interpreted as all items in this part are acceptable.

Table 6: The Cronbach's Alpha Value of Teachers' 21st Century Teaching Competencies

Components	Cronbach's Alpha	Result
1. Exercising Teacher Leadership	.726	Acceptable
2. Comprehending Subject Contents	.748	Acceptable
3. Teaching Pedagogy	.705	Acceptable
4. Establishing a Positive Learning Environment	.762	Acceptable
5. Engaging with Parents and Community	.714	Acceptable
6. Inspiring Students in Learning	.735	Acceptable
7. Digital Competencies	.744	Acceptable
8. Reflecting Professional Practice	.711	Acceptable
Total	.932	Excellent
Overall	.950	Excellent

Based on the above table, it was seen that all the components of Teachers' 21st Century Teaching Competencies had the Cronbach's Alpha value higher than 0.60, which could be interpreted as all items in this part are acceptable. Thus, the instrument can be used for the next step which collecting data.

3. Data Collection

The Data Collection went through the following procedures:

- 1) Requested the official letter from the Faculty of Education of Prince of Songkla University and MoEYS in Cambodia. After that, the researcher asked for research cooperation from the provincial Office of Education, Youth and Sport, in Phnom Penh, Kon Dal province, Kampong Cham province, Kampong Spue province, and Svay Reing province. Then, the researcher contacted to school principals for informing and collaborating.
- 2) Processed to the target schools to collect data for this study by utilizing Questionnaires that were prepared.
- 3) Collected and checked the questionnaires completed before starting the data analysis.

4. Data Analysis

The informants' response to the questionnaire were analyzed as follows:

1) The demographic information of the research informants includes gender, educational qualification, teaching subjects and professional work experiences, and they will be analyzed by using descriptive statistics (frequency and percentage).

2) The results of the level of "Principals' instructional leadership of NGSs" were analyzed by using Mean and Standard Deviation. The ranges of the mean score are translated as follows (Best, 1981):

4.50-5.00:	having the highest level
3.50-4.49:	having the high level
2.50-3.49:	having the moderate level
1.50-2.49:	having the low level
1.00-1.49:	having lowest level

3) The result of the level of "Teachers' 21st century teaching competencies" were analyzed by using Mean and Standard Deviation. The ranges of the mean score are translated as follows (Best, 1981):

4.50-5.00:	having the highest level
3.50-4.49:	having the high level
2.50-3.49:	having the moderate level
1.50-2.49:	having the low level
1.00-1.49:	having lowest level

4) Test the Assumption of the Linear regression before processing the multiple regression analysis as follows:

4.1) Test the Normality through a statistical test known as Kolmogorov Smirnov test (Chakravart, Laha and Roy, 1967)

4.2) Check the Linear Relationship between the parameters of the independent variables and dependent variables.

4.3) Test for multi-collinearity based on VIF and Tolerance.

5) Analyzed the predictive variables of principals' instructional leadership to find the effective predictor variables on 21st century teaching competencies as perceived teachers in NGS by using Enter Multiple Regression Analysis.

6) Selected the best predictors of principals' instructional leadership based on the effect on the teachers' overall teaching competence (Beta value) and the most number of the positive effects on each teaching competencies.

CHAPTER 4

RESEARCH FINDINGS

In this chapter, it describes the results of the data analysis of the study “The Effect of Principals’ Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in New Generation Schools in Cambodia”, under the three main objectives as follows:

- 1) To study the level of principals’ instructional leadership of New Generation Schools.
- 2) To investigate the level of teachers’ 21st century teaching competencies in New Generation Schools.
- 3) To examine the predictors of principals’ instructional leadership affecting teachers’ 21st century teaching competencies in New Generation Schools.

The findings of this study are presented as follows:

1. Demographic Data of Informants
2. The Level of Principals’ Instructional Leadership of NGSs
 - 2.1 The overall level of principals’ instructional leadership of NGSs
 - 2.2 The level of the six components of principals’ instructional leadership of NGSs
3. The Level of Teachers’ 21st Century Teaching Competencies in NGSs
 - 3.1 The overall level of teachers’ 21st century teaching competencies in NGSs
 - 3.2 The level of the eight components of teachers’ 21st century teaching competencies in NGSs
4. The Predictors of Principals’ Instructional Leadership Affecting Teachers’ 21st Century Teaching Competencies in NGSs
 - 4.1 The predictors of principals’ instructional leadership affecting the overall teachers’ 21st century teaching competencies in NGSs
 - 4.2 The predictors of principals’ instructional leadership affecting each component of teachers’ 21st century teaching competencies in NGSs

4.3 The comparison of regression analysis equations between the overall teachers' 21st century teaching competencies and its components

1. Demographic Data of Informants

Section 1: It presents the results of demographic analysis of teacher informants. There were 223 teacher informants answered to the questionnaires for this study. The detail of the demographic data of teacher informants are shown as follows:

Table 7: Demographic data of informants (N=223)

Items	Characteristics	Count	Percentage (%)
1. Gender			
	Female	96	43
	Male	127	57
Total		223	100
2. Educational Qualification			
	Ph.D.	1	0.4
	Masters' Degree	43	19.3
	Bachelor Degree	156	70.0
	Associate Degree	6	2.7
	Others	17	7.6
Total		223	100
3. Teaching Subjects			
	Primary Teachers	51	22.9
	Math	30	13.5
	Physics	19	8.5
	Biology	15	6.7
	Chemistry	17	7.6
	Earth Science	4	1.8
	Khmer Literature	22	9.9
	English Literature	17	7.6
	Geography	9	4.0
	History	9	4.0
	Economic	2	0.9
	Moral-Civic	16	7.2
	ICT	10	4.5
	Physical Education	1	0.4
	Others	1	0.4
Total		223	100
4. Work Experiences			
	Less than 5 years	92	41.3
	5 to 10	72	32.3
	More than 10 years	59	26.5
Total		223	100

Table 7 shows that there were 223 of teacher informants which consisted of 96 female teachers (43%) and 127 male teachers (57%). The educational qualification of the teacher informants were divided into 5 categories. The teacher informants hold Ph.D. (0.4%), Master's degree (19.3%), Bachelor's degree (70.0%), Associate degree (2.7%) and other degree (7.6%). Among the 223 teachers informants comprised of primary school teachers (22.90%), mathematics teachers (13.50%), physics teachers (8.50%), biology teachers (6.70%), chemistry teachers (7.60%), earth science teachers (1.80%), Khmer literature teachers (9.90%), English literature teachers (7.60%), geography teachers (4.00%), history teachers (4.00%), economic teachers (0.90%), moral-civic teachers (7.20%), ICT teachers (4.50%), physics education teachers(0.40%), and other teacher(0.40%). For working experiences, teachers who have worked less than 5 years consisted of (41.3%), from 5 to 10 years (32.3%) and more than 10 years (59%).

2. The Level of Principals' Instructional Leadership of NGSs

Section 2: This section presents the results of analysis of the overall level of principals' instructional leadership of New Generation Schools and the level of its each component which consisted of 6 components such as 1) Developing and Sustaining School Vision, 2) Managing Curriculum and Instruction, 3) Promoting School Learning Environment, 4) Supervising Teaching and Learning Process, 5) Driving Data to Make Instructional Decision and 6) Sharing Leadership.

2.1 The overall level of principals' instructional leadership of NGSs

The results of analysis of the overall level of principals' instructional leadership of NGSs.

Table 8: Mean, Standard Deviation, and Level of principals' instructional leadership

No.	Principals' Instructional Leadership	\bar{X}	S.D.	Level
1	Developing and Sustaining School Vision	4.46	.363	High
2	Managing Curriculum and Instruction	4.35	.465	High
3	Promoting School Environment	4.24	.574	High
4	Supervising Teaching and Learning Process	4.31	.465	High
5	Driving Data to Make Instructional Decision	4.36	.417	High
6	Sharing Leadership	4.32	.468	High
Total		4.34	.313	High

Table 8 shows the overall level of principals' instructional leadership of NGSs which is at high level (Mean = 4.34, S.D. = .313).

The component that has the highest mean values is Developing and Sustaining School Vision (Mean = 4.46, S.D. = .363), followed by Driving Data to Make Instructional Decision (Mean = 4.36, S.D. = .417), Managing Curriculum and Instruction (Mean = 4.35, S.D. = .465), Sharing Leadership (Mean = 4.32, S.D. = .468), Supervising Teaching and Learning Process (Mean = 4.31, S.D. = .465) and Promoting School Learning Environment (Mean = 4.24, S.D. = .574).

2.2 The level of the six components of principals' instructional leadership of NGSs

The results of analysis of the level of the “Developing and Sustaining School Vision” component of principals' instructional leadership of NGSs.

Table 9: Mean, Standard Deviation, and Level of Developing and Sustaining School Vision.

No.	Developing and Sustaining School Vision	\bar{X}	S.D.	Level
1	Principals work with stakeholders to develop vision, mission, values, common goals and strategic plans for school development.	4.43	.556	High
2	Principals communicate vision, mission, values, common goals and strategic plans to create mutual understanding with stakeholders.	4.52	.544	Highest
3	Principals distribute clear tasks to school personnel to achieve the goals set out in the plan.	4.48	.560	High
4	Principals display their personal vision and serve as examples through their daily job.	4.43	.515	High
5	Principals have high expectations for students' academic performance.	4.45	.507	High
Total		4.46	.363	High

Table 9 describes the results of the level of Developing and Sustaining School Vision component of the principal's instruction leadership which has the highest mean value among other component (Mean = 4.46, S.D. = .363). The finding revealed that the item (2) “Principals communicate vision, mission, values, common goals and strategic plans to create mutual understanding with stakeholders” contained the highest mean value (Mean = 4.52, S.D. = .544) while the other items have the high mean value.

The results of analysis of the level of the Managing Curriculum and Instruction component of principals' instructional leadership of NGSs.

Table 10: Mean, Standard Deviation, and Level of Managing Curriculum and Instruction.

No.	Managing Curriculum and Instruction	\bar{X}	S.D.	Level
1	Principals facilitate curriculum which aligns with school vision.	4.47	.568	High
2	Principals monitor the implementation of the curriculum.	4.28	.566	High
3	Principals value the diversity of teachers' teaching strategies.	4.35	.580	High
4	Principals conduct research on the best teaching techniques to enhance successful teaching and learning.	4.49	.584	High
5	Principals provide the necessary resources for teachers to serve teaching and learning.	4.15	.902	High
Total		4.35	.465	High

Table 10 indicates that the level of Managing Curriculum and Instruction component of principals' instructional leadership of NGSs is at high level (Mean = 4.35, S.D. = .465). When considering on each item of the Managing Curriculum and Instruction component, the item that has highest mean value is (4) "Principals conduct research on the best teaching techniques to enhance successful teaching and learning" (Mean = 4.49, S.D. = .584) followed by (1) "Principals facilitate curriculum which aligns with school vision" (Mean = 4.47, S.D. = .568), (3) "Principals value the diversity of teachers' teaching strategies" (Mean = 4.35, S.D. = .580), and (2) "Principals monitor the implementation of the curriculum" (Mean = 4.28, S.D. = .566). The item that has the lowest mean value is (5) "Principals provide the necessary resources for teachers to serve teaching and learning" (Mean = 4.15, S.D. = .902).

The results of analysis of the level of the Promoting School Learning Environment component of principals' instructional leadership of NGSs.

Table 11: Mean, Standard Deviation, and Level of Promoting School Learning Environment.

No.	Promoting School Learning Environment	\bar{X}	S.D.	Level
1	Principals foster a safe, hygiene, and comfortable learning environment	4.22	.835	High
2	Principals have high expectations in setting the school standard.	4.19	.860	High
3	Principals promote a harmonious culture in the workplace.	3.92	1.114	High
4	Principals encourage teachers to participate in professional development activities.	4.30	.907	High
5	Principals encourage teachers to analyze student learning outcomes to develop students' performance.	4.46	.575	High
6	Principals encourage lifelong learning in school by providing equipment and multiple learning resources for teachers and students.	4.35	.533	High
Total		4.24	.574	High

Table 11 shows that the level of Promoting School Learning Environment component of principals' instructional leadership of NGSs is at high level (Mean = 4.24, S.D. = .574). It revealed that the item that has the highest mean value is (5) "Principals encourage teachers to analyze student learning outcomes to develop students' performance" (Mean = 4.46, S.D. = .575) followed by (6) "Principals encourage lifelong learning in school by providing equipment and multiple learning resources for teachers and students" (Mean = 4.35, S.D. = .533), (4) "Principals encourage teachers to participate in professional development activities" (Mean = 4.30, S.D. = .907), (1) "Principals foster a safe, hygiene, and comfortable learning environment" (Mean = 4.22, S.D. = .835), and (2) "Principals have high expectations

in setting the school standard” (Mean = 4.19, S.D. = .860). The item that has the lowest mean value is (3) “Principals promote a harmonious culture in the workplace” (Mean = 3.92, S.D. = 1.114).

The results of analysis of the level of the Supervising Teaching and Learning Process component of principals’ instructional leadership of NGSs.

Table 12: Mean, Standard Deviation, and Level of Supervising Teaching and Learning Process.

No.	Supervising Teaching and Learning Process	\bar{X}	S.D.	Level
1	Principals make time to visit the classroom.	4.17	.762	High
2	Principals provide feedback to teachers in order to improve teaching methods.	4.36	.606	High
3	Principal apply appropriate models to supervision and evaluation on teachers’ performance.	4.34	.569	High
4	Principals respect the expression of teachers.	4.31	.615	High
5	Principals keep an eye on the students’ academic progress.	4.35	.549	High
Total		4.30	.555	High

Table 12 indicates that the level of Supervising Teaching and Learning component of principals’ instructional leadership of NGSs is at high level (Mean = 4.30, S.D. = .555). When considering on each item, it showed that the item that has highest mean value among others is (2) “Principals provide feedback to teachers in order to improve teaching methods” (Mean = 4.36, S.D. = .606) followed by (5) “Principals keep an eye on the students’ academic progress” (Mean = 4.35, S.D. = .555), (3) “Principal apply appropriate models to supervision and evaluation on teachers’ performance” (Mean = 4.34, S.D. = .569), and (4) “Principals respect the expression of teachers” (Mean = 4.31, S.D. = .615). The item that has the lowest mean value is (1) “Principals make time to visit the classroom” (Mean = 4.17, S.D. = .762).

The results of analysis of the level of the Driving Data to Make Instructional Decision component of principals' instructional leadership of NGSs.

Table 13: Mean, Standard Deviation, and Level of Driving Data to Make Instructional Decision.

No.	Driving Data to Make Instructional Decision	\bar{X}	S.D.	Level
1	Principals use the past data such as the standardized test scores, attendance data, and behavior data as a baseline to find way to improve students' performance in the future.	4.41	.520	High
2	Principals use the past data as baseline data to evaluate teachers' performance.	4.48	.568	High
3	Principals analyze the school data first before he or she decides to develop any areas of the school.	4.24	.579	High
4	Principals regularly evaluate the results of the work in deciding how to solve the problem.	4.35	.566	High
5	Principals award the excellent teachers or students based on the proper evidence of data being collected.	4.33	.620	High
Total		4.36	.418	High

Table 13 indicates that the level of Driving Data to Make Instructional Decision component of principals' instructional leadership of NGSs is at high level (Mean = 4.36, S.D. = .418). When considering on each items, it showed that the item that has highest mean value among others is (2) "Principals use the past data as baseline data to evaluate teachers' performance." (Mean = 4.48, S.D. = .568) followed by (1) "Principals use the past data such as the standardized test scores, attendance data, and behavior data as a baseline to find way to improve students' performance in the future" (Mean = 4.41, S.D. = .520), (4) "Principals regularly evaluate the results of the work in deciding how to solve the problem" (Mean = 4.35, S.D. = .566), and (5) "Principals award the excellent teachers or students based on the proper evidence of data being collected" (Mean = 4.33, S.D. = .620). The item that has the lowest mean value is

“Principals analyze the school data first before he or she decides to develop any areas of the school” (Mean = 4.24, S.D. = .579).

The results of analysis of the level of the Sharing Leadership component of principals’ instructional leadership of NGSs.

Table 14: Mean, Standard Deviation, and Level of Sharing Leadership.

No.	Sharing Leadership	\bar{X}	S.D.	Level
1	Principals respect and encourage teachers to participate in decision making.	4.15	.667	High
2	Principals support and provide meaningful opportunities for teachers to become leaders.	4.41	.644	High
3	Principals show exemplary leadership to teachers.	4.34	.593	High
4	Principals build a school environment that supports teacher leadership.	4.39	.523	High
Total		4.41	.390	High

Table 14 indicates that the level of Sharing Leadership component of principals’ instructional leadership of NGSs is at high level (Mean = 4.41, S.D. = .390). When considering on each item, it showed that the item that has highest mean value among other is (2) “Principals support and provide meaningful opportunities for teachers to become leaders” (Mean = 4.41, S.D. = .644) followed by (4) “Principals build a school environment that supports teacher leadership” (Mean = 4.39, S.D. = .523), and (3) “Principals show exemplary leadership to teachers” (Mean = 4.34, S.D. = .593). The item that has the lowest mean value is (1) “Principals respect and encourage teachers to participate in decision making” (Mean = 4.15, S.D. = .667).

3. The Level of Teachers’ 21st Century Teaching Competencies in NGSs

Section 3: The results of analysis of the overall level of teachers’ 21st century teaching competencies as perceived by teachers in NGSs and the level of its each

component which consisted of 8 components such as 1) Exercising Teacher Leadership, 2) Comprehending Subject Contents, 3) Teaching Pedagogy, 4) Establishing a Positive Learning Environment, 5) Engaging with Parents and Community, 6) Inspiring Students in Learning, 7) Digital Competencies and 8) Reflecting Professional Practice

3.1 The overall level of teachers' 21st century teaching competencies in NGSs

The results of analysis of the overall level of teachers' 21st century teaching competencies in NGSs.

Table 15: Mean, Standard Deviation, and Level of teachers' 21st century teaching competencies in NGSs.

No.	Teachers' 21 st Century Teaching Competencies	\bar{X}	S.D.	Level
1	Exercising Teacher Leadership	4.35	.423	High
2	Comprehending Subject Contents	4.34	.437	High
3	Teaching Pedagogy	4.38	.400	High
4	Establishing a Positive Learning Environment	4.30	.555	High
5	Engaging with Parents and Community	4.12	.704	High
6	Inspiring Students in Learning	4.41	.391	High
7	Digital Competencies	4.33	.453	High
8	Reflecting Professional Practice	4.42	.451	High
Total		4.33	.316	High

Table 15 shows that the overall level of teachers' 21st century teaching competencies in NGSs is high (Mean = 4.33, S.D. = .316). The component that has the highest mean values among other is Reflecting Professional Practice (Mean = 4.42, S.D. = .451), followed by Inspiring Students in Learning (Mean = 4.41, S.D. = .391), Teaching Pedagogy (Mean = 4.38, S.D. = .400), Exercising Teacher Leadership (Mean = 4.35, S.D. = .423), Comprehending Subject Contents (Mean = 4.34, S.D. = .437), Digital Competencies (Mean = 4.33, S.D. = .453), Establishing a Positive Learning Environment (Mean = 4.30, S.D. = .555), and Engaging with Parents and Community (Mean = 4.12, S.D. = .704).

3.2 The level of the eight components of teachers' 21st century teaching competencies in NGSs

The results of analysis of the level of the Exercising Teacher Leadership component of teachers' 21st century teaching competencies in NGSs.

Table 16: Mean, Standard Deviation, and Level of Exercising Teacher Leadership.

No.	Exercising Teacher Leadership	\bar{X}	S.D.	Level
1	I have demonstrated leadership by participating in school development activities with other school personnel.	4.38	.563	High
2	I lead the class effectively by setting clear teaching objectives.	4.37	.528	High
3	I know how to select, create, modify, and manage digital educational resources.	4.43	.556	High
4	I acknowledge educational policies and how they affect the instruction.	4.21	.531	High
Total		4.35	.423	High

Table 16 indicates that the level of Exercising Teacher Leadership component of teachers' 21st century teaching competencies in NGSs is high (Mean = 4.35, S.D. = .423). When considering on each item of Exercising Teacher Leadership component, the item that has highest mean value among others is (3) "I know how to select, create, modify, and manage digital educational resources" (Mean = 4.43, S.D. = .556) followed by (1) "I have demonstrated leadership by participating in school development activities with other school personnel" (Mean = 4.38, S.D. = .563) and (2) "I lead the class effectively by setting clear teaching objectives" (Mean = 4.37, S.D. = .528). The item that has lowest mean value is (4) "I acknowledge educational policies and how they affect the instruction" (Mean = 4.21, S.D. = .531).

The results of analysis of the level of the Comprehending Subject Contents component of teachers' 21st century teaching competencies in NGSs.

Table 17: Mean, Standard Deviation, and Level of Comprehending Subject Contents.

No.	Comprehending Subject Contents	\bar{X}	S.D.	Level
1	I understand about the philosophy and significant objective of the curriculum.	4.33	.574	High
2	I understand clearly about the subject contents that I will teach.	4.41	.536	High
3	I have designed each lesson by linking with new knowledge in todays' society.	4.21	.634	High
4	I constantly develop myself by participating in training sessions or by reading books, doing self-study related to the latest educational trends.	4.42	.612	High
Total		4.34	.437	High

Table 17 indicates that the level of Comprehending Subject Contents component of teachers' 21st century teaching competencies in NGSs is high (Mean = 4.34, S.D. = .437). When considering on each item of Comprehending Subject Contents component, the item that has highest mean value among others is (4) "I constantly develop myself by participating in training sessions or by reading books, doing self-study related to the latest educational trends" (Mean = 4.42, S.D. = .612) followed by (2) "I understand clearly about the subject contents that I will teach" (Mean = 4.41, S.D. = .536) and (1) "I understand about the philosophy and significant objective of the curriculum" (Mean = 4.33, S.D. = .574). The item that has lowest mean value is (3) "I have designed each lesson by linking with new knowledge in todays' society" (Mean = 4.21, S.D. = .634).

The results of analysis of the level of the Teaching Pedagogy component of teachers' 21st century teaching competencies in NGSs.

Table 18: Mean, Standard Deviation, and Level of Teaching Pedagogy.

No.	Teaching Pedagogy	\bar{X}	S.D.	Level
1	I use new teaching methods (such as IBL, PBL, Flipped Classroom, etc.) tailored to each lesson objective.	4.34	.578	High
2	I design lessons plan with precise learning objectives which best match with students' background.	4.43	.539	High
3	I develop a plan to evaluate students' assessment in order to find ways to motivate and support student better learning.	4.47	.568	High
4	I monitor students' progress by providing appropriate support, feedback, and encouragement to students.	4.29	.585	High
Total		4.38	.400	High

Table 18 shows that the level of Teaching Pedagogy component of teachers' 21st century teaching competencies in NGSs is high (Mean = 4.38, S.D. = .400). The item that has highest mean value among others is (3) "I develop a plan to evaluate students' assessment in order to find ways to motivate and support student for better learning" (Mean = 4.47, S.D. = .568) followed by (2) "I design lessons plan with precise learning objectives which best match with students' background" (Mean = 4.43, S.D. = .539) and (1) "I use new teaching methods (such as IBL, PBL, Flipped Classroom, etc.) tailored to each lesson objective" (Mean = 4.34, S.D. = .578). The item that has lowest mean value is (4) "I monitor students' progress by providing appropriate support, feedback, and encouragement to students" (Mean = 4.29, S.D. = .585).

The results of analysis of the level of the Establishing a Positive Learning Environment component of teachers' 21st century teaching competencies in NGSs.

Table 19: Mean, Standard Deviation, and Level of Establishing a Positive Learning Environment.

No.	Establishing a Positive Learning Environment	\bar{X}	S.D.	Level
1	I set up a clean, safe and inspiring learning environment for students to learn.	4.38	.563	High
2	I provide learning spaces that allow students to speak with confidence and learn to mutually respect each other.	4.53	.576	Highest
3	I organize learning activities both inside and outside of the classroom.	4.14	.909	High
4	I use instructional tools to help students learn.	4.17	.841	High
Total		4.30	.555	High

Table 19 indicates that the level of Establishing a Positive Learning Environment component of teachers' 21st century teaching competencies in NGSs is high (Mean = 4.30, S.D. = .555). When considering on each item of Establishing a Positive Learning Environment component, the item that has highest mean value among others is (2) "I provide learning spaces that allow students to speak with confidence and learn to mutually respect each other" (Mean = 4.53, S.D. = .576), while the other three items have high mean Level.

The results of analysis of the level of the Engaging with Parents and Community component of teachers' 21st century teaching competencies in NGSs.

Table 20: Mean, Standard Deviation, and Level of Engaging with Parents and Community.

No.	Engaging with Parents and Community	\bar{X}	S.D.	Level
1	I have built a good relationship with students' parents and community and all other stakeholders.	4.07	.893	High
2	I have organized learning activities using local resources, local wisdom and traditions.	3.85	1.115	High
3	I collaborate with students' parents or guardians by inviting them to participate in their children's learning activities at school.	4.14	.970	High
4	I value the diversity of culture in school.	4.42	.571	High
Total		4.12	.704	High

Table 20 indicates that the level of Engaging with Parents and Community component of teachers' 21st century teaching competencies in NGSs is high (Mean = 4.12, S.D. = .704). When considering on each item of Engaging with Parents and Community component, the item that has highest mean value among other is (4) "I value the diversity of culture in school" (Mean = 4.42, S.D. = .571) followed by (3) "I collaborate with students' parents or guardians by inviting them to participate in their children's learning activities at school" (Mean = 4.14, S.D. = .970) and (1) "I have built a good relationship with students' parents and community and all other stakeholders" (Mean = 4.07, S.D. = .893). The item that has lowest mean value is (2) "I have organized learning activities using local resources, local wisdom and traditions" (Mean = 3.85, S.D. = 1.115).

The results of analysis of the level of the Inspiring Students in Learning component of teachers' 21st century teaching competencies in NGSs.

Table 21: Mean, Standard Deviation, and Level of Inspiring Students in Learning.

No.	Inspiring Students in Learning	\bar{X}	S.D.	Level
1	I identify students' needs and background such as interest, problem, strength, and weakness in order to find ways to help them learn better.	4.35	.533	High
2	I observe the ways that students learn and support them with unique learning needs.	4.37	.578	High
3	I prepare interesting and easy-to-understand lessons for students.	4.49	.527	High
4	I design learning activities which enable students to use digital technology in their learning process.	4.43	.565	High
Total		4.41	.390	High

Table 21 indicates that the level of Inspiring Students in Learning component of teachers' 21st century teaching competencies in NGSs is high (Mean = 4.41, S.D. = .390). When considering on each item of Inspiring Students in Learning component, the item that has highest mean value among others is (3) "I prepare interesting and easy-to-understand lessons for students" (Mean = 4.49, S.D. = .527) followed by (4) "I design learning activities which enable students to use digital technology in their learning process" (Mean = 4.43, S.D. = .565) and (2) "I observe the ways that students learn and support them with unique learning needs" (Mean = 4.37, S.D. = .578). The item that has lowest mean value is (1) "I identify students' needs and background such as interest, problem, strength, and weakness in order to find ways to help them learn better" (Mean = 3.35, S.D. = .533).

The results of analysis of the level of the Digital Competencies component of teachers' 21st century teaching competencies in NGSs.

Table 22: Mean, Standard Deviation, and Level of Digital Competencies.

No.	Digital Competencies	\bar{X}	S.D.	Level
1	I have used technology in teaching and learning process.	4.36	.542	High
2	I use Simulation/Digital Game-Based Learning in teaching and learning process.	4.29	.623	High
3	I acknowledge cyber security.	4.30	.565	High
4	I explain students about the risk of cyber security.	4.39	.647	High
Total		4.33	.453	High

Table 22 indicates that the level of Digital Competencies component of teachers' 21st century teaching competencies in NGSs is high (Mean = 4.33, S.D. = .453). When considering on each items of Digital Competencies component, the item that has highest mean value among others is (4) "I explain students about the risk of cyber security" (Mean = 4.39, S.D. = .647) followed by (1) "I have used technology in teaching and learning process" (Mean = 4.36, S.D. = .542) and (3) "I acknowledge cyber security" (Mean = 4.30, S.D. = .565). The item that has lowest mean value among others is (2) "I use Simulation/Digital Game-Based Learning in teaching and learning process" (Mean = 4.29, S.D. = .623).

The results of analysis of the level of the Reflecting Professional Practice component of teachers' 21st century teaching competencies in NGSs.

Table 23: Mean, Standard Deviation, and Level of Reflecting Professional Practice.

No.	Reflecting Professional Practice	\bar{X}	S.D.	Level
1	I am well aware of my identity and professional ability.	4.35	.610	High
2	I reflect on my teaching on my own and with colleagues to find ways to improve teaching more effectively.	4.48	.544	High
3	I strive to fulfill my work.	4.43	.505	High
4	I set clear goals to improve my abilities.	4.45	.525	High
Total		4.43	.451	High

Table 23 indicates that the level of Reflecting Professional Practice component of teachers' 21st century teaching competencies in NGSs is high (Mean = 4.43, S.D. = .451). When considering on each item of Reflecting Professional Practice component, the item that has highest mean value among others is (2) "I reflect on my teaching on my own and with colleagues to find ways to improve teaching more effectively" (Mean = 4.48, S.D. = .544) followed by (4) "I set clear goals to improve my abilities" (Mean = 4.45, S.D. = .525) and (3) "I strive to fulfill my work" (Mean = 4.43, S.D. = .505). The item that has lowest mean value among others is (1) "I am well aware of my identity and professional ability" (Mean = 4.35, S.D. = .610).

4. The Predictors of Principals' Instructional Leadership Affecting Teachers' 21st Century Teaching Competencies in NGSs

Section 4: This section presents the results of analysis of the predictors of principals' instructional leadership affecting teachers' 21st century teaching competencies in NGSs by testing the differences of coefficients.

4.1 The predictors of principals' instructional leadership affecting the overall teachers' 21st century teaching competencies in NGSs

The results of the multiple regression analysis in order to explore the predictors of principals' instructional leadership affecting the overall teachers' 21st century teaching competence in NGSs is indicated in Table 24 as follows:

Table 24: The coefficients of the multiple regression analysis on principals' instructional leadership affecting the overall teachers' 21st century teaching competencies in NGSs.

Principals' Instructional Leadership	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	.828	.185	-	4.477	.000**
Developing and Sustaining School Vision (X ₁)	.115	.042	.132	2.762	.006**
Managing Curriculum and Instruction (X ₂)	.243	.040	.357	6.047	.000**
Promoting School Learning Environment (X ₃)	.083	.030	.151	2.809	.005**
Supervising Teaching and Learning Process (X ₄)	.122	.039	.179	3.111	.002**
Driving Data to Make Instructional Decision (X ₅)	.134	.055	.177	2.448	.015*
Sharing Leadership (X ₆)	.110	.041	.162	2.693	.008**
R = .823, R ² = .677, Adjusted R Square = .668, S.E.b = .18228, F = 75.327, P = 000					

Note: Statistically significant **P < .01, *P < .05 Dependent Variable (Y): teachers' 21st century teaching competencies

From Table 24, the 6 components of principals' instructional leadership have $R = .823$, $R^2 = .677$ or (67.7%), which describe the principals' instructional leadership affect the overall teachers' 21st century teaching competencies at 67.7%, while there are other variables, which have not yet been studied affect the overall teachers' 21st century teaching competencies in NGS at 32.30%.

There are 6 predictors of the principals' instructional leadership affecting the overall teachers' 21st century teaching competencies. Based on Beta coefficients, the best predictor is Managing Curriculum and Instruction (X_2) ($\beta = .357$, $P = .009$), followed by Supervising Teaching and Learning Process (X_4) ($\beta = .179$, $P = .002$), Driving Data to Make Instructional Decision (X_5) ($\beta = .177$, $P = .015$), Sharing Leadership (X_6) ($\beta = .162$, $P = .008$), Promoting School Learning Environment (X_3) ($\beta = .151$, $P = .005$) and Developing and Sustaining School Vision (X_1) ($\beta = .132$, $P = .000$).

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y} = .828 + .115(X_1)^{**} + .243(X_2)^{**} + .083(X_3)^{**} + .122(X_4)^{**} + .134(X_5)^{*} + .110(X_6)^{**}$$

Equation of standardized coefficients

$$\hat{Z}_y = .132(X_1)^{**} + .357(X_2)^{**} + .151(X_3)^{**} + .179(X_4)^{**} + .177(X_5)^{*} + .162(X_6)^{**}$$

4.2 The predictors of principals' instructional leadership affecting each component of teachers' 21st century teaching competencies in NGSs

The analysis results to explore the predictors of principals' instructional leadership affecting each component of teachers' 21st century teaching competencies are shown as follows:

The analysis result to explore the predictors of the principals' instructional leadership affecting the teachers' Exercising Teacher Leadership in NGSs was summarized in Table 25.

Table 25: The coefficients of the multiple regression analysis on principals' instructional leadership affecting the teachers' Exercising Teacher Leadership in NGSs.

Principals' Instructional Leadership	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	.368	.246	-	1.499	.135
Developing and Sustaining School Vision (X ₁)	.141	.055	.121	2.544	.012*
Managing Curriculum and Instruction (X ₂)	.051	.053	.056	.952	.342
Promoting School Learning Environment (X ₃)	-.064	.039	-.087	-1.628	.105
Supervising Teaching and Learning Process (X ₄)	.155	.052	.171	2.978	.003**
Driving Data to Make Instructional Decision (X ₅)	.579	.073	.572	7.963	.000**
Sharing Leadership (X ₆)	.048	.054	.053	.877	.381
R = .825, R ² = .680, Adjusted R Square = .672, S.E.b = .24222, F = 76.674, P = 000					

Note: Statistically significant **P < .01, *P < .05 Dependent Variable (Y₁): teachers' Exercising Teacher Leadership

From Table 25, the overall principals' instructional leadership have $R = .825$, $R^2 = .680$ or (68.00%), which describes that the principals' instructional leadership affect teachers' Exercising Teacher Leadership (Y_1) at 68.00%, while there are other variables that have not yet been studied affect teachers' Exercising Teacher Leadership (Y_1) at 32%.

There are 3 predictors of the principals' instructional leadership affecting teachers' Exercising Teacher Leadership (Y_1). Based on Beta coefficients, the best predictor is, Driving Data to Make Instructional Decision (X_5) ($\beta = .572$, $P = .000$), followed by Supervising Teaching and Learning Process (X_4) ($\beta = .171$, $P = .003$), and Developing and Sustaining School Vision (X_1) ($\beta = .121$, $P = .012$).

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y}_1 = .368 + .141(X_1)^* + .051(X_2) - .064(X_3) + .155(X_4)^{**} + .579(X_5)^{**} + .048(X_6)$$

Equation of standardized coefficients

$$\hat{Z}_{Y_1} = .121(X_1)^* + .056(X_2) - .087(X_3) + .171(X_4)^{**} + .572(X_5)^{**} + .053(X_6)$$

The analysis result to explore the predictors of the principals' instructional leadership affecting the teachers' Comprehending Subject Contents in NGSs was summarized in Table 26.

Table 26: The coefficients of the multiple regression analysis on principals' instructional leadership affecting the teachers' Comprehending Subject Contents in NGSs.

Principals' Instructional Leadership	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	1.421	.249	-	5.708	.000**
Developing and Sustaining School Vision (X ₁)	-.136	.056	-.113	-2.429	.016*
Managing Curriculum and Instruction (X ₂)	.016	.054	.017	.294	.769
Promoting School Learning Environment (X ₃)	-.053	.040	-.069	-1.326	.186
Supervising Teaching and Learning Process (X ₄)	-.139	.053	-.148	-2.630	.009**
Driving Data to Make Instructional Decision (X ₅)	.477	.074	.456	6.481	.000**
Sharing Leadership (X ₆)	.509	.055	.545	9.280	.000**
R = .833, R ² = .694, Adjusted R Square = .686, S.E. _b = .24526, F = 81.688, P = 000					

Note: Statistically significant **P < .01, *P < .05 Dependent Variable (Y₂): teachers' Comprehending Subject Contents

From Table 26, the overall principals' instructional leadership have $R = .833$, $R^2 = .694$ or (69.40%), which describe the principals' instructional leadership affect teachers' Comprehending Subject Contents (Y_2) at 69.40%, while there are other variables that have not yet been studied affect teachers' Comprehending Subject Contents (Y_2) at 30.60%.

There are 4 predictors of the principals' instructional leadership affecting teachers' Comprehending Subject Contents (Y_2). Based on Beta coefficients, the best predictor is, Sharing Leadership (X_6) ($\beta = .545, P = .000$) followed by Driving Data to Make Instructional Decision (X_5) ($\beta = .556, P = .000$), which affect teachers' Comprehending Subject Contents (Y_2) positively. Meanwhile, the Developing and Sustaining School Vision (X_1) ($\beta = -.113, P = .016$) and Supervising Teaching and Learning Process (X_4) ($\beta = -.148, P = .009$) affect teachers' Comprehending Subject Contents (Y_2) negatively.

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y}_2 = 1.421 - .136(X_1)^* + .016(X_2) - .053(X_3) - .139(X_4)** + .477(X_5)** + .509(X_6)**$$

Equation of standardized coefficients

$$\hat{Z}_{Y_2} = -.113(X_1)^* + .017(X_2) - .069(X_3) - .148(X_4)** + .456(X_5)** + .545(X_6)**$$

The analysis result to explore the predictors of the principals' instructional leadership affecting the teachers' Teaching Pedagogy in NGSs was summarized in Table 27.

Table 27: The coefficients of the multiple regression analysis on principals' instructional leadership affecting the teachers' Teaching Pedagogy in NGSs.

Principals' Instructional Leadership	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	1.089	.264	-	4.123	.000**
Developing and Sustaining School Vision (X ₁)	.186	.060	.169	3.129	.002**
Managing Curriculum and Instruction (X ₂)	.640	.057	.742	11.167	.000**
Promoting School Learning Environment (X ₃)	-.253	.042	-.362	-5.980	.000**
Supervising Teaching and Learning Process (X ₄)	.034	.056	.039	.605	.546
Driving Data to Make Instructional Decision (X ₅)	-.159	.078	-.166	-2.033	.043*
Sharing Leadership (X ₆)	.300	.058	.351	5.157	.000**
R = .767, R² = .589, Adjusted R Square = .578, S.E._b = .26024, F = 51.603, P = 000					

Note: Statistically significant **P < .01, *P < .05 Dependent Variable (Y₃): teachers' Teaching Pedagogy

From Table 27, the overall principals' instructional leadership have $R = .767$, $R^2 = .589$ or (58.90%), which describe the principals' instructional leadership affect teachers' Teaching Pedagogy (Y_3) at 58.90%, while there are other variables that have not yet been studied affect teachers' Teaching Pedagogy (Y_3) at 41.10%.

There are 5 predictors of the principals' instructional leadership affecting teachers' Teaching Pedagogy (Y_3). Based on Beta coefficients, the best predictor is, Managing Curriculum and Instruction (X_2) ($\beta = .742$, $P = .000$) followed by Sharing Leadership (X_6) ($\beta = .351$, $P = .000$) and Developing and Sustaining School Vision (X_1) ($\beta = .169$, $P = .002$), which affect teachers' Teaching Pedagogy (Y_3) positively. Meanwhile, Driving Data to Make Instructional Decision (X_5) ($\beta = -.166$, $P = .043$) and Promoting School Learning Environment (X_3) ($\beta = -.362$, $P = .000$) affect teachers' Teaching Pedagogy (Y_3) negatively.

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y}_3 = 1.089 + .186(X_1)^{**} + .640(X_2)^{**} - .253(X_3)^{**} + .034(X_4) - .159(X_5)^* + .300(X_6)^{**}$$

Equation of standardized coefficients

$$\hat{Z}_{Y_3} = .169(X_1)^{**} + .742(X_2)^{**} - .362(X_3)^{**} + .039(X_4) - .166(X_5)^* + .351(X_6)^{**}$$

The analysis result to explore the predictors of the principals' instructional leadership affecting the teachers' Establishing a Positive Learning Environment in NGSs was summarized in Table 28.

Table 28: The coefficients of the multiple regression analysis on principals' instructional leadership affecting the teachers' Establishing a Positive Learning Environment in NGSs.

Principals' Instructional Leadership	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	.359	.265	-	1.357	.176
Developing and Sustaining School Vision (X ₁)	-.130	.060	-.085	-2.184	.030*
Managing Curriculum and Instruction (X ₂)	.728	.057	.609	12.683	.000**
Promoting School Learning Environment (X ₃)	.383	.042	.396	9.050	.000**
Supervising Teaching and Learning Process (X ₄)	-.133	.056	-.111	-2.371	.019*
Driving Data to Make Instructional Decision (X ₅)	.090	.078	.068	1.156	.249
Sharing Leadership (X ₆)	-.019	.058	-.016	-.335	.738
R = .886, R ² = .785, Adjusted R Square = .779, S.E.b = .26068, F = 131.644, P = 000					

Note: Statistically significant **P < .01, *P < .05 Dependent Variable (Y₄): teachers' Establishing a Positive Learning Environment

From Table 28, the overall principals' instructional leadership have $R = .886$, $R^2 = .785$ or (78.50%), which describe the principals' instructional leadership affect teachers' Establishing a Positive Learning Environment (Y_4) at 78.50%, while there are other variables which have not yet been studied affect the teachers' Establishing a Positive Learning Environment (Y_4) at 21.50%.

There are 4 predictors of the principals' instructional leadership affecting teachers' Establishing a Positive Learning Environment (Y_4). Based on Beta coefficients, the best predictor is, Managing Curriculum and Instruction (X_2) ($\beta = .609, P = .000$), followed by Promoting School Learning Environment (X_3) ($\beta = .396, P = .000$), which affect teachers' Establishing a Positive Learning Environment (Y_4) positively. Meanwhile, the Developing and Sustaining School Vision (X_1) ($\beta = -.085, P = .030$) and Supervising Teaching and Learning Process (X_4) ($\beta = -.111, P = .019$) affect teachers' Establishing a Positive Learning Environment (Y_4) negatively.

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y}_4 = .359 - .130(X_1)^* + .728(X_2)^{**} + .383(X_3)^{**} - .133(X_4)^* + .090(X_5) - .019(X_6)$$

Equation of standardized coefficients

$$\hat{Z}_{Y_4} = -.085(X_1)^* + .609(X_2)^{**} + .396(X_3)^{**} - .111(X_4)^* + .068(X_5) - .016(X_6)$$

The analysis result to explore the predictors of the principals' instructional leadership affecting the teachers' Engaging with Parents and Community in NGSs was summarized in Table 29.

Table 29: The coefficients of the multiple regression analysis on principals' instructional leadership affecting the teachers' Engaging with Parents and Community in NGSs.

Principals' Instructional leadership	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	-.140	.349	-	-.402	.688
Developing and Sustaining School Vision (X ₁)	-.128	.079	-.066	-1.625	.106
Managing Curriculum and Instruction (X ₂)	.212	.076	.140	2.798	.006**
Promoting School Learning Environment (X ₃)	.927	.056	.756	16.614	.000**
Supervising Teaching and Learning Process (X ₄)	.207	.074	.137	2.801	.006**
Driving Data to Make Instructional Decision (X ₅)	-.330	.103	-.196	-3.204	.002**
Sharing Leadership (X ₆)	.123	.077	.082	1.598	.111
R = .876, R ² = .768, Adjusted R Square = .761, S.E.b = .34381, F = 119.075, P = 000					

Note: Statistically significant **P < .01, *P < .05 Dependent Variable (Y₅): teachers' Engaging with Parents and Community

From Table 29, the overall principals' instructional leadership have $R = .876$, $R^2 = .768$ or (76.80%), which describe the principals' instructional leadership affect teachers' Engaging with Parents and Community (Y_5) at 76.80%, while there are other variables that have not yet been studied affect teachers' Engaging with Parents and Community (Y_5) at 23.20%.

There are 4 predictors of the principals' instructional leadership affecting teachers' Engaging with Parents and Community (Y_5). Based on Beta coefficients, the best predictor is Promoting School Learning Environment (X_3) ($\beta = .756, P = .000$), followed by Managing Curriculum and Instruction (X_2) ($\beta = .140, P = .006$) and Supervising Teaching and Learning Process (X_4) ($\beta = .137, P = .006$), which affect teachers' Engaging with Parents and Community (Y_5) positively. Meanwhile, the Driving Data to Make Instructional Decision (X_5) $\beta = -.196, P = .002$ affect teachers' Engaging with Parents and Community (Y_5) negatively.

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y}_5 = -.140 - .128(X_1) + .212(X_2) + .927(X_3)^{**} + .207(X_4)^{**} - .330(X_5)^{**} + .123(X_6)$$

Equation of standardized coefficients

$$\hat{Z}_{Y_5} = -.066(X_1) + .140(X_2) + .756(X_3)^{**} + .137(X_4)^{**} - .196(X_5)^{**} + .082(X_6)$$

The analysis result to explore the predictors of the principals' instructional leadership affecting the teachers' Inspiring Students in Learning in NGSs was summarized in Table 30.

Table 30: The coefficients of the multiple regression analysis on principals' instructional leadership affecting the teachers' Inspiring Students in Learning in NGSs.

Principals' Instructional Leadership	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	1.747	.296	-	5.894	.000**
Developing and Sustaining School Vision (X ₁)	.600	.067	.557	8.981	.000**
Managing Curriculum and Instruction (X ₂)	-.066	.064	-.078	-1.027	.306
Promoting School Learning Environment (X ₃)	.126	.047	.184	2.650	.009**
Supervising Teaching and Learning Process (X ₄)	.180	.063	.214	2.863	.005**
Driving Data to Make Instructional Decision (X ₅)	.032	.088	.034	.369	.713
Sharing Leadership (X ₆)	-.271	.065	-.325	-4.157	.000**
R = .676, R ² = .457, Adjusted R Square = .442, S.E.b = .29204, F = 30.286, P = 000					

Note: Statistically significant **P < .01, *P < .05 Dependent Variable (Y₀): teachers' Inspiring Students in Learning

From Table 30, the overall principals' instructional leadership have $R = .676$, $R^2 = .457$ or (45.70%), which describe the principals' instructional leadership affect teachers' Inspiring Students in Learning (Y_6) at 45.70%, while there are other variables that has not yet been studied affects teachers' Inspiring Students in Learning (Y_6) at 54.30%.

There are 4 predictors of the principals' instructional leadership affecting teachers' Inspiring Students in Learning (Y_6). Based on Beta coefficients, the best predictor is Developing and Sustaining School Vision (X_1) ($\beta = .557, P = .000$), followed by Supervising Teaching and Learning Process (X_4) ($\beta = .214, P = .005$) and Promoting School Learning Environment (X_3) ($\beta = .184, P = .009$), which affect teachers' Inspiring Students in Learning (Y_6) positively. Meanwhile, Sharing Leadership (X_6) $\beta = -.325, P = .000$ affect teachers' Inspiring Students in Learning (Y_6) negatively.

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y}_6 = 1.747 + .600(X_1)^{**} - .066(X_2) + .126(X_3)^{**} + .180(X_4)^{**} + .032(X_5) - .271(X_6)^{**}$$

Equation of standardized coefficients

$$\hat{Y}_{Y_6} = .557(X_1)^{**} - .078(X_2) + .184(X_3)^{**} + .214(X_4)^{**} + .034(X_5) - .325(X_6)^{**}$$

The analysis result to explore the predictors of the principals' instructional leadership affecting the teachers' Digital Competencies in NGSs was summarized in Table 31.

Table 31: The coefficients of the multiple regression analysis on principals' instructional leadership affecting the teachers' Digital Competencies in NGSs.

Principals' Instructional Leadership	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	.553	.264	-	2.092	.038*
Developing and Sustaining School Vision (X ₁)	.165	.060	.132	2.770	.006**
Managing Curriculum and Instruction (X ₂)	.209	.057	.214	3.642	.000**
Promoting School Learning Environment (X ₃)	-.176	.042	-.223	-4.166	.000**
Supervising Teaching and Learning Process (X ₄)	.598	.056	.614	10.685	.000**
Driving Data to Make Instructional Decision (X ₅)	.042	.078	.039	.542	.588
Sharing Leadership (X ₆)	.028	.058	.029	.481	.631
R = .824, R ² = .679, Adjusted R Square = .670, S.E. _b = .26047, F = 76.049, P = 000					

Note: Statistically significant **P < .01, *P < .05 Dependent Variable (Y₇): teachers' Digital Competencies

From Table 31, the overall principals' instructional leadership have $R = .824$, $R^2 = .679$ or (67.90%), which describe the principals' instructional leadership affect teachers' Digital Competencies (Y_7) at 67.90%, while there are other variables which have not yet been studied affects teachers' Digital Competencies (Y_7) at 32.10%.

There are 4 predictors of the principals' instructional leadership affecting teachers' Digital Competencies (Y_7). Based on Beta coefficients, the best predictor is Supervising Teaching and Learning Process (X_4) ($\beta = .614$, $P = .000$), followed by Managing Curriculum and Instruction (X_2) ($\beta = .214$, $P = .000$) and Developing and Sustaining School Vision (X_1) ($\beta = .132$, $P = .006$), which affect teachers' Digital Competencies (Y_7) positively. Meanwhile, Promoting School Learning Environment (X_3) $\beta = -.223$, $P = .000$ affect teachers' Digital Competencies (Y_7) negatively.

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y}_7 = .553 + .165(X_1)^{**} + .209(X_2)^{**} - .176(X_3)^{**} + .598(X_4)^{**} + .042(X_5) + .028(X_6)$$

Equation of standardized coefficients

$$\hat{Z}_{Y_7} = .132(X_1)^{**} + .214(X_2)^{**} - .223(X_3)^{**} + .614(X_4)^{**} + .039(X_5) + .029(X_6)$$

The analysis result to explore the predictors of the principals' instructional leadership affecting the teachers' Reflecting Professional Practice in NGSs was summarized in Table 32.

Table 32: The coefficients of the multiple regression analysis on principals' instructional leadership affecting the teachers' Reflecting Professional Practice in NGSs.

Principals' Instructional Leadership	Unstandardized Coefficients		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	1.229	.338	-	3.640	.000**
Developing and Sustaining School Vision (X ₁)	.224	.076	.180	2.938	.004**
Managing Curriculum and Instruction (X ₂)	.152	.073	.157	2.079	.039*
Promoting School Learning Environment (X ₃)	-.225	.054	-.286	-4.170	.000**
Supervising Teaching and Learning Process (X ₄)	.073	.072	.075	1.018	.310
Driving Data to Make Instructional Decision (X ₅)	.340	.100	.314	3.404	.001**
Sharing Leadership (X ₆)	.162	.074	.168	2.174	.031*
R = .687, R ² = .472, Adjusted R Square = .457, S.E. _b = .33260, F = 32.139, P = 000					

Note: Statistically significant **P < .01, *P < .05 Dependent Variable (Y₈): teachers' Reflecting Professional Practice

From Table 32, the overall principals' instructional leadership have $R = .687$, $R^2 = .472$ or (47.20%), which describe the principals' instructional leadership affect teachers' Reflecting Professional Practice (Y_8) at 47.20%, while there are other variables that have not yet been studied affect teachers' Reflecting Professional Practice (Y_8) at 47.20%.

There are 5 predictors of the principals' instructional leadership affecting teachers' Reflecting Professional Practice (Y_8). Based on Beta coefficients, the best predictor is Driving Data to Make Instructional Decision (X_5) ($\beta = .314, P = .001$), followed by Developing and Sustaining School Vision (X_1) ($\beta = .180, P = .004$), Sharing Leadership (X_6) ($\beta = .168, P = .031$), and Managing Curriculum and Instruction (X_2) ($\beta = .157, P = .039$), which affect teachers' Reflecting Professional Practice (Y_8) positively. Meanwhile, Promoting School Learning Environment (X_3) ($\beta = -.286, P = .000$) affect teachers' Reflecting Professional Practice (Y_8) negatively.

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y}_8 = 1.229 + .224(X_1)^{**} + .152(X_2)^* - .225(X_3)^{**} + .073(X_4) + .340(X_5)^{**} + .162(X_6)^*$$

Equation of standardized coefficients

$$\hat{Z}_{Y_8} = .180(X_1)^{**} + .157(X_2)^* - .286(X_3)^{**} + .075(X_4) + .314(X_5)^{**} + .168(X_6)^*$$

4.3 The comparison of regression analysis equations between the overall teachers' 21st century teaching competencies and its components

The results of the comparison of regression analysis equations between the overall teachers' 21st century teaching competencies and its components which was summarized in the Table 33 as follows:

Table 33: The comparison of regression analysis equations between the overall teachers' 21st century teaching competencies (Y) and its components (Y₁-Y₈).

21 st CTC (Y)	PIL (X)						R ²
	Standardized Coefficients						
	Beta						
	DSSV (X ₁)	MCI (X ₂)	PSLE (X ₃)	STLP (X ₄)	DDMID (X ₅)	SL (X ₆)	
ETL (Y ₁)	(.121)*	(.056)	(-.087)	(.171)**	(.572)**	(.053)	.680
CSC (Y ₂)	(-.113)*	(.017)	(-.069)	(-.148)**	(.456)**	(.545)**	.694
TP (Y ₃)	(.169)**	(.742)**	(-.362)**	(.039)	(-.166)*	(.351)**	.589
EPL (Y ₄)	(-.085)*	(.609)**	(.396)**	(-.111)*	(.068)	(-.016)	.785
EPC (Y ₅)	(-.066)	(.140)**	(.756)**	(.137)**	(-.196)**	(.082)	.768
ISL (Y ₆)	(.557)**	(-.078)	(.184)**	(.214)**	(.034)	(-.325)**	.457
DC (Y ₇)	(.132)**	(.214)**	(-.223)**	(.614)**	(.039)	(.029)	.679
RPP (Y ₈)	(.180)**	(.157)*	(-.286)**	(.075)	(.314)**	(.168)*	.472
21 st CTC (Y)	(.132)**	(.357)**	(.151)**	(.179)**	(.177)*	(.162)**	.677

Statistically significant **P < .01, *P < .05

PIL (X) = Principals Instructional Leadership

DSSV (X₁) = Developing and Sustaining Schools Vision

MCI (X₂) = Managing Curriculum and Instruction

PSLE (X₃) = Promoting School Learning Environment

STLP (X₄) = Supervising Teaching and Learning Process

DDMID (X₅) = Driving Data to Make Instructional Decision

SL (X₆) = Sharing Leadership

21st CTC (Y) = 21st century teaching competencies

ETL (Y₁) = Exercising Teacher Leadership

CSC (Y₂) = Comprehending Subject Contents

TP (Y₃) = Teaching Pedagogy

EPL (Y₄) = Establishing a Positive Learning Environment

EPC (Y₅) = Engaging with Parent and Community

ISL (Y₆) = Inspiring Students in Learning

DC (Y₇) = Digital Competencies

From Table 33, the researcher considered to select the best predictors based on the effect on the teachers' overall teaching competence (Beta value) and the most number of the positive effects on each teaching competencies. Here, the predictors are ranked starting from the best to the worse predictors as follows:

1) Managing Curriculum and Instruction (X₂)

When looking deeply on the Beta value of Managing Curriculum and Instruction (X₂) component of Principals' Instructional Leadership, it is considered as the best predictor since it has the strongest effect on the overall teacher competence, and it affects five components of Teachers' 21st Century Teaching Competencies positively, including Teaching Pedagogy (Y₃) ($\beta = .742, P < .01$), Establishing a Positive Learning Environment (Y₄) ($\beta = .609, P < .01$), Digital Competencies (Y₇) ($\beta = .214, P < .01$), Reflecting Professional Practice (Y₈) ($\beta = .157, P < .05$), and Engaging with Parents and Community (Y₅) ($\beta = .140, P < .01$).

2) Driving Data to Make Instructional Decisions (X₅)

Driving Data to Make Instructional Decision (X₅) component of Principals' Instructional Leadership is considered as the second best predictor since it is the second best of effect on the overall teacher competence, and it affects three major components of Teachers' 21st Century Teaching Competencies positively, including Exercising Teacher Leadership (Y₁) ($\beta = .572, P < .01$), Comprehending Subject Contents (Y₂) ($\beta = .456, P < .01$), and Reflecting Professional Practice (Y₈) ($\beta = .314, P < .01$), while it affects two components of Teachers' 21st Century Teaching Competencies negatively, including Engaging with Parents and Community (Y₅) ($\beta = -.196, P < .01$) and Teaching Pedagogy (Y₃) ($\beta = -.166, P < .05$).

3) Sharing Leadership (X₆)

Sharing Leadership (X₆) component of Principals' Instructional Leadership is considered as the third best predictor since it is also the second best of effect on the overall teacher competence, and it affects three major components of Teachers' 21st Century Teaching Competencies positively, including Comprehending Subject Contents (Y₂) ($\beta = .545, P < .01$), Teaching Pedagogy (Y₃) ($\beta = .351, P < .01$), and Reflecting Professional Practice (Y₈) ($\beta = .168, P < .05$), while it affects

one component of Teachers' 21st Century Teaching Competencies negatively which is Inspiring Students in Learning (Y_6) ($\beta = -.325, P < .01$).

4) Supervising Teaching and Learning Process (X_4)

Supervising Teaching and Learning Process (X_4) component of Principals' Instructional Leadership is considered as the fourth predictor. Although it is another second best of effect on the overall teacher competence, it affects minor components of Teachers' 21st Century Teaching Competencies positively, including Digital Competencies (Y_7) ($\beta = .614, P < .01$), Inspiring Students in Learning (Y_6) ($\beta = .214, P < .01$), Exercising Teacher Leadership (Y_1) ($\beta = .171, P < .01$) and Engaging with Parents and Community (Y_5) ($\beta = .137, P < .01$), while it affects two components of Teachers' 21st Century Teaching Competencies negatively, including Comprehending Subject Contents (Y_2) ($\beta = -.148, P < .01$) and Establishing a Positive Learning Environment (Y_4) ($\beta = -.111, P < .05$).

5) Developing and Sustaining School Vision (X_1)

Developing and Sustaining School Vision (X_1) component of Principals' Instructional Leadership is considered as the fifth predictor since it has weak effect on the overall teacher competence, and it affects minor components of Teachers' 21st Century Teaching Competencies positively, including Inspiring Students in Learning (Y_6) ($\beta = .557, P < .01$), Reflecting Professional Practice (Y_8) ($\beta = .180, P < .01$), Teaching Pedagogy (Y_3) ($\beta = .169, P < .01$), Digital Competencies (Y_7) ($\beta = .132, P < .01$), and Exercising Teacher Leadership (Y_1) ($\beta = .121, P < .05$), while it affects two components of Teachers' 21st Century Teaching Competencies negatively, including Comprehending Subject Contents (Y_2) ($\beta = -.113, P < .05$) and Establishing a Positive Learning Environment (Y_4) ($\beta = -.085, P < .05$).

6) Promoting School Learning Environment (X_3)

Meanwhile, Promoting School Learning Environment (X_3) component of Principals' Instructional Leadership is considered as the worst predictor since it has the weakest effect on the overall teacher competence, and it affects minor components of Teachers' 21st Century Teaching Competencies positively, including Engaging with Parents and Community (Y_5) ($\beta = .756, P < .01$), Establishing a Positive Learning Environment (Y_4) ($\beta = .396, P < .01$) and Inspiring Student in Learning (Y_6) ($\beta =$

.184, $P < .01$), while it affects three components of Teachers' 21st Century Teaching Competencies negatively, including Teaching Pedagogy (Y_3) ($\beta = -.362, P < .01$), Reflecting Professional Practice (Y_8) ($\beta = -.286, P < .01$) and Digital Competencies (Y_7) ($\beta = -.223, P < .01$).

CHAPTER 5

SUMMARY OF RESEARCH FINDINGS, DISCUSSION, AND RECOMMENDATIONS

This chapter presents the summary of the research findings, discussion and recommendations of the study “The Effect of Principals’ Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in New Generation Schools in Cambodia.”

The objectives of this study are 1) To study the level of principals’ instructional leadership of New Generation Schools, 2) To investigate the level of teachers’ 21st century teaching competencies in New Generation Schools, and 3) To examine the predictors of principals’ instructional leadership affecting teachers’ 21st century teaching competencies in New Generation Schools.

The research population of this study included 502 teachers from 10 New Generation Schools which are public primary schools and secondary schools under the jurisdiction of Ministry of Education, Youth and Sport (MoEYS) in Cambodia. The sample population consisted of 223 teachers of New Generation Schools.

The research instruments used for collecting data in this study are the 5-Point Likert Scale questionnaires. The data were analyzed by using Frequency, Percentage, Mean, Standard Deviation, and Enter multiple regression method.

The summary of research findings, discussion, and recommendation include in the sections as follows:

1. Summary of Research Findings

1.1 The demographic data of the informants

The results of the demographic data analysis of the questionnaires classified by the teacher informants' gender, educational qualification, teaching subjects and work experience found that 57% of teacher informants are male, 70.00% of them holding bachelor degree, 22.90% are teachers of primary school and 41.30% have work experience less than five years.

1.2 The level of principals' instructional leadership of NGSs

1.2.1 The overall level of principals' instructional leadership of NGSs

The findings of this current study found that the overall level of principals' Instructional leadership of NGSs is high (Mean = 4.34, S.D. = .313) while all of the six components also contain high level. The Developing and Sustaining School Vision component has the highest mean value (Mean = 4.46, S.D. = .363) when comparing to the other components. While, the Promoting School Environment component has the lowest mean value (Mean = 4.24, S.D. = .574).

1.2.2 The level of the six components of the principal's instruction leadership of NGSs

The level of the Developing and Sustaining School Vision component of principals' instructional leadership of NGSs in overall is high (Mean = 4.46, S.D. = .363). The finding revealed that the item (2) "Principals communicate vision, mission, values, common goals and strategic plans to create mutual understanding with stakeholders" contained the highest mean value (Mean = 4.52, S.D. = .544) while the other items have the high mean value.

The overall level of the Managing Curriculum and Instruction component of principals' instructional leadership of NGSs is high (Mean = 4.35, S.D. = .465). When considering on each item, the item (4) "Principals conduct research on the best teaching techniques to enhance successful teaching and learning" has highest mean value (Mean = 4.49, S.D. = .584) while the item (5) "Principals provide the necessary resources for teachers to serve teaching and learning" has the lowest mean value (Mean = 4.15, S.D. = .902).

The level of the Promoting School Environment component of principals' instructional leadership of NGSs in overall is high (Mean = 4.24, S.D. = .574). The item

(5) “Principals encourage teachers to analyze student learning outcomes to develop student’ performance” has the highest mean value among other component (Mean = 4.46, S.D. = .575) while the item (3) “Principals promote a harmonious culture in the workplace” has the lowest mean value (Mean = 3.92, S.D. = 1.114).

The level of the Supervising Teaching and Learning Process component of principals’ instructional leadership of NGSs in overall is high (Mean = 4.30, S.D. = .555). Among all of the items, the item (2) “Principals provide feedback to teachers in order to improve teaching methods” has the highest mean value (Mean = 4.36, S.D. = .606), while the item (1) “Principals make time to visit the classroom” has the lowest mean value (Mean = 4.17, S.D. = .762).

The level of the Driving Data to Make Instructional Decision component of principals’ instructional leadership of NGSs is high (Mean = 4.36, S.D. = .418). When considering on each item, the item (2) “Principals use the past data as baseline data to evaluate teachers’ performance” has the highest mean value (Mean = 4.48, S.D. = .568), while the item (3) “Principals analyze the school data first before he or she decides to develop any areas of the school” has the lowest mean value (Mean = 4.24, S.D. = .579).

The Sharing Leadership component of principals’ instructional leadership of NGSs, in overall, is high (Mean = 4.41, S.D. = .390). The item (2) “Principals support and provide meaningful opportunities for teachers to become leaders” has the highest mean value among others item (Mean = 4.41, S.D. = .644), while the item (1) “Principals respect and encourage teachers to participate in decision making” has the lowest mean value (Mean = 4.15, S.D. = .667).

1.3 The level of teachers’ 21st century teaching competencies in NGSs

1.3.1 The overall level of teachers’ 21st century teaching competencies in NGSs

The findings of this study indicated that the overall level of teachers’ 21st teaching competencies in NGSs is high (Mean = 4.33, S.D. = .316), while all of its eight components also contain the high level. When comparing to the other components, the Reflecting Professional Practice component has the highest mean value (Mean = 4.42, S.D. = .451). While, the Engaging with Parents and Community component has the lowest mean value (Mean = 4.12, S.D. = .704).

1.3.2 The level of the eight components of teachers' 21st century teaching competencies in NGSs

The overall level of the Exercising Teacher Leadership component of the teachers' 21st century teaching competencies in NGSs is high (Mean = 4.35, S.D. = .423). The item (3) "I know how to select, create, modify, and manage digital educational resources" has the highest mean value among other items (Mean = 4.43, S.D. = .556), while the item (4) "I acknowledge educational policies and how they affect the instruction" has the lowest mean value (Mean = 4.21, S.D. = .531).

The level of the Comprehending Subject Contents component of teachers' 21st century teaching competencies in NGSs, in overall, is high (Mean = 4.34, S.D. = .437). The item (4) "I constantly develop myself by participating in training sessions or by reading books, doing self-study related to the latest educational trends" has the highest mean value among other items (Mean = 4.42, S.D. = .612), while the item (3) "I have designed each lesson by linking with new knowledge in today's society" has the lowest mean value (Mean = 4.21, S.D. = .634).

The level of the Teaching Pedagogy component of teachers' 21st century teaching competencies in NGSs, in overall, is high (Mean = 4.38, S.D. = .400). The item (3) "I develop a plan to evaluate students' assessment in order to find ways to motivate and support student better learning" has the highest mean value among other items (Mean = 4.47, S.D. = .568), while the item (4) "I monitor students' progress by providing appropriate support, feedback, and encouragement to students" has the lowest mean value (Mean = 4.29, S.D. = .585).

The level of the Establishing a Positive Learning Environment component of teachers' 21st century teaching competencies in NGSs, in overall, is high (Mean = 4.30, S.D. = .555). When considering on each item, the item (2) "I provide learning spaces that allow students to speak with confidence and learn to mutually respect each other" has the highest mean value (Mean = 4.53, S.D. = .576), while the others items contain the high mean value.

The overall level of the Engaging with Parent and Community component of teachers' 21st century teaching competencies in NGSs, in overall, is high (Mean = 4.12, S.D. = .704). The item (4) "I value the diversity of culture in school" has the highest mean

value among other items (Mean = 4.42, S.D. = .571), while the item (1) “I have organized learning activities using local resources, local wisdom and traditions” has the lowest mean value (Mean = 4.07, S.D. = .893).

The overall level of the Inspiring Students in Learning component of the teachers’ 21st century teaching competencies in NGSs is high (Mean = 4.41, S.D. = .390). The item (3) “I prepare interesting and easy-to-understand lessons for students” has the highest mean value among other items (Mean = 4.49, S.D. = .527), while the item (1) “I identify students’ needs and background such as interest, problem, strength, and weakness in order to find ways to help them learn better” has the lowest mean value (Mean = 4.35, S.D. = .533).

The overall level of the Digital Competencies component of teachers’ 21st century teaching competencies in NGSs is high (Mean = 4.33, S.D. = .453). The item (4) “I explain students about the risk of cyber security” has the highest mean value among other items (Mean = 4.39, S.D. = .647), while the item (2) “I use Simulation/Digital Game-Based Learning in teaching and learning process” has the lowest mean value (Mean = 4.29, S.D. = .623).

The level of the Reflecting Professional Practice component of teachers’ 21st century teaching competencies in NGSs is high (Mean = 4.43, S.D. = .451). The item (2) “I reflect my teaching on my own and with colleagues to find ways to improve teaching more effectively” has the highest mean value among other items (Mean = 4.48, S.D. = .544) while the item (1) “I am well aware of my identity and professional ability” has the lowest mean value (Mean = 4.35, S.D. = .610).

1.4 The predictors of principals’ instructional leadership affecting teachers’ 21st century teaching competencies in NGSs

1.4.1 The predictor of the principals’ instructional leadership affecting the overall teachers’ 21st century teaching competencies in NGSs

The finding stipulated that the six components of principals’ instructional leadership of NGSs which consist of developing and sustaining school vision, managing curriculum and instruction, promoting school environment, supervising teaching and learning process, driving data to make instructional decision, and sharing leadership have $R = .823$, $R^2 = .677$ or (67.7%) which describe the principals’

instructional leadership affect the overall teachers' 21st century teaching competencies in NGSs at 67.70% while there are other variables which has not yet been studied affects the overall teachers' 21st century teaching competencies in NGSs at 32.30%.

Based on the Beta coefficients, the Managing Curriculum and Instruction component ($\beta = .357$, $P = .009$) is the best predictor followed by Supervising Teaching and Learning Process ($\beta = .179$, $P = .002$), Driving Data to Make Instructional Decision ($\beta = .177$, $P = .015$), Sharing Leadership ($\beta = .162$, $P = .008$), Promoting School Environment ($\beta = .151$, $P = .005$) and Developing and Sustaining School Vision ($\beta = .132$, $P = .000$).

The multiple linear regression equations that put these variables in are as follows:

Equation of unstandardized coefficients

$$\hat{Y} = .828 + .115(X_1)^{**} + .243(X_2)^{**} + .083(X_3)^{**} + .122(X_4)^{**} + .134(X_5)^* + .110(X_6)^{**}$$

Equation of standardized coefficients

$$\hat{Z}_Y = .132(X_1)^{**} + .357(X_2)^{**} + .151(X_3)^{**} + .179(X_4)^{**} + .177(X_5)^* + .162(X_6)^{**}$$

1.4.2 The predictors of principals' instructional leadership affecting each component of teachers' 21st century teaching competencies in NGSs

From the findings on page 128-131, the research found the best predictors in order as follows:

The best predictor is Managing Curriculum and Instruction component of Principals' Instructional Leadership since it affects positively five components, most major ones, of Teachers' 21st Century Teaching Competencies, including Teaching Pedagogy ($\beta = .742$, $P < .01$), Establishing a Positive Learning Environment ($\beta = .609$, $P < .01$), Digital Competencies ($\beta = .214$, $P < .01$), Reflecting Professional Practice ($\beta = .157$, $P < .05$), and Engaging with Parents and Community ($\beta = .140$, $P < .01$).

The second best predictor is Driving Data to Make Instructional Decision component of Principals' Instructional Leadership, and it affects major components of Teachers' 21st Century Teaching Competencies positively, including Exercising Teacher Leadership ($\beta = .572$, $P < .01$), Comprehending Subject Contents ($\beta = .456$, $P < .01$), and Reflecting Professional Practice ($\beta = .314$, $P < .01$), while it affects negatively two components of Teachers' 21st Century Teaching Competencies,

including Engaging with Parents and Community ($\beta = -.196, P < .01$) and Teaching Pedagogy ($\beta = -.166, P < .05$).

The third best predictor is Sharing Leadership component of Principals' Instructional Leadership since it affects major components of Teachers' 21st Century Teaching Competencies positively, including Comprehending Subject Contents ($\beta = .545, P < .01$), Teaching Pedagogy ($\beta = .351, P < .01$), and Reflecting Professional Practice ($\beta = .168, P < .05$), while it affects negatively one component of Teachers' 21st Century Teaching Competencies include Inspiring Students in Learning ($\beta = -.325, P < .01$).

Followed by the Supervising Teaching and Learning Process component of Principals' Instructional Leadership, which is the fourth predictor since it affects minor components of Teachers' 21st Century Teaching Competencies positively, including Digital Competencies ($\beta = .614, P < .01$), Inspiring Students in Learning ($\beta = .214, P < .01$), Exercising Teacher Leadership ($\beta = .171, P < .01$) and Engaging with parents and Community ($\beta = .137, P < .01$), while it affects negatively two components of 21st Century Teaching Competencies, including Comprehending Subject Contents ($\beta = -.148, P < .01$) and Establishing a Positive Learning Environment ($\beta = -.111, P < .05$).

The Developing and Sustaining School Vision component of Principals' Instructional Leadership is the fifth predictor since it affects positively minor components of Teachers' 21st Century Teaching Competencies, including Inspiring Students in Learning ($\beta = .557, P < .01$), Reflecting Professional Practice ($\beta = .180, P < .01$), Teaching Pedagogy ($\beta = .169, P < .01$), Digital Competencies ($\beta = .132, P < .01$), Exercising Teacher Leadership ($\beta = .121, P < .05$), while it affects negatively two components of Teachers' 21st Century Teaching Competencies, including Comprehending Subject Contents ($\beta = -.113, P < .05$) and Establishing a Positive Learning Environment ($\beta = -.085, P < .05$).

Last of all, the worst predictor is Promoting School Learning Environment component of Principals' Instructional Leadership since it affects positively minor components of Teachers' 21st Century Teaching Competencies, including Engaging with Parents and Community ($\beta = .756, P < .01$), Establishing a Positive Learning

Environment ($\beta = .396, P < .01$) and Inspiring Student in Learning ($\beta = .184, P < .01$), while it affects negatively three components of Teachers' 21st Century Teaching Competencies, including Teaching Pedagogy ($\beta = -.362, P < .01$), Reflecting Professional Practice ($\beta = -.286, P < .01$) and Digital Competencies ($\beta = -.223, P < .01$).

2. Discussion

The discussion of the research findings are based on the objectives of the research study as follows:

2.1 The discussion on the level of principals' instructional leadership of NGSs

The first objective of this study is to study the level of principals' instructional leadership of NGSs which consist of six components such as Developing and Sustaining School Vision, Managing Curriculum and Instruction, Promoting School Learning Environment, Supervising Teaching and Learning Process, Driving Data to Make Instructional Decision, and Sharing Leadership.

The findings revealed that the overall level of principals' instructional leadership of NGSs is high. It is similar to the study of Phaengbuppha, Choeybal and Ksurimon (2021) who studied on "The Instructional Leadership Development Guidelines for School Administrators under the Office of Udon Thani Primary Educational Service Area". Their findings showed that the instructional leadership of school administrators was at high level. It was also in accordance with the study of Ismail, Don, Husin and Kalid (2018), which aimed to examine the relationship between school leaders' instructional leadership and teachers' functional competency in high prestige schools in the Northern part of Peninsular Malaysia. The study found that the level of instructional leadership among the school leaders is high.

It has been viewed that the creation of schools where all students can realize their full potential and have the chance to flourish in society is a fundamental moral, ethical, and legal obligation for educators. Principals who serve as instructional leaders are crucial to achieving this goal (Smith and Andrews, 1989). The significant level of principals' instructional leadership of NGSs may result from NGSs are new innovation schools which require to add the efforts to develop the education system to be very high

quality. Hence, NGS principals are required to be at high professional standards. As Leithwood, Louis, Anderson and Wahlstrom (2004), and Spillane, Halverson and Diamond (2001) mentioned, high-quality instructional leaders have the objectives to improve the environment and culture of the school through strong leadership abilities and instructional best practices that encourage student learning. They further added that school principals who contain instructional leadership skills work to develop school vision and mission, facilitate curriculum and instruction, encourage professional development, modernize learning environment, enhance teaching supervision and assessment, and promote the intensive use of technology to drive innovation.

The findings discovered that the developing and sustaining school vision component of principals' instructional leadership has the highest mean value among the other components. According to the findings, it may result from New Generation Schools requiring high-performance standards at all level. It was mentioned that New Generation School will be withdrawn from NGS accreditation and investment in case it no longer meet the agreed criteria (MoEYS, 2016). As so, NGS principals might need to set clear school vision in order to ensure school development. It is in accordance with the study of Bendikson, Robinson and Hattie (2012), who mentioned that clear vision setting is believed to be one of the key aspects of effective schools that is most consistently present. It is essential to set a clear school vision and mission, which determine the direction of the school development to achieve goals in academic operations and work within the school. Effective principal instructional leadership will set the vision for school development (Hallinger and Murphy, 1987; Purkey and Smith, 1983).

The findings of this study further revealed that the level of principals' instructional leadership components, such as driving data to make instructional decisions, managing curriculum and instruction, sharing leadership, and supervising the teaching and learning process, are also high. According to the findings, this may result from New Generation schools, as innovative schools, require principals' high-performance standards. As so, NGS principals might need to enhance their leadership competence in order to keep up the NGS high standards. Knezevich (1984) mentioned that instructional leaders will establish strict guidelines that will produce a transparent

and accountable environment for the professional use of 21st century instruction and evaluation. Bacharach (1990) viewed the curricula requirement and supervision of instruction as the factors lead to school improvement. In addition, to encourage the school personnel active engagement and student participation in schools development, principals might require to promote leadership with school personnel. As stated by Huber (2004), sharing leadership in schools is generally considered as the behavior that exhibits deliberate patterns of commitment and reciprocal impact among principals and teachers. Ultimately, in the modern schooling, it is important for school principal to be knowledgeable about the best instructional and pedagogical practices and to use that knowledge to influence the establishment of collaborative structures within the school for the design of intensely engaging student work, ongoing peer review, and dissemination of that work within the professional community.

The results of this study also indicated that the promoting school learning environment component of principals' instructional leadership of NGSs is also high. However, when comparing to the other components, it has the lowest mean value. This may explain that NGSs may not have sufficient finances to manage their schooling to please their teachers. It aligns with the literature where Cambodian schools have experienced insufficient budget allocations for school operation (Ashida and Chea, 2017; MoEYS, 2016; SEAMEO-INNOTECH, 2012). According to Onderi and Makori (2013), school budget restrictions prevent principals from doing their duties in an efficient manner.

2.2 The discussion on the level of teachers' 21st century teaching competencies in NGSs

The second objective of this study is to investigate the level of teachers' 21st century teaching competencies in NGSs which consists of eight components, such as Exercising Teacher Leadership, Comprehending Subject Contents, Teaching Pedagogy, Establishing a Positive Learning Environment, Engaging with Parents and Community, Inspiring Students in Learning, Digital Competencies, and Reflecting Professional Practice.

The results indicated that the overall level teachers' 21st teaching competencies in NGSs is high. It was similar with the study of Cosanay and Karali (2022), which studied on

“Examination of classroom teachers’ 21st century teaching skills” of teachers working in Malatya Province Center districts in Turkey. This study found that the classroom teachers’ use of 21st century teacher skills was at high level. Furthermore, it is also similar to the study of Prachakul and Kulophas (2021), who studied on “A Study of 21st Century Teacher Competencies of Teachers in the Schools Under the Vibhavadi Joint Campus, the Secondary Education Service Area Office 2, Bangkok”. This study found that the teachers’ competencies is at high level.

The level of teachers’ 21st century teaching competencies in NGSs is high which may results from the reason that NGSs require the high quality of education for innovative schools, including the high quality of teachers. As demonstrated by the previous research, the teachers’ teaching competencies has a positive impact on the quality of teaching and learning (Robinson, 2011; Elliott, 2015). Students’ academic success is significantly impacted by teachers’ ability to incorporate comprehensive knowledge into their teaching methods. (Robinson, 2011). As stated in New Generation School policy that New Generation Schools are allowed to work outside of the policy framework applied to normal schools, including outside recruitment of teachers as long as schools could promote innovation and improve educational quality (MoEYS, 2019).

It has been seen that the highest level of teachers’ 21st century teaching competencies in NGSs belongs to reflecting professional practice. According to the finding, this may result from NGSs requiring high-quality competent teachers. As stated in New Generation School operational policy guidelines, one of the specific objectives for New Generation School is to improve teaching standards through new approaches that include (i) competitive teacher recruitment, (ii) performance-based incentives, (iii) intensive capacity-building in educational technology; (iv) STEM and problem-based learning methodologies; and (v) explicit teacher career paths linked to professional development opportunities (MoEYS, 2019). As so, teachers in NGSs might become more aware of their fundamental prejudices and presumptions regarding teaching competence. Teachers may need to become very self-reflective about their job to meet the requirement of New Generation Schools. Throughout the process of action-reflection, teachers can address the problems that might restrict the teaching and learning process, and to better understand how students perceive various teaching strategies (Lau et al., 2002).

The findings of this study also indicated the high level of teachers' 21st century teaching competencies in NGSs including, inspiring students in learning, teaching pedagogy, exercising teacher leadership, comprehending subject contents, and digital competencies. This may result from the same reason that NGSs are innovative schools which requires high teaching standard. NGS teachers are expected to fully utilize the new learning resources available (MoEYS, 2019), teachers might need to prepare multiplicity of teaching and learning strategies, including constructing a clear lesson plans, and allocating a variety of resources in instruction, in addition, fostering learning environments where students feel emotionally safe and joyful as well as recognized and supported (Miller and Pedro, 2006). As, it was mentioned that teachers in NGSs are required to have a laptop in order to improve educational services such as electronic lesson planning, the use of media for classroom presentations, internet research, and software-driven learning and assessment, among others (MoEYS, 2019). Green, Facer, Rudd, Dillon and Humphreys (2005) stated that innovative teaching and learning practices require the huge support from ICT. In contrast to traditional, paper-based techniques, the incorporation of ICT into daily school life may enable new teaching and learning.

The findings of this study also found that the level of engaging with parents and community component of teachers' 21st century teaching competencies in NGSs is also high. However, it remains the lowest level when compared to other components. According to the finding, this may result from New Generation School idea to prioritize the Kingdom's education system in increasing skill levels in the STEM subjects (i.e., Science, Technology, Engineering, and Mathematics), which acquire teachers to focus more on providing students with academic knowledge. With this regard, teachers might be granted less opportunity to engage with teacher-parent communication and collaboration, also less priority given for teachers to organize learning activities using community reassures (i.e., athletics, sports meets, musical performances, local cultural events...etc.). Blank, Melaville and Shah (2003) mentioned that creating chances to use community assets and link educational and extracurricular activities has the potential to further improve schools. They further added that the community schools concept has boosted family participation, raised student success, and brought together wraparound

services and a variety of artistic, musical, academic, cultural, and other programming for kids and parents within and outside of the school day. Also, a large body of research suggested that family and community involvement is an essential resource for individual student accomplishment as well as for launching and maintaining school improvement and creating school environments (Henderson and Mapp 2002; Sebring et al., 2006; Henderson et al., 2007).

2.3 The discussion on the predictors of principals' instructional leadership affecting teachers' 21st century teaching competencies in NGSs

The third objective of this study was to examine the predictors of principals' instructional leadership affecting teachers' 21st century teaching in NGSs.

The findings stipulated that the principals' instructional leadership affect positively and significantly on teachers' 21st century teaching competencies with a statistical significance of .01. It was supported by the study of Ismail, Husin, and Khalid (2018), which looked at the relationship between teachers' functional competency and the leaders' instructional leadership at a prestigious school in Peninsular Malaysia's northern region. In their study, they found that the leaders' instructional leadership had a significant association with teachers' functional competencies, including knowledge and skills. Though the results indicated that the leaders' instructional leadership had a weak positive and significant relationship with teachers' skills, it had an average strong positive and significant relationship with teachers' knowledge. He suggested that the instructional leadership practice of leaders impacts teachers' functional competencies. It was also in line with the study of Ismail, Mansor, Iksan and Nor (2018), which aimed to investigate the influence of instructional leadership on science teaching competencies, including knowledge and understanding, teaching and learning skills, and teachers' professional development practices. Their study found that instructional leadership had a positive impact on science teaching competencies. They then suggested that instructional leadership can improve science teaching competencies.

The results of this study discovered that the six components of principals' instructional leadership are the predictors which affect teachers' 21st century teaching competencies positively and significantly. The best predictor is Managing Curriculum and Instruction, followed by Driving Data to Make Instructional Decision, Sharing

Leadership, Supervising Teaching and Learning Process, Developing and Sustaining School Vision, and Promoting School Learning Environment.

Each of the predictor was discussed orderly from the best predictor to the worst predictor:

1) Managing Curriculum and Instruction

The findings revealed that the Managing Curriculum and Instruction (X₂) component of principals' instructional leadership of NGSs has an overall positive and significant impact on teachers' 21st century teaching competencies in NGSs. According to the results, it has been identified that principals focus on managing curriculum and instruction activities improve teachers' 21st century teaching competencies, such as *teaching pedagogy, establishing a positive learning environment, digital competencies, reflecting professional practice, and engaging with parents and community.*

It has been viewed that if NGSs can demonstrate how suggested changes will foster innovation and improve educational quality, they will be permitted to operate beyond the legal restrictions imposed on normal schools. The freedom includes modifications in the curriculum (MoEYS, 2019). Popkewitz (2004) mentioned that curriculum and instruction are where the school's mission is most visibly put into practice. In public schools, the principal is a key player in coordinating curricular change. Mutale (2018) stated that curriculum relates to all of the selected, planned, inventive, integrative, and evaluative educational experiences offered to students either involuntarily or actively while they are under the instruction of the school in order to meet the established learning objectives. Virgilio and Virgilio (1984) addressed that in order to provide teachers the chance to successfully implement the curriculum, principals need to organize a comprehensive staff development program and communicate freely with the school personnel to announce all methods needed in curriculum implementation. The principal should also inspire and support their teachers on a regular basis in order to promote interest and enthusiasm in the new curriculum.

The results of this study discovered that the principals work on managing curriculum and instruction impact the teaching pedagogy competencies of teachers in NGSs. The finding supported by the studies of Cuban (1984) and Hallinger and Murphy (1986), who mentioned that instructional principals focus on curriculum and instruction

work with teachers to improve teaching and learning. It is in accordance with the research of King (2002), who indicated that curriculum leaders provided purposeful and inspiring support to teachers in their instructional practices concerning pedagogy, coursework, and teaching aids that focused on learning, teaching, and monitoring progress. As so, teachers can manage their lessons, instruction, and assessment in line with implementing curriculum in order to meet the demands of the various student's needs. Similarly, the study of Blase and Blasé (2000) proposed that when principals and teachers have productive discussions about instruction, and processes such as inquiry, reflection, discovery, and experimentation, teachers tend to develop flexible alternative competencies rather than a set of fixed teaching methods and approaches. Principals then need to acknowledge two fundamental things to practice knowledge of the curriculum and instruction, including the universal procedures necessary for successful teaching and learning and particular requirements and preferences of teachers (Weber, 1996).

The findings of this study also revealed that principals working on managing curriculum and instruction impact the capacity of teachers to establish a positive learning environment. These may result from principals and teachers in NGSs admitting the importance of providing a positive learning environment (i.e., the physical and psychological environment) that allows students to learn and develop themselves effectively. Patterson and Patterson (2004) stated that teachers and students work most effectively when there is trust, support, and care within them. Leithwood, Louis, Anderson and Wahstrom (2004) mentioned that the role of the principal as a curriculum leader is to keep an eye on how teachers are performing while also facilitating structures that compromise good practice and using systematic thinking in addressing related administrative tasks in order to ensure student learning. Thus, principals could promote the effective and consistent performance of teachers.

The findings further demonstrated that principals managing curriculum and instruction affect the teachers' digital competencies positively. It has been seen that the development of computer-based learning, virtual courses, game-based learning, interactive multimedia, and other digital learning advances encourages students to learn independently. As mentioned in New Generation School operational policy guidelines,

NGSs have been provided the authorization to modify its curriculum, which mainly focuses on equipping technology in teaching and learning. Thus, this allows NGSs to use technology, which is a key strategy to advance 21st century learning for teachers and students (MoEYS, 2019). Iacuzzi, Fedele, and Garlatti (2021) claimed that principals prioritize digital engagement to provide effective service and intellectual capital support of learning resources, which is crucial for creativity both in teachers and students.

In addition, the findings revealed that principals managing curriculum and instruction impact the capacity of teachers to reflect their professional practice. The finding was supported by the study of Danielson (2001), who mentioned that effective curriculum leaders committed to improving teacher quality at all stages of the development process, including mentoring and evaluating. Principals establish clear standards for professional development by using various methods in supporting and evaluating teachers. It is in accordance with the study of Copland and Knapp (2006), who stated that the effective curriculum leader offers comprehensive development and chances for collaboration and promotes the establishment of professional learning communities for teachers that result in internal change. By doing so, principals inspire teachers to reflect on their professional practice and instruction (Ahmad et al., 2022).

Moreover, the findings also revealed that principals managing curriculum and instruction impact the capacity of teachers to engage with parents and the community. It has been viewed that schools nowadays need to be welcoming and open to student and parent interaction. Liang, Niu, Cheng and Qin (2022) mentioned that the involvement of parents and other interested parties in education promotes student autonomy and teamwork to explore and maximize creativity and innovation in the classroom. Wiles (2008) asserted that the principals, as the most successful curriculum leaders embrace the dynamic nature of their profession and go further than the standard of duty. He added that principals work on setting direction, coordinating personnel and resources, inspiring stakeholders, and supporting procedures to improve schools. With this regard, the strong leadership at the curriculum management level of the principals is accessible to stakeholders involved with specific duties for instruction (Spillane, Halverson, and Diamond, 2001).

2) Driving Data to Make Instructional Decision

The results showed that the Driving Data to Make Instructional Decision (X₅) component is the second-best predictor of principals' instructional leadership, which has a positive effect on the overall teachers' 21st century teaching competencies in NGSs. However, based on the findings, it was found that principals driving data to make instructional decisions have a positive impact on *exercising teacher leadership competencies, comprehending subject contents competencies, and reflecting professional practice competencies*. Meanwhile, it has a negative effect on *teaching pedagogy competencies and engaging with parents and community competencies*.

Driving Data to Make Instructional Decision is the strength of New Generation Schools since they are innovative schools required to use high technology in education. It has been viewed that the quick development of educational technologies has allowed teachers and principals access to a mass of comprehensive information about the aptitude, academic progress, and learning requirements of students (Datnow and Park, 2014). Based on the result, it can be explained that NGSs currently exists in a high-stakes of accountability environment where principals prioritize gathering data to measure how successfully a school performs its objectives and use that data to advise or influence school decision-making. Some studies have argued that the use of data will prove to be vital in accountability measures and school improvement efforts (Petrides and Guiney, 2002; Culp, Honey and Mandinach, 2005; Light, Wexler and Heinze, 2005; Petrides and Nodine, 2006). Schildkamp and Kuiper (2010) mentioned that principals are responsible for driving data effectively by defining a clear vision for data usage, offering specialized support, allowing for more autonomy in data use, and fostering a safe learning environment where data is utilized for school improvement. Further research (e.g., White, 2011) addressed that when it comes to responding and fulfilling the demands for student accomplishment and school development, principals need to utilize the schools' data. Without evaluating and debating data, schools are unlikely to recognize and address the issues that require attention, identify the best treatments to address those issues and understand how they are doing in terms of achieving the objectives (Killion and Bellamy, 2000).

Based on the finding, it was significantly indicated that the activities of principals driving data to make instructional decision impact positively the exercising

teacher leadership competencies. This may explain that NGS principals might have analyzed the schools' data to assist any support to their teachers. Albiladi, Lasater and Bengtson (2020) mention that effective data-driven decision-making is typically supported by excellent leadership, and data is gathered and used by school principals to guide instructional decisions. He further added that teachers contain teacher leadership skills when they sustaining a culture of data which refers to a certain group or organization's norms, attitudes, and behaviors support and promote the use of evidence, such as facts, figures, and statistics, to guide their decision-making that determined by their data literacy, self-efficacy, accessibility to data, and understanding of their leaders' data-use expectations.

The findings also indicated that the activities of principals driving data to make instructional decision have a positive impact on teacher comprehension subject contents. It has been viewed that when principals suggest teachers analyze summative assessment data provided to the entire class, teachers need to identify the knowledge gap between current and earlier classes of their students. Based on the information being collected, it help teachers to notice the difficulty of students with the lesson being taught. Thus, teachers need to evaluate their recent subject contents. Lasater, Albiladi, Davis and Bengtson (2020), teachers cannot move further with the problem-solving process until they make the connection between the student's difficulties and teachers' practice, or teaching weaknesses. In addition, Lasater, Albiladi, Davis and Bengtson (2020) added that this culture of data use gives teachers an incentive to complete a cycle of learning that includes curriculum, instruction, and assessment on the way to more effective and ambitious instruction in the classroom and across the school.

Another important finding demonstrated that the activities of principals driving data to make instructional decisions have a positive impact on teachers' reflecting professional practice. According to some researchers, the most promising strategy for advancing schools on a big scale is for principals to use data as a leadership approach to enhancing school performance (Sun, Johnson, and Przybylski, 2016). Datnow and Park (2014) stated that the opportunity for school development lies in altering student learning and teaching methods. The purposeful using data from observation and feedback with a focus on instructional development had a positive

significant link to the instructional climate of a school and helped produce favorable student outcomes (Ing, 2013). Teachers typically rely on assignments and test results to give them an understanding of how well their students are doing. Meanwhile, data-driven education gives teachers a much more in-depth report on the retention rate in their classroom (Van Geel et al., 2016). As so, using data to inform instructional decisions has been shown to boost accomplishment gains by up to an extra month on standardized tests.

However, it's interesting to be aware that there is conflicting evidence in the literature on the link between improving student or school performance and the use of data for instructional decision-making (Mandinach, 2012). It was mentioned in the study of Staman, Timmermans and Visscher (2017) that there was no discernible link between student performance and the use of data. Meanwhile, Van and Visscher (2016) discovered that there was a link between the utilization of data and the improvement of teacher effectiveness in the areas of instructional strategy and student engagement.

However, this study found a negative impact of principals driving data to make instructional decision on teaching pedagogy competencies of teachers in NGSs. It has been viewed that using school-level data to estimate the performance of teachers and student is one important leadership strategy of principals (Yoon, 2016). However, the study of Marsh and Farrell (2015) offered evidence in support of the claim that although principals have access to observational data, they frequently lack the skill to use or leverage the information to alter teachers' instructional methods. In the study of Little (2012) argued that the existing research suffers from a lack of insight into how teachers exactly use data, and it is not clear to what extent teachers change their practices. Moreover, it may be challenging for teachers to rely on the results of standardized tests to immediately relate to routine classroom practices (Halverson, 2010).

Moreover, the findings also revealed that principals driving data to make instructional decision activities negatively impact teachers' engaging with parents and community competencies in NGSs. According to most of the literature, teachers use data to enhance their lessons and student progress (Jennings, 2012; Liou et al., 2014; Little, 2012; Schildkamp and Kuiper, 2010; Wohlstetter, Datnow, and Park, 2008).

Meanwhile, principals frequently decide where and which areas should be given priority to develop first in schools (Little, 2012). With this regard, the use of school data in NGSs might mainly focus on increasing student academic progress. As so, it may point out the fact that most teachers regard their duties of data accessing with student academic performance or student assessment.

3) Sharing Leadership

The results of this study demonstrated that the Sharing Leadership (X_6) component of principals' instructional leadership has an overall positive effect on teachers' 21st century teaching competencies in NGSs. It has been seen that the activities of principals sharing leadership positively affect *comprehending subject contents competencies, teaching pedagogy competencies, and reflecting professional practices competencies* while affecting negatively *inspiring students in learning competencies*.

It is obvious that teacher leadership is more and more crucial for school management and development. Sharing Leadership supporting teacher leadership in school appeared to be another strong point of New Generation Schools since the principal and teachers are provided freedom in school management. Huber (2004) mentioned that sharing leadership in school is frequently seen as an action that demonstrates intentional patterns of dedication and mutual influence among principals and teachers. While Leithwood and Beatty (2007) stated that a teacher's job nowadays is not only to instruct students in class but also to participate in leadership and decision-making tasks. The increasing teachers' influence in schools provides a positive and significant effect on school improvement (Leithwood et al., 2008). It is in accordance with a study by Printy and Marks (2006), who stated that shared instructional leadership by principals and teachers has an impact on teachers and students learning.

The findings of this study showed that the activities of principals sharing leadership have a favorable impact on comprehending subject contents competencies of teachers in NGSs. It has been viewed that teachers will feel more empowered and responsible for their professional development when principals share leadership with them (Charernnit et al., 2021). Cobb, Mc, Lamberg and Dean (2003) mentioned that teachers actively need to seek up-to-date knowledge and skills in order to broaden their

existing skill sets and achieve the objectives of curriculum design. In this regard, principals have a role in supporting teacher learning, particularly in practice groups (Prestine and Nelson, 2005).

The findings of this study further indicated that the activities of principals sharing leadership have a positive and significant impact on the teaching pedagogy competencies of teachers in NGSs. It has been viewed that principals sharing leadership through stimulating conversation and encouraging and respecting teachers' creativity regarding classroom practice influence teaching (Blasé and Blase, 1999; Louis and Wahlstrom, 2011). By acknowledging the diversity of teachers' instructional methods, principals foster a strong professional learning community and create a robust instructional climate (Louis, Dretzke and Wahstrom, 2010) where teachers can learn to improve their instructional practices.

In addition, the findings also indicated that principals sharing leadership activities inspire teachers to reflect on their professional practices. It has been viewed that when principals and teachers share leadership responsibilities, teachers are more likely to cooperate, learn from others, and progress in their professional practices while having meaningful discussions with other professionals about projects for school development (Printy and Marks, 2006). Prior research (e.g., Gonzales and Jackson, 2020; Mukaram et al., 2021; Price, 2021) claimed that shared leadership improves group cohesion and trust while influencing how individuals cooperate to achieve their shared objectives.

Though, the findings showed that principals sharing leadership activities negatively impact teachers' inspiring students in learning competencies. It can be assumed that sharing leadership may involve the connection between principals and teachers with no bearing on students. In this case, NGS principals sharing leadership behaviors might more likely focus on specific actions to ensure teachers comprehending subject contents, instruction, and professional practices of teachers. As in the previous studies (e.g., Ogawa and Bossert, 1995; Blasé and Blasé, 1999; and Marks and Printy, 2003) indicated that by sharing instructional leadership, the principal and teachers actively work together on the curriculum, instruction, and assessment. According to this paradigm, the principals and teachers are jointly accountable for curriculum and task supervision.

4) Supervising Teaching and Learning Process

The findings of this study emphasized that the Supervising Teaching and Learning Process (X₄) component of principals' instructional leadership has an overall positive effect on the teachers' 21st century teaching competencies. Based on the findings, it is seen that the activities of principals supervising teaching and learning processes impact *digital competencies*, *inspiring students in learning competencies*, *engaging with parents and community competencies*, and *exercising teacher leadership competencies* positively while affecting *comprehending subject contents competencies* and *establishing a positive learning environment competencies* negatively.

It has been viewed that in order to ensure that all students succeed in all aspects of development, principals must play a crucial role in leadership and management in school. While, to bring out the most significant change in the teaching and learning process, teachers must enhance and ensure their professional practices. Wiyono, Rasyad and Maisyaroh (2021) demonstrated a considerable impact of collegial supervising techniques and the collaborative supervision strategy on performance-based learning performed by teachers. Academic supervision by school principals can assist, direct, and inspire teachers to develop their professional skills when it comes to the delivery of instruction and learning experiences in the classroom (Suhardan, 2010; Lorensius et al., 2022). Dewi and Singh (2022) stated that teaching supervision is a strategy for encouraging teachers to develop their critical thinking and creativity skills.

The results of this study showed that principals' activities of supervising the teaching and learning process impact strongly on digital competencies of teachers. It is viewed that instructional principals who have responsibilities as a supervisor must be able to investigate, assemble, and determine which criteria are essential for a teacher's development (Devi, Harapan and Wardiah, 2021). Likewise, in New Generation Schools, principals have set instructional goals concerning New Generation School policy, aiming to improve school achievement and guarantee practical instruction, which enhances teaching innovation (Bo, 2021). As the New Generation School operational policy guidelines is set to raise teaching standards by investing heavily in educational technology while offering students and teachers access to digital education (MoEYS, 2019), principals' supervision might need to focus on technology use.

Furthermore, the findings of this study indicated that principals work on supervising the teaching and learning process has a positive and significant influence on teachers' inspiring students in learning and engaging with parents and community competencies. As teachers have a crucial role in teaching and learning activities, they must contribute to education in the school environment, particularly in teaching and learning. Meanwhile, it has been viewed that the impact of the principal's guidance on the teacher's performance cannot be separated. As a supervisor, principals empower teachers by offering support and encouragement while appreciating teachers' professional practice in cooperating with other personnel and stakeholders to carry out their tasks (Devi, Harapan, and Wardiah, 2021). According to the findings, it may result from New Generation Schools prioritizing the new teaching strategies and the involvement of parents in school (MoEYS, 2019). Therefore, the NGS principals might need to set up supervision criteria to check their teacher performance regardless of implying multi-teaching techniques and building a connection with stakeholders.

Furthermore, the findings discovered that the activities of NGS principals working on supervising teaching and learning practices provide a positive and significant impact on exercising teacher leadership competencies. It has been viewed that teachers exercising leadership improve student learning and develop teacher professional practices (Pan and Chen 2021). Some previous studies (e.g., Leithwood et al., 2004; Printy and Marks, 2006) stated that by advising teachers about instructional issues, principals enhance teacher performance and promote teacher leaders. The principals support teachers to achieve high standards and develop their leadership capacity through managing performance, effective continuing professional learning, and feedback. Likewise, in New Generation Schools, principals might design their supervision by focusing on promoting teacher leaders since it will ensure and foster teachers' performance standards.

It has been viewed that educational facilities cannot be used to support student's academic achievement without teachers who exhibit the necessary behavioral characteristics and proficiency (Obadara, 2005). Thus, the effectiveness and excellence of any school system depend on the teachers' knowledge and performance. Fehintola (2014) noticed the relationship between teachers' behavioral characteristics,

competency, and productivity with students' academic results. The professionalism of the teachers can be enhanced by the process of instructional supervision (Okendu, 2012). Principals act as catalysts to help implement a variety of instructional activities that will improve teaching since instructional supervision constitutes the leverage point for instructional improvement, teacher competence, and efficiency of the educational system (Archibong, 2010).

However, the findings of this study emphasized that the principal's work in the supervision area provide a negative influence on the teacher's comprehending subject contents. Based on the findings, it may explain that supervision in New Generation Schools may not focus on the teachers' improvement of subject contents due to the Cambodia MoEYS's highly centralized administration and standardized education on student outcomes (competence). NGS principals would like to take control and direct their teachers' practice following MoEYS standards. As so, the supervision may put pressure on teachers to focus on students' outcomes/tests rather than doing research and learning on extra subject contents. The instructional supervision then should be given professional teachers the freedom to investigate novel ways to advance their professional growth and the comprehension of their responsibility. Principals can assist help to teachers by providing some related resources or documents which teachers need such as school intranet, internet, or academic consultation (Chen, 2018).

Furthermore, the results of this study further illustrated that principals' work in the supervision area has a negative impact on establishing a positive learning environment competencies. The findings may result from NGS principals might prioritize the supervision of teaching and assessment training too much so that teachers may not have enough time to create a student learning environment. Although it has been viewed that the supervising teaching and learning process gives teachers on-the-job training and assessment in the form of evaluating lesson plans, methods of instruction, and capacity for classroom management (Ukeje, 1979), the process of instructional supervision may somehow interrupt or distract the process of teaching and learning (Chen, 2018). Supervising teaching and learning then should be made to provide teachers the opportunity to express themselves freely and confidently and help students mentally prepare for the supervising process in the classroom. Meanwhile,

Mandal (2018) suggested that in order to establish a positive learning environment for students, teachers need to apply a multiplicity of resources in instruction. Anuna (2004) stated that the teaching materials that are employed have a significant impact on student's academic success since they offer more practical instructions for students. Also, the majority of teaching materials demand funding. Hence, principals must ensure that the resources needed, such as pertinent books or documents and materials used in labs and libraries, are provided to teachers and students.

5) Developing and Sustaining School Vision

The findings of this study discovered that the Developing and Sustaining School Vision (X₁) component of principals' instructional leadership has an overall positive effect on teachers' 21st century teaching competencies. It has been seen that the activities of principals developing and sustaining school vision positively affect *inspiring students in learning competencies, reflecting professional practice competencies, teaching pedagogy competencies, digital competencies, and exercising teachers leadership competencies*, while affect negatively *comprehending subject contents competencies and establishing a positive learning environment competencies*.

It has been viewed that the principal, as a school leader, is expected to create and communicate the school's vision for school development (Copland, 2003). Marks and Printy (2003) mentioned that school principals have thoroughly examined and evaluated the school goals clearly by using a participatory process to initiate the vision, project, and plans for the school, including following up the implementation of the school's vision and mission systematically. It is in accordance with the study of Hallinger and Murphy (1985), who addressed that determining the mission will improve school performance. Within the process of achieving a school mission, teachers must master professional performance for excellence to be achieved easily (Davis and Boudreaux, 2019).

The findings of this study revealed that the activities of principals working on developing and sustaining school vision provide a positive and significant impact on *inspiring students in learning competencies, reflecting professional practice competencies, teaching pedagogy competencies, digital competencies, and exercising teacher leadership competencies* of teachers in NGSs. These may result from the

requirement of New Generation Schools to be innovative schools promoting innovation. It is expected that New Generation Schools will improve innovation, such as enhanced curricula (e.g., intensive learning in the STEM subjects), ICT in education (e.g., m-Learning, software-driven assessment, and learning, etc), differentiated learning channels to accommodate students' strengths and interests (e.g., subject clubs) (MoEYS, 2019). The NGS principals then would develop the school vision focusing on these components following the NGS standard and policy.

Odhiambo and Hii (2012) proposed that in order to achieve high standards of instruction and learning, principals need to maintain a future-focused vision for the school, offering teachers the necessary tools to perform their tasks proficiency, evaluating and providing teachers feedback, and evaluating students' progress. Correspondingly, Bo (2021) stated in her study that school principals and teachers in NGSs work collaboratively to run the school. She added that NGS principals have set educational goals, select the most effective way to accomplish goals through practical instruction and prepare the professional development for teachers. Teachers in NGSs are encouraged by principals to enhance the quality of their teaching through participating in professional learning communities (PLCs), practicing constructivist and problem-based learning strategies, etc. In addition, as stated in New Generation School operational policy guidelines, teachers are provided special incentives, encouraging them to use ICT in the classroom, creating subject clubs, and other extracurricular activities, which will inspire innovative learning (MoEYS, 2019). Teachers apply leadership practice when teachers are reported to support each student learning, improve their instruction, and build a positive school culture (Araskal and Kiliñç, 2019).

However, it was found in the finding of this study that principals developing and sustaining school vision has negative impact on comprehending subject contents competencies and establishing a positive learning environment competencies. Based on the findings, this may result from schools developed visions concerning the New Generation School policy which mainly focus on implementing new teaching method and principals might need to supervise their teachers base on the school visions. That remarked the negative effects of the school vision are same as those of the supervision.

The rationale is the principals may take the traditional supervision focusing on teaching and evaluation training so it may prevent the teachers from learning subject contents and creating learning environments.

It has been viewed that when teachers internalize educational objectives into personal objectives, it has an impact on how actively they engage in learning activities, especially and most directly on how effectively they stay up to date with novel information (Bennis and Nanus, 1985). Sfard (1988) and Ten Dam and Blom (2006) stated that teachers take control of their professional development and acquire the knowledge and information needed to participate critically in social and cultural practices associated with the instruction. They further added, in general, teachers who are more confident in their abilities are more engaged in educational activities. However, the challenge for teachers is not only to recognize and acquire mastery of specific instructional strategies and behaviors recognized as effective practices but also to develop the ability to effectively match such strategies and behaviors, at the appropriate time, to individual students and student groups in particular teaching situations as these relate to the teacher's desired student learning outcomes (Hunt et al., 2009).

6) Promoting School Learning Environment

The finding indicated that the Promoting School Learning Environment (X₃) component of principals' instructional leadership has an overall positive effect on teachers' 21st century teaching competencies. However, it has been seen that when compared to other components of principals' instructional leadership, promoting school learning environment component has the most negative impact on the teachers' 21st century teaching competencies. It affects positively three components of the teachers' 21st century teaching competencies, including *engaging with parents and community competencies*, *establishing a positive learning environment competencies*, and *inspiring student in learning competencies*. Meanwhile, affect negatively three components of the 21st century teaching competencies, including *teaching pedagogy competencies*, *reflecting professional practice competencies*, and *digital competencies*.

It has been viewed that when principals value activities of promoting a positive learning environment in schools, it will provide a positive way for

implementing changes in schools (Gonder and Hymes, 1994). Physical learning environment is a good educational setting where the atmosphere is comfortable, quiet, sociable, and upbeat, with a cohesive learning experience (Mercier et al., 2023). Murphy (1990) stated that instructional school principals focus on promoting a conducive school learning environment. Principals contribute to a stimulating learning environment that will enhance student performance and teacher job satisfaction. Teaching and learning will go well in a friendly school learning environment. Meanwhile, it has been viewed that New Generation Schools are encouraged to modernize learning environments, such as using new innovative designs in educational architecture to transform classrooms and other school facilities to align with 21st century standards and to promote up-to-date teaching and learning strategies (MoEYS, 2019).

The findings of this study showed that the activities of principals in promoting school learning environment positively affect teachers' 21st century teaching competencies, such as engaging with parents and community, establishing a positive learning environment, and inspiring students in learning.

It could be concluded that NGS principals acknowledge and concentrate on building a positive learning environment that helps foster school excellence and teaching and learning efficiency. Egwu (2015) mentioned that there are significant impacts of the school learning environment on students' commitment, behavior, self-belief, social-emotional learning, teacher burnout, and overall school and work life of students and teachers. At the same time, developing a school learning environment or infrastructure could be promoted by engaging stakeholders and communities in school activities (Tabroni and Ismiati, 2021). Meanwhile, some previous literature (e.g., Cohen, 2006; Mahoney and Hextall, 2000) proposed that promoting a positive learning environment depends upon leadership. As stated in New Generation School operational policy guidelines, fostering academic performance in NGSs requires creating a favorable learning environment, both physically and psychologically. With this regard, NGS principals might need to ensure their teachers maintain emotional stability over the school administration while keeping modernized physical learning environments (MoEYS, 2019).

Furthermore, the finding of this study showed that principals' activities of promoting school learning environment impact negatively on some competencies of teachers, including teaching pedagogy, digital competencies, and reflecting personal practices. According to previous research, classroom technology, lighting, temperature, and student comfort, all have a considerable favorable impact on students' performance and attitude (Hurst, 2005). Likewise, when NGS principals focus on promoting a school learning environment, they might expect their teachers to make an effort to create and develop a learning environment in the schools. As principals keep assigning teachers to spend much time creating the physical learning environment, it may distract teachers' professional development sessions (e.g. teaching pedagogy, digital competencies, and reflecting personal practices). Research also showed that the principal's effect on school climate influences the feelings that teachers have about their work (Littrell, Billingsley and Cross, 1994).

3. Recommendation

The bellow recommendations were proposed based on the findings of this study and were organized as recommendation for implication and recommendation for further study.

3.1 Recommendation for implication

1. The results of this study found that managing curriculum and instruction is the 1st best predictor affecting teachers' 21st century teaching competencies. Thus, NGS principals should keep focusing on managing curriculum and instruction. The Principals must keep reviewing a robust approach to check on the curriculum and pedagogy and keep informing teachers about discoveries to ensure that their teachers can provide a modern teaching method for students. Moreover, the principals must identify the need for curriculum innovation and improvement that support local and international contexts while inspiring teachers to develop their teaching practice based on research and new technologies. Furthermore, the principals need to keep setting up activities (e.g. co-curricular activities, extracurricular activities, etc.) that inspired teaching and learning. Therefore, in order to ensure sustainable works in this area, the principals need to keep up-to-date knowledge about curriculum development, instructional pedagogy, and educational trends in the current educational context.

2. The results of this study showed that driving data to make instructional decision is the 2nd best predictor for 21st century teaching competencies. NGSs principals must ensure accountability in instructional decision-making based on the exact data. More importantly, the principals must assess the implications of change at the individual and school levels based on regular and exact data. Also, the principals need to provide teachers with a clear understanding of driving data to make instructional decisions and motivate and energize teachers to commit to evidence-based development, change, and improvement to enhance student learning. More than that, the principals should find ways to help teachers interpret school data and imply the results properly to benefit their academic performance. However, the principals need to encourage teachers to pay more attention to their professional development, improving instructional methods and students' achievement rather than focus figuring out the data. Ultimately, the principals have to ensure that driving data activities do not take too much teachers' time to possess in these duties. Thus, the principals need to develop a systematic process for the facilitation of gathering and analyzing data to ensure that school personnel can access those processes openly and quickly. As so, teachers could have enough time to develop their professional knowledge.

3. The results of this study indicated that sharing leadership is the 3rd best predictor affecting teachers' 21st century teaching competencies. Here, NGS principals should inspire and empower teachers to take teacher leadership role and develop their competencies for it. Then, the principals should let all of them participate in school management, particularly school curriculum and instruction.

4. The findings also indicated that supervising teaching and learning process is the 4th predictor and developing and sustaining school vision is the 5th predictor affecting 21st century teaching competencies of teachers in NGSs. The school vision and supervision then must focus on teachers' professional development and ICT-based, innovative curriculum and instruction implementation to enhance student achievement, as following NGS vision and regulation. However, the supervision should go beyond the traditional approach, such as monitoring, directing, and training, as well as teaching and evaluation focus, toward empowering, coaching, mentoring, and letting the teachers study and learn together through PLC. Also, the supervision and professional

development program should be comprehensive, including subject content, pedagogy, evaluation, classroom management, and creating a positive learning environment.

5. The results of this study showed that promoting school learning environment is the worse predictor affecting teachers' 21st century teaching competencies. The results showed that NGS principals promoting school learning environment effect negatively three components, including teaching pedagogy, reflecting professional practice, and digital competencies, which are core competencies required for NGS teachers to remain necessary. The principals should ensure that teachers still have sufficient time and opportunities for their professional development when assigning them to make an effort on creating and developing a school learning environment.

3.2 Recommendation for future research

The future research study should involve more informants, including the school principal to investigate the effect of principals' instructional leadership on teachers' 21st century teaching competencies. It would also be valuable for future research to compare the principals' instructional leadership affecting teachers' 21st century teaching competencies among schools in urban and rural areas to build sufficient evidence to set up future educational leadership policies. Also, there should be a study on the other leadership style which might affect teachers' 21st century teaching competencies for teachers.

REFERENCES:

- Ahmad, Z. E. I. R., Anantanukulwong, R., & Faikhamta, C. (2022). Trends of teacher professional development strategies: A systematic review. *Shanlax International Journal of Education*, 10(2), 1-8.
- Albiladi, W. S., Lasater, K., & Bengtson, E. (2020). Data use among principals and teachers: divergent paths or common ground? Implications for the leadership preparation programs. *Journal of School Administration Research and Development*, 5(2), 63-76.
- Alig-Mielcarek, J. M. (2003). *A Model of school success: Instructional leadership, academic press, and student achievement*. The degree of Doctor of Philosophy in the Graduate School of The Ohio State University. Columbus, OH: The Ohio State University.
- Alig-Mielcarek, J. M. & Hoy, W. K. (2005). *Instructional leadership*. Greenwich, CT: Information Age Publishing Inc.
- Anuna, M. C. (2004). *Educational supervision: The Nigerian experience*. Owerri, Nigeria: International University Press Ltd.
- Araskal, S., & Kiliñ, A. Ç. (2019). Investigating the factors affecting teacher leadership: a qualitative study= Öğretmen liderliğini etkileyen faktörlerin incelenmesi: Nitel bir araştırma. *Educational Administration: Theory and Practice*, 25(3), 419-468.
- Archibong, F. I. (2010). Instructional supervision in the administration of secondary education: a panacea for quality assurance: *European Scientific Journal*, 8(13), 61-70.
- Arrington, J. D. (2014). *Creating 21st century classrooms: What district level instructional leaders know about leading 21st century learning*. Lincoln, NE: University of Nebraska-Lincoln.
- Ashida, A., & Chea, P. (2017). School finance in Cambodia: Challenges and recommendations for effective school grants implementation. In UNESCO Bangkok. (Ed.). *Ensuring adequate, efficient and equitable finance in schools in the Asia-Pacific Region* (pp. 83–103). Paris: UNESCO Bangkok Office.

- Azila-Gbetteor, E. M., Mensah, C., & Abiemo, M. K. (2022). Self-efficacy and academic programme satisfaction: Mediating effect of meaningfulness of study. *International Journal of Educational Management*, 36(3), 261-276.
- Bacharach, B. (1990). *Education reform: Making sense of it all*. The United States: Department of Education describes its education reform efforts.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman and Comp.
- Barth, R. (1990). *Improving schools from within: Teachers, parents, and principals can make the difference*. San Francisco, CA: Jossey-Bass.
- Bayne-Jardine, C., Bayne-Jardine, C. C., Hoy, C., & Wood, M. (2005). *Improving quality in education*. Abingdon, Oxfordshire: Routledge.
- Bellibaş, M. Ş., Polatcan, M., & Kılınc, A. Ç. (2022). Linking instructional leadership to teacher practices: The mediating effect of shared practice and agency in learning effectiveness. *Educational Management Administration and Leadership*, 50(5), 812-831.
- Bendikson, L., Robinson, V., & Hattie, J. (2012). Principal instructional leadership and secondary school performance. *SET: Research Information for Teachers*, 1(1), 2-8.
- Bennis, W., & Nanus, B. (1985). *Leaders: The strategies for taking charge*. New York, NY: Harper & Row.
- Blank, M. J., Melaville, A., & Shah, B. P. (2003). *Making the difference: Research and practice in community schools*. Washington, DC: Institute for Educational Leadership.
- Blase, J., & Blase, J. (1999). Principals' instructional leadership and teacher development: Teachers' perspectives. *Educational Administration Quarterly*, 35(3), 349-378.
- Blase, J., & Blase, J. (1998). *The handbook of instructional leadership: How really good principals promote teaching and learning*. Thousand Oaks, CA: Corwin Press.
- Blase, J., & Blase, J. (2000). Effective instructional leadership: Teachers' perspectives on how principals promote teaching and learning in schools. *Journal of Educational Administration*, 38(2), 130-141.

- Bo, C. (2021). New generation schools in Cambodia: Innovative school governance for sustainable quality of 21st century learning and instruction. *Proceedings of the 4th International Conference on Research of Educational Administration and Management (ICREAM 2020)* (pp. 510-513). Palembang, Indonesia: Atlantis Press.
- Bredenberg, K. (2018). *Secondary education in Cambodia: The progress of reform*. Phnom Penh, Cambodia.
- Brolund, L. (2016). Student success through instructional leadership. *BU Journal of Graduate Studies in Education*, 8(2), 42-45.
- Brookover, W. B., & Lezotte, L. W. (1977). *Changes in school characteristics coincident with changes in student achievement*. East Lansing, MI: The Institute for Research on Teaching, Michigan State University.
- Brookover, W., & Lezotte, L. (1979). *Changes in school characteristics coincident with changes in student achievement*. East Lansing, MI: The Institute for Research on Teaching, Michigan State University.
- Brookover, W. (1982). *Creating effective schools: An in-service program for enhancing school learning climate and achievement*. Holmes Beach, FL: Learning Publications.
- Bridges, E. M. (1967). Instructional leadership: A concept re-examined, *Journal of Educational Administration*, 5(2), 136-147.
- Bush, T. (2012). International perspectives on leadership development: Making a difference. *Professional Development in Education*, 38(4), 663-678.
- Caena, F., & Redecker, C. (2019). Aligning teacher competence frameworks to 21st century challenges: The case for the European Digital Competence Framework for Educators (Digcompedu). *European Journal of Education*, 54(3), 356–369.
- Castells, M. (2010). Globalisation, networking, urbanisation: Reflections on the spatial dynamics of the information age. *Urban Studies*, 47(13), 2737-2745.
- Chakravart, N. L., & Roy, B. (1967). *Handbook of methods of applied statistics*. Hoboken, NJ: John Wiley and Sons.
- Charernnit, K., Mathur, A., Kankaew, K., Alanya-Beltran, J., Sudhakar, P. J., Singh, S., & Singh, N. D. (2021). Interplay of shared leadership practices of principals,

- teachers' soft skills and learners' competitiveness in COVID 19 era: Implications to economics of educational leadership. *Studies of Applied Economics*, 39(12), 1-15.
- Chen, C. C. (2018). Facilitation of teachers' professional development through principals' instructional supervision and teachers' knowledge-management behaviors. *Contemporary Pedagogies in Teacher Education and Development*, 51(10), 51-64.
- Childs-Bowen, D., Moller, G., & Scrivner, J. (2000). Principals: Leaders of leaders. *NASSP Bulletin*, 84(616), 27-34.
- Chrispeels, J. H., Castillo, S., & Brown, J. (2000). School leadership teams: A process model of team development. *School Effectiveness and School Improvement*, 11(1), 20-56.
- Chu, S. K. W., Reynolds, R. B., Tavares, N. J., Notari, M., & Lee, C. W. Y. (2014). *21st Century Skills Development Through Inquiry-Based Learning*. Singapore: Springer Nature.
- Chu, S. K. W., Reynolds, R. B., Tavares, N. J., Notari, M., & Lee, C. W. Y. (2017). *Twenty-First Century Skills and Global Education Roadmaps*. Singapore: Springer Nature.
- Clark, D. (1980). An analysis of research, development, and evaluation reports on exceptional urban elementary schools. In Phi Delta Kappa (Ed.), *Why do some urban schools succeed?* Bloomington, IN: Phi Delta Kappa.
- Cobb, P., McClain, K., Lamberg, T., & Dean, C. (2003). Situating teachers' instructional practices in the institutional setting of the school and district. *Educational Researcher*, 32(6), 13–24.
- Cohen, J. (2006). Social, emotional, ethical and academic education: Creating a climate for learning, participation in democracy and well-being. *Harvard Educational Review*, 76(2), 201-237.
- Copland, M. A. (2003). Leadership of inquiry: Building and sustaining capacity for school improvement. *Educational Evaluation and Policy Analysis*, 25(4), 375-395.
- Copland, M. A., & Knapp, M. S. (2006). *Connecting leadership with learning: A framework for reflection, planning, and action*. Alexandria, VA: Association for Supervision and Curriculum Development.

- Cosanay, G., & Karali, Y. (2022). Examination of classroom teachers' 21st century teaching skills. *International Online Journal of Education and Teaching*, 9(1), 432-448.
- Cuban, L. (1984). Transforming the frog into a prince: Effective schools research, policy, and practice at the district level. *Harvard Educational Review*, 54(2), 129-152.
- Cuenca, A. (2010). Self-Study research: Surfacing the art of pedagogy in teacher education. *Journal of Inquiry and Action in Education*, 3(2), 15-29.
- Culp, K. M., Honey, M., & Mandinach, E. (2005). A retrospective on twenty years of education technology policy. *Journal of Educational Computing Research*, 32(3), 279-307.
- Danielson, C. (2001). New trends in teacher evaluation. *Educational Leadership*, 58(5), 12-15.
- Daresh, J.C. (2007). *Supervision as proactive leadership*. Long Grove, IL: Waveland Press.
- Darling-Hammond, L. (2006). Constructing 21st-century teacher education. *Journal of Teacher Education*, 57(3), 300-314.
- Datnow, A., & Park, V. (2014). *Data-driven leadership*. San Francisco, CA: Jossey-Bass.
- Davis, F., & Boudreaux, M. K. (2019). Teacher leaders' perceptions of charter school principals' instructional leadership practices. *Journal of Educational Research and Practice*, 9(1), 89-103.
- Day, C., Sammons, P., & Gorgen, K. (2022). *Successful leadership*. Berkshire, England: Education Development Trust.
- Dede, C. (2009). Comparing frameworks for 21st century skills. *21st Century Skills: Rethinking How Students Learn*, 20(10), 51-76.
- Devi, D., Harapan, E., & Wardiah, D. (2021). The Implementation of principal's supervision in SD Negeri Tungkal Ilir Banyuasin (Teacher's competency development study). *Journal of Social Work and Science Education*, 2(1), 60-68.
- Dewi, R., & Singh, P. (2022). The Effect of academic supervision and teacher professional competence on teacher performance. *PPSDP International Journal of Education*, 1(1), 122-131.

- Edmonds, R. (1979). Effective schools for the urban poor. *Educational Leadership*, 37(1), 15-24.
- Egwu, S. O. (2015). Principals' performance in promoting learning climate in Ebonyi State secondary schools. *Journal of Education and Practice*, 6(19), 64-70.
- Elliott, K. (2015). Teacher performance appraisal: More about performance or development? *Australian Journal of Teacher Education (Online)*, 40(9), 102-116.
- Elmore, R. (2000). *Building a new structure for school leadership*. Washington, DC: Albert Shanker Institute.
- Fancera, S., & Bliss, J. (2011). Instructional leadership influence on collective teacher efficacy to improve school achievement. *Leadership and Policy in Schools*, 10(3), 349-370.
- Fehintola, J. O. (2014). Teachers' characteristics as correlates of students' academic performance among secondary school students in Saki-west local government area of Oyo State. *Journal of Educational and social Research*, 4(6), 459-468.
- Freeman, D., Kuhs, T., Porter, A., Floden, R., Schmidt, W., & Schwille, J. (1983). Do text-books and tests define a national curriculum in elementary school mathematics? *Elementary School Journal*, 83(5), 501-513.
- Goldie, J. G. S. (2016). Connectivism: A knowledge learning theory for the digital age? *Medical Teacher*, 38(10), 1064-1069.
- Gonder, P. O., & Hymes, D. (1994). *Improving school climate and culture*. Arlington, VA: American Association of School Administrators.
- Gonzales, M. M., & Jackson, I. (2020). Going the distance: What school administrators can learn from one-to-one laptop schools. *Journal of School Administration Research and Development*, 5(1), 55-60.
- González-pérez, L. I., & Ramírez-montoya, M. S. (2022). Components of education 4.0 in 21st century skills frameworks: systematic review. *Sustainability*, 14(3), 1-31.
- Green, H., Facer, K., Rudd, T., Dillon, P., & Humphreys, P. (2005). *Personalization and digital technologies*. Bristol, England: Futurelab.
- Gulcan, M. (2012). Research on instructional leadership competencies of school principals. *Education*, 132(3), 625-635.
- Hallinger, P. (2005). Instructional leadership and the school principal: A passing fancy that refuses to fade away. *Leadership and Policy in Schools*, 4(3), 221-239.

- Hallinger, P. (2010). *Developing successful leadership*. Berlin, Germany: Springer Science and Business Media.
- Hallinger, P. (2011). A review of three decades of doctoral studies using the principal instructional management rating scale: A lens on methodological progress in educational leadership. *Educational Administration Quarterly*, 47(2), 271-306.
- Hallinger, P., & Heck, R. H. (2010). Leadership for learning: Does collaborative leadership make a difference in school improvement? *Educational Management Administration and Leadership*, 38(6), 654–678.
- Hallinger, P., Gümüş, S., & Bellibaş, M. Ş. (2020). “Are principals instructional leaders yet?” A science map of the knowledge base on instructional leadership, 1940–2018. *Scientometrics*, 122(3), 1629–1650.
- Hallinger, P., & Murphy, J. (1985). Assessing the instructional management behavior of principals. *The Elementary School Journal*, 86(2), 217-247.
- Hallinger, P., & Murphy, J. F. (1986). The social context of effective schools. *American Journal of Education*, 94(3), 328–355.
- Hallinger, P., & Murphy, J. F. (1987). Assessing and developing principal instructional Leadership. *Educational Leadership*, 45(1), 54-61.
- Hallinger, P., Walker, A., Nguyen, D. T. H., & Nguyen, T. T. (2017). Perspectives on principal instructional leadership in Vietnam: A preliminary model. *Journal of Educational Administration*, 55(2), 222-239.
- Halverson, R. (2010). School formative feedback systems. *Peabody Journal of Education*, 85(2), 130–146.
- Hang, C. N. (2018). *Education reform in Cambodia towards a knowledge-based society and shared prosperity*. Phnom Penh, Cambodia: Sipar Publishing.
- Harris, A. (2008). Distributed leadership: According to the evidence. *Journal of Educational Administration*, 46(2), 172–188.
- Harris, A., Jones, M., Cheah, K. S. L., Devadason, E., & Adams, D. (2017). Exploring principals’ instructional leadership practices in Malaysia: Insights and implications. *Journal of Educational Administration*, 55(2), 207-221.
- Hasan, M. (2016). Education development of 21st century school teachers’ teaching competencies in India. *Indian Journal of Research*, 5(5), 4–6.

- Healey, T. (2009). Creating greatness. *The Education Digest*, 75(1), 30-40.
- Henderson, A. T., & Mapp, K. L. (2002). *A New wave of evidence: The impact of school, family, and community connections on student achievement*. Austin, TX: National Center for Family and Community Connections with Schools.
- Henderson, A. T., Mapp, K. L., Johnson, V. R., & Davies, D. (2007). *Beyond the bake sale: The essential guide to family-school partnerships*. New York, NY: The New Press.
- Horn, S. (2020). *School leadership standards: Cambodian secondary school principals' perceptions of their capabilities and challenges in implementing a new draft of leadership competency framework*. Auckland, NZ: Research Space.
- Hoy, A. W., & Hoy, W. K. (2006). *Instructional leadership: A research-based guide to learning in schools*. New Zealand: Pearson Education.
- Huber, S. G. (2004). School leadership and leadership development: Adjusting leadership theories and development programs to values and the core purpose of school. *Journal of Educational Administration*, 42(6), 669-684.
- Hurst, M. D. (2005). Schools eye future costs. *Education Week*, 24(35), 34-39.
- Hunt, G. H., Touzel, T. J., & Wiseman, D. G. (2009). *Effective teaching: Preparation and implementation*. Springfield, Illinois: Charles C Thomas Publisher.
- Iacuzzi, S., Fedele, P., & Garlatti, A. (2021). Beyond coronavirus: The role for knowledge management in schools responses to crisis. *Knowledge Management Research and Practice*, 19(4), 433-438.
- Ing, M. (2013). What principals do to improve teaching and learning: Comparing the use of informal classroom observations in two school districts. *Journal of School Leadership*, 23(5), 846-864.
- Iqbal, A. (2021). Effects of principals' instructional leadership on teaching and learning practices: evidence from secondary school teachers at district Rawalpindi. *Pakistan Social Sciences Review*, 5(1), 829-842.
- Ismail, S. N., Don, Y., Husin, F., & Khalid, R. (2018). Instructional leadership and teachers' functional competency across the 21st century learning. *International Journal of Instruction*, 11(3), 135-152.

- Ismail, M. Z., Mansor, A. N., Iksan, Z., & Nor, M. Y. M. (2018). Influence of principals' instructional leadership on science teaching competency. *Creative Education, 9*(14), 2234-2244.
- Jackson, D. (2000). The school improvement journal: Perspectives on leadership. *School Leadership and Management, 20*(1), 61-78.
- Jan, H. (2017). Teacher of 21st century: Characteristics and development. *Research on Humanities and Social Sciences, 7*(9), 50–54.
- Jennings, J. L. (2012). The effects of accountability system design on teachers' use of test score data. *Teachers College Record, 114*(11), 1–23.
- Kampuchea Action to Promote Education. (2014). *Creating a New Generation of Schools in Cambodia: Experimenting in New Governance Structures to Create High Quality Education Models*. Phnom Penh, Cambodia.
- Khun-inkeeree, H., Ahmad, A. A., & MohdSofian, F. N. R. (2018). The relationship between principals' instructional leadership and teachers' self efficacy in religious private school in Alor Setar District. *Rangsit Journal of Educational Studies, 5*(2), 52-63.
- Killion, J., & Bellamy, G. T. (2000). On the job. *Journal of Staff Development, 21*(1), 27-31.
- Kim, S., Raza, M., & Seidman, E. (2019). Improving 21st-century teaching skills: The key to effective 21st-century learners. *Research in Comparative and International Education, 14*(1), 99–117.
- Knezevich, S. J. (1984). *Administration of public education: A sourcebook for the leadership and management of educational institutions*. New York, NY: Harpercollins College Division.
- Korhonen, T., Lavonen, J., Kukkonen, M., Sormunen, K., & Juuti, K. (2014). *Finnish innovations and technologies in schools - Towards new ecosystem of learning*. Rotterdam, Netherlands: Sense.
- Lambert, L. (2003). Leadership redefined: An evocative context for teacher leadership. *School Leadership and Management, 23*(4), 421-430.
- Lasater, K., Albiladi, W. S., Davis, W. S., & Bengtson, E. (2020). The data culture continuum: An examination of school data cultures. *Educational Administration Quarterly, 56*(4), 533-569.

- Lashway, L. (2002). *Developing instructional leaders*. Eugene, OR: ERIC Clearinghouse on Educational Management.
- Lau, A. K. L., Chuk, K. C., & Wei So, W. K. (2002). Reflective practise in clinical teaching. *Nursing and Health Sciences*, 4(4), 201-208.
- Leithwood, K., & Beatty, B. (2007). *Leading with teacher emotions in mind*. Thousand Oaks, CA: Corwin Press.
- Leithwood, K., Harris, A., & Hopkins, D. (2008). Seven strong claims about successful school leadership. *School Leadership and Management*, 28(1), 27–42.
- Leithwood, K., Louis, K. S., Anderson, S., & Wahlstrom, K. (2004). *Learning from leadership: A review of the literature*. Minneapolis, MN: University of Minnesota, Center for Applied Research and Educational Improvement.
- Leithwood, K., Patten, S., & Jantzi, D. (2010). Testing a conception of how school leadership influences student learning. *Educational Administration Quarterly*, 46(5), 671–706.
- Leithwood, K., Seashore-Louis, K., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning (Learning from leadership project executive summary)*. New York, NY: The Wallace Foundation.
- Leonard, J. C. (2010). *Finding the time for instructional leadership: Management strategies for strengthening the academic program*. Lanham, MD: Rowman and Littlefield.
- Levine, D. (1982). Successful approaches for improving academic achievement in inner- city elementary schools. *Phi Delta Kappan*, 63(8), 523-526.
- Levine, D., & Stark, J. (1982). Instructional and organizational arrangements that improve student achievement in inner-city schools. *Educational Leadership*, 40(3), 41-46.
- Liang, Q., Niu, W., Cheng, L., & Qin, K. (2022). Creativity outside school: The influence of family background, perceived parenting, and after-school activity on creativity. *The Journal of Creative Behavior*, 56(1), 138-157.
- Light, A., Wexler, D. H., & Heinze, J. (2005). *Keeping teachers in the center: A framework of data-driven decision-making*. New York, NY: Center for Children and Technology.

- Liou, Y. H., Grigg, J., & Halverson, R. (2014). Leadership and the design of data-driven professional networks in schools. *International Journal of Educational Leadership and Management*, 2(1), 29–73.
- Little, J. W. (2012). Understanding data use practice among teachers: The contribution of micro-process studies. *American Journal of Education*, 118(2), 143–166.
- Littrell, P., Billingsley, B., & Cross, L. (1994). The effects of principal support on special and general educators' stress, job satisfaction, school commitment, health, and intent to stay in teaching. *Remedial and Special Education*, 15(5), 297-310.
- Liu, Y., Li, L., & Huang, C. (2022). To what extent is shared instructional leadership related to teacher self-efficacy and student academic performance in China? *School Effectiveness and School Improvement*, 33(3), 381-402.
- Louis, K. S., Dretzke, B., & Wahlstrom, K. (2010). How does leadership affect student achievement? Results from a national US survey. *School Effectiveness and School Improvement*, 21(3), 315–336.
- Louis, K. S., & Wahlstrom, K. (2011). Principals as cultural leaders. *Phi Delta Kappan*, 92(5), 52-56.
- Lorensius, L., Anggal, N., & Lugan, S. (2022). Academic supervision in the improvement of teachers' professional competencies: Effective practices on the emergence. *EduLine: Journal of Education and Learning Innovation*, 2(2), 99-107.
- Mahony, P., & Hextall, I. (2000). *Reconstructing teaching: Standards, performance and accountability*. New York, NY: Routledge Falmer.
- Maj, S. P. (2022). A Practical New 21st century learning theory for significantly improving STEM learning outcomes at all educational levels. *Eurasia Journal of Mathematics, Science and Technology Education*, 18(2), 1-11.
- Mandal, S. (2018). The competencies of the modern teacher. *International Journal of Research in Engineering, Science and Management*, 1(10), 351-360.
- Mandinach, E. B. (2012). A perfect time for data use: Using data-driven decision making to inform practice. *Educational Psychologist*, 47(2), 71–85.
- Marks, H. M., & Printy, S. M. (2003). Principal leadership and school performance: An integration of transformational and instructional leadership. *Educational Administration Quarterly*, 39(3), 370-397.

- Marsh, J. A., & Farrell, C. C. (2015). How leaders can support teachers with data-driven decision making: A framework for understanding capacity building. *Educational Management Administration and Leadership, 43*(2), 269-289.
- Masumoto, M., & Brown-Welty, S. (2009). Case study of leadership practices and school-community interrelationships in high-performing, high-poverty, rural California high schools. *Journal of Research in Rural Education (Online), 24*(1), 1-18.
- May, H., & Supovitz, J. A. (2011). The scope of principal efforts to improve instruction. *Educational Administration Quarterly, 47*(2), 332-352.
- McEwan, E. (2002). *Seven Steps to Effective Instructional Leadership*. California, CA: Corwin Press.
- McKnight, K., Graybeal, J., Yarbrow, J., & Graybeal, L. (2016). *The heart of great teaching: Pearson global survey of educator effectiveness*. New Jersey, NJ: Pearson Education.
- McLeod, G. (2003). Learning theory and instructional design. *Learning Matters, 2*(3), 35-43.
- Mercier, K., Simonton, K., Centeio, E., Barcelona, J., & Garn, A. (2023). Middle school students' attitudes toward physical activity and physical education, intentions, and physical activity behavior. *European Physical Education Review, 29*(1), 40-54.
- Miller, R., & Pedro, J. (2006). Creating respectful classroom environments. *Early Childhood Education Journal, 33*(5), 293-299.
- Ministry of Education, Youth and Sport. (2015). *Teacher policy action plan*. Phnom Penh, Cambodia: MoEYS.
- Ministry of Education, Youth and Sport. (2016). *Policy Guidelines for New Generation Schools for Basic Education in Cambodia*. Phnom Penh, Cambodia: MoEYS.
- Ministry of Education, Youth and Sport. (2016). *Mid-term review report in 2016 of the education strategic plan 2014-2018 and projection to 2020*. Phnom Penh, Cambodia: MoEYS.
- Ministry of Education, Youth and Sport. (2019). *New generation schools operational policy guidelines*. Phnom Penh, Cambodia: MoEYS.

- Ministry of Education, Youth and Sport. (2019). *Cambodia's Education 2030 Roadmap: Sustainable Development –Goal 4*. Phnom Penh, Cambodia: MoEYS.
- Mukaram, A. T., Rathore, K., Khan, M. A., Danish, R. Q., & Zubair, S. S. (2021). Can adaptive–academic leadership duo make universities ready for change? Evidence from higher education institutions in Pakistan in the light of COVID-19. *Management Research Review*, *44*(11), 1478-1498.
- Murphy, J. (1990). Principal instructional leadership. *Advances in Educational Administration*, *1*(Part B), 163-200.
- Murphy, J., & Hallinger, P. (1992). The principalship in an era of transformation. *Journal of Educational Administration*, *30*(3), 77–78.
- Murtedjo, S. (2018). The role of principal in optimizing school climate in primary schools. *Journal of Physics: Conference Series*, *9*(5), 121-179.
- Nessipbayeva, O. (2012). The competencies of the modern teacher. In Popov, N., Wolhuter, C., Leutwyler, B., Hilton, G., Ogunleye, G., & Almedia, P. A. (Eds.), *International perspectives on education: BCES conference books*. (pp. 148-154). Sofia, Bulgaria: Bulgarian Comparative Education Society.
- Newton, L. D., & Newton, D. P. (2014). Creativity in 21st century education. *Prospects*, *44*(4), 575-589.
- Obadara, N. O. (2005). A prospective longitudinal study of psychological predictors of achievement. *Journal of School Psychology*, *34*(3), 285 - 306.
- Odhiambo, G., & Hii, A. (2012). Key stakeholders' perceptions of effective school leadership. *Educational Management Administration and Leadership*, *40*(2), 232-247.
- Ogawa, R. T., & Bossert, S. T. (1995). Leadership as an organizational quality. *Educational Administration Quarterly*, *31*(2), 224-243.
- Okendu, J. N. (2012). The impact of school administrative structure and adequate supervision on the improvement of Instructional process. *Academic Research Journal*, *2*(3), 497-504.
- Osman, A., & Mukuna, T. E. (2013). Improving instructional leadership in schools through building principals' capacity. *Journal of Education and Practice*, *4*(2), 41–48.

- Pan, H. L. W., & Chen, W. Y. (2021). How principal leadership facilitates teacher learning through teacher leadership: Determining the critical path. *Educational Management Administration and Leadership*, 49(3), 454-470.
- Pan, H. L. W., Nyeu, F. Y., & Chen, J. S. (2015). Principal instructional leadership in Taiwan: Lessons from two decades of research. *Journal of Educational Administration*, 53(4), 492-511.
- Pan, H. L. W., Nyeu, F. Y., & Cheng, S. H. (2017). Leading school for learning: Principal practices in Taiwan. *Journal of Educational Administration*, 55(2), 168-185.
- Pantić, N., & Wubbels, T. (2010). Teacher competencies as a basis for teacher education: Views of Serbian teachers and teacher educators. *Teaching and Teacher Education*, 26(3), 694-703.
- Patterson, J., & Patterson, J. (2004). Sharing the lead. *Educational Leadership*, 61(7), 4-78.
- Petrides, L. A. & Guiney, S. Z. (2002). Knowledge management for school leaders: An ecological framework for thinking schools. *Teachers College Record*, 104(8), 1702-1717.
- Petrides, L. A. & Nodine, T. (2006). Crunching the numbers: Districts are collecting more data than ever, but are they using it to improve performance? *American School Board Journal*, 193(9), 42-46.
- Phaengbuppha, T., Choeybal, P., & Ksurimon, P. (2021). The Instructional leadership development guidelines for school administrators under the office of Udon Thani primary educational service area. *KKU Research Journal (Graduate Studies) Humanities and Social Sciences*, 9(1), 175-186.
- Popkewitz, T. S. (2004). The alchemy of mathematics curriculum: Inscriptions and the fabrication of the child. *American Educational Research Journal*, 41(1), 3-34.
- Pounder, D.G. (1999). Teacher teams: Exploring job characteristics and work related outcomes of work group enhancement. *Educational Administration Quarterly*, 35(3), 317-348.
- Prachakul, W., & Kulophas, D. (2021). A Study of 21st century teacher competencies of teachers in the schools under the Vibhavadi Joint Campus, the secondary education service area office 2, Bangkok. *An Online Journal of Education*, 16(2), 1-12.

- Prestine, N. A., & Nelson, B. S. (2005). *A new agenda: Directions for research on educational leadership*. New York, NY: Teachers College Press.
- Price, D. C., & Mansfield, K. C. (2021). Leadership in the time of COVID: Connecting community resources to meet the needs of north Carolina students. *Frontiers in Education*, 5(10), 1-8.
- Printy, S. M., & Marks, H. M. (2006). Shared leadership for teacher and student learning. *Theory into Practice*, 45(2), 125-132.
- Purkey, S. C., & Smith, M. S. (1983). Effective schools: A review. *The Elementary School Journal*, 83(4), 427-452.
- Rajoo, M., Balasubramaniam, G., Auliah, A., Shaharudin, S., & Efendi, R. (2022). The role of Malaysian mathematics teachers in promoting 21st century learning. *Journal of Positive School Psychology*, 6(4), 1310–1318.
- Reitzug, U. C., West, D. L., & Angel, R. (2008). Conceptualizing instructional leadership: The voices of principals. *Education and Urban Society*, 40(6), 694-714.
- Robinson, V. M. J. (2011). *Student-Centred Leadership*. San Francisco, CA: Jossey-Bass.
- Rwanda Education Board. (2019). *The National Teacher CPD Framework*. Rwanda.
- Saavedra, A. R., & Opfer, V. D. (2012). Learning 21st-century skills requires 21st century teaching. *Phi Delta Kappan*, 94(2), 8-13.
- Schildkamp, K., & Kuiper, W. (2010). Data-informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education*, 26(3), 482–496.
- Sfard, A. (1988). On two metaphors for learning and the dangers of choosing just one. *Educational Researcher*, 27(2), 4-13.
- Shaked, H., Glanz, J., & Gross, Z. (2018). Gender differences in instructional leadership: how male and female principals perform their instructional leadership role. *School Leadership and Management*, 38(4), 417-434.
- Sheppard, B. (1996). Exploring the transformational nature of instructional leadership. *The Alberta Journal of Educational Research*, 52(4), 325-344.
- Singh, C. K. S., Ong, E. T., Mohtar, T. M. T., Sing, R. S. M., & Mostafa, N. A. (2020). Quality teachers of the 21st century: An overview of theories and practice. *International Journal of Innovation, Creativity and Change*, 13(1), 1481-1494.

- Sireci, S. G. (1998). The construct of content validity. *Social Indicators Research*, 45(13), 83–117.
- Smith, W. F., & Andrews, R. L. (1989). *Instructional Leadership: How Principals Make a Difference*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Sontag, M. (2009). A learning theory for 21st-century students. *Innovate: Journal of Online Education*, 5(4), 1-8.
- Southeast Asian Minister of Education, Organization, Innovation and Technology (SEAMEO-INNOTECH). (2012). *Decentralization of educational management in Southeast Asia*. Bangkok, Thailand: SEAMEO-INNOTECH.
- Southeast Asian Minister of Education, Organization, Innovation and Technology, Southeast Asian Ministers of Education Organization & Teachers' Council of Thailand (SEAMEO-INNOTECH, SEAMEO, & TCT). (2018). *Southeast Asia Teachers Competency Framework*. Bangkok, Thailand: Teachers' Council of Thailand.
- Spillane, J., Halverson, R., & Diamond, J. (2001). Investigating school leadership practice: A distributed perspective. *Educational Researcher*, 30(3), 23–27.
- Stallings, J. (1980). Allocated academic learning time revisited, or beyond time on task. *Educational Researcher*, 9(11), 11-16.
- Staman, L. L., Timmermans, A. A., & Visscher, A. A. (2017). Effects of a data-based decision making intervention on student achievement. *Studies in Educational Evaluation*, 55(4), 58-67.
- Stronge, J. H., Richard, H. B & Catano, N. (2008). *Qualities of effective principals*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Suhardan, D. (2010). *Educational supervision*. Bandung: Mimbar Pendidikan.
- Sulaiman, J., & Ismail, S. N. (2020). Teacher competence and 21st century skills in transformation schools 2025 (TS25). *Universal Journal of Educational Research*, 8(8), 3536–3544.
- Sun, J., Przybylski, R., & Johnson, B. J. (2016). A review of research on teachers' use of student data: from the perspective of school leadership. *Educational Assessment, Evaluation and Accountability*, 28(1), 5-33.

- Sun, J., Johnson, B., & Przybylski, R. (2016). Leading with data: An increasingly important feature of school leadership. *International Studies in Educational Administration (Commonwealth Council for Educational Administration & Management)*, 44(3), 93-128.
- Suyudi, M., Rahmatullah, A. S., Rachmawati, Y., & Hariyati, N. (2022). The Effect of instructional leadership and creative teaching on student actualization: Student satisfaction as a mediator variable. *International Journal of Instruction*, 15(1), 113-134.
- Swan, K. (2008). Teaching with (digital) technology. *Current Issues in Teacher Education: History, Perspectives and Implications*, 8(2), 175-186.
- Tapani, A., & Salonen, A. O. (2019). Identifying teachers' competencies in Finnish vocational education. *International Journal for Research in Vocational Education and Training*, 6(3), 243–260.
- Tabroni, I., & Ismiati, I. (2021). School management strategies in improving the quality of education with leading programs based on Islamic boarding schools. *Soko Guru: Jurnal Ilmu Pendidikan*, 1(3), 1-4.
- Ten Dam, G., & Blom, S. (2006). Learning through participation: The potential of school-based teacher education for developing a professional identity. *Teaching and Teacher Education*, 22(6), 647-660.
- Tigelaar, D. E. H., Dolmans, D. H. J. M., Wolfhagen, I. H. A. P., & Vleuten, C. P. M. V. D. (2004). The development and validation of a framework for teaching competencies in higher education. *Higher Education*, 48(2), 253–268.
- Townsend, T. (2019). *Instructional leadership and leadership for learning in schools: Understanding theories of leading*. London, UK: Palgrave Macmillan.
- Tucker, M. S., & Coddling, J. B. (2003). *The principal challenge: Leading and managing schools in an era of accountability*. Hoboken, NJ: John Wiley & Sons.
- Ukeje, B.O. (1979). *Foundations of Education*. Benin, Nigeria: Ethiope Publishing Corporation.
- Van der Scheer, E. A., & Visscher, A. J. (2016). Effects of an intensive data-based decision making intervention on teacher efficacy. *Teaching and Teacher Education*, 60(4), 34–43

- Van Geel, M., Keuning, T., Visscher, A. J., & Fox, J. (2016). Assessing the effects of a schoolwide data-based decision-making intervention on student achievement growth in primary schools. *American Educational Research Journal*, 53(2), 360-394.
- Virgilio, S. J., & Virgilio, I. R. (1984). The role of the principal in curriculum implementation. *Education*, 104(4), 346-350.
- Weber, R. (1971). *Inner city children can be taught to read: Four successful schools*. Washington, DC: Council for Basic Education.
- Weber, J. (1996). Leading the instructional program. In S. Smith & P. Piele (Eds.), *School leadership*. (pp. 253-278). Eugene, Oregon: Clearinghouse of Educational Management.
- Weinert, F. E. (1999). *Concepts of competence*. Munich, Germany: Max Planck Institute for Psychological Research.
- White, S. H. (2011). *Beyond the numbers: Making data work for teachers and school leaders*. Englewood, CO: Lead and Learn Press.
- Wiles, J. (2008). *Leading curriculum development*. Thousand Oaks, CA: Corwin Press.
- Wiyono, B. B., Rasyad, A., & Maisyaroh. (2021). The Effect of collaborative supervision approaches and collegial supervision techniques on teacher intensity using performance-based learning. *Sage Open*, 11(2), 1-9.
- Wohlstetter, P., Datnow, A., & Park, V. (2008). Creating a system for data-driven decision making: Applying the principal-agent framework. *School Effectiveness and School Improvement*, 19(3), 239-259.
- Yamane, T. (1973). *Statistics: An Introductory Analysis*. New York, NY: Harper and Row.
- Yeo, S., Rutherford, T., & Campbell, T. (2022). Understanding elementary mathematics teachers' intention to use a digital game through the technology acceptance model. *Education and Information Technologies*, 27(8), 515-536.
- Ylimaki, R. M. (2014). *The new instructional leadership*. New York, NY: Routledge.
- Yoon, S. Y. (2016). Principals' data-driven practice and its influences on teacher buy-in and student achievement in comprehensive school reform models. *Leadership and Policy in Schools*, 15(4), 500-523.

APPENDICES

- 1. APPENDIX A RESEACRH INSTRUMENT**
- 2. APPENDIX B RELIABILITY AND ANALYSIS OF QUESTION**
- 3. APPENDIX C NAME LIST OF EXPERTS**
- 4. APPENDIX D COOPERATION LETTER**

APPENDIX A:
RESEACRH INSTRUMENT

Research Questionnaire (English Languages)



Research Questionnaire

Topic: The Effect of Principals' Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in the New Generation Schools in Cambodia.

Instruction

This research is part of Master of Educational Administration, Department of Education, Faculty of Education, Prince of Songkla University. This questionnaire is used to collect data for the study on “The Effect of Principals' Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in the New Generation Schools in Cambodia.”

This questionnaire consists of 3 sections as follows:

Section 1: Demographic data of respondents (Checklist).

Section 2: The principals' instructional leadership of NGS

Section 3: The 21st century teaching competencies of teachers in NGS.

The data obtained from the questionnaire is used to analyze *the effect of principals' instructional leadership on the 21st century teaching competencies as perceived by teachers in the New Generation Schools in Cambodia* with no effect the respondents or respondents' position.

Please kindly and honestly answer all the questions consistently. Thank you for your participation and cooperation.

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Questionnaire

Topic: “The Effect of Principals’ Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in the New Generation Schools in Cambodia”.

Section1: Demographic Data of Respondents

Instruction: Please tick (✓) in the box that is true for you and fill in the space as required:

Example:

0. Gender:

Female

Male

1. Gender:

Female

Male

2. Highest Education Qualification:

Doctoral Degree

Master’s degree

Bachelor’s degree

Associate degree

Other (specify)

3. Teaching subject of Teachers

Primary School Teachers

Khmer Literature others.....

Mathematics

English

Physics

Geography

Biology

History

Chemistry

Economic

Earth Science

Home Economics and Moral

4. Professional Working Experience (in current position)

Less than 5 years

5-10 years

More than 10 years

Section 2: To study the level of Principals' instructional leadership of New Generation Schools.

Please put a tick (✓) on the number that most closely matches the real practice of your school principal.

- 5 refers to** School principal practices at the highest level
4 refers to School principal practices at the high level
3 refers to School principal practices at the moderate level
2 refers to School principal practices at the low level
1 refers to School principal practices at the lowest level

** *Example*

N ^o	Instructional Leadership of School Principals	Level of Practicing				
		5	4	3	2	1
1.	Principals work with stakeholders to develop vision, mission, values, common goals and strategic plans for school development	5 ✓	4	3	2	1

Section 2: (Cont.)

No	Instructional Leadership of School Principals	Level of Practicing				
		5	4	3	2	1
Developing and Sustaining School Vision						
1.	Principals work with stakeholders to develop vision, mission, values, common goals and strategic plans for school development.	5	4	3	2	1
2.	Principals communicate vision, mission, values, common goals and strategic plans to create mutual understanding with stakeholders.	5	4	3	2	1
3.	Principals distribute clear tasks to school personnel to achieve the goals set out in the plan.	5	4	3	2	1
4.	Principals display their personal vision and serve as examples through their daily job.	5	4	3	2	1
5.	Principals have high expectations for students' academic performance.	5	4	3	2	1
Managing Curriculum and Instruction						
6.	Principals facilitate curriculum which aligns with school vision.	5	4	3	2	1
7.	Principals monitor the implementation of the curriculum.					
8.	Principals value the diversity of teachers' teaching strategies.	5	4	3	2	1
9.	Principals conduct research on the best teaching techniques to enhance successful teaching and learning.	5	4	3	2	1
10.	Principals provide the necessary resources for teachers to serve teaching and learning.	5	4	3	2	1

Section 2: (Cont.)

N ₀	Instructional Leadership of School Principals	Level of Practicing				
		5	4	3	2	1
Promoting School Learning Environment						
11.	Principals foster a safe, hygiene, and comfortable learning environment.	5	4	3	2	1
12.	Principals have high expectations in setting the school standard.	5	4	3	2	1
13.	Principals promote a harmonious culture in the workplace.	5	4	3	2	1
14.	Principals encourage teachers to participate in professional development activities.	5	4	3	2	1
15.	Principals encourage teachers to analyze student learning outcomes to develop student' performance.	5	4	3	2	1
16.	Principals encourage lifelong learning in school by providing equipment and multiple learning resources for teachers and students.	5	4	3	2	1
Supervising Teaching and Learning Process						
17.	Principals make time to visit the classroom.	5	4	3	2	1
18.	Principals provide feedback to teachers in order to improve teaching methods.	5	4	3	2	1
19.	Principal apply appropriate models to supervision and evaluation on teachers' performance.	5	4	3	2	1
20.	Principals respect the expression of teachers.	5	4	3	2	1
21.	Principals keep an eye on the students' academic progress.	5	4	3	2	1

Section 2: (Con't)

N ₀	Instructional Leadership of School Principals	Level of Practicing				
		5	4	3	2	1
Driving Data to Make Instructional Decision						
22.	Principals use the past data such as the standardized test scores, attendance data, and behavior data as a baseline to find way to improve students' performance in the future.	5	4	3	2	1
23.	Principals use the past data as baseline data to evaluate teachers' performance.	5	4	3	2	1
24.	The principals analyze the school data first before he or she decides to develop any areas of the school.	5	4	3	2	1
25.	Principals regularly evaluate the results of the work in deciding how to solve the problem.					
26.	Principals award the excellent teachers or students based on the proper evidence of data being collected.	5	4	3	2	1
Sharing Leadership						
27.	Principals respect and encourage teachers to participate in decision making.	5	4	3	2	1
28.	Principals support and provide meaningful opportunities for teachers to become leaders.	5	4	3	2	1
29.	Principals show exemplary leadership to teachers.	5	4	3	2	1
30.	Principals build a school environment that supports teacher leadership.	5	4	3	2	1

Section 3: To investigate the level of the 21st century teaching competencies as perceived by teachers in the New Generation Schools.

Please put a tick (✓) on the number that most closely matches the real practice of teachers at New Generation Schools.

- 5 refers to** NGS Teachers practice at the highest level
4 refers to NGS Teachers practice at the high level
3 refers to NGS Teachers practice at the moderate level
2 refers to NGS Teachers practice at the low level
1 refers to NGS Teachers practice at the lowest level

** *Example*

N ^o	Teachers' 21 st Century Teaching Competencies	Level of Practicing				
		5	4	3	2	1
1.	I have demonstrated leadership in the school by participating in school development activities with other school personnel.	5 ✓	4	3	2	1

Section3: (Cont.)

N ₀	Teachers' 21 st Century Teaching Competencies	Level of practicing				
		5	4	3	2	1
Exercising Teacher Leadership						
1.	I have demonstrated leadership by participating in school development activities with other school personnel.	5	4	3	2	1
2.	I lead the class effectively by setting clear teaching objectives.	5	4	3	2	1
3.	I know how to select, create, modify, and manage digital educational resources.	5	4	3	2	1
4.	I acknowledge educational policies and how they affect the instruction.	5	4	3	2	1
Comprehending Subject Contents						
5.	I understand about the philosophy and significant objective of the curriculum.	5	4	3	2	1
6.	I understand clearly about the subject contents that I will teach.	5	4	3	2	1
7.	I have designed each lesson by linking with new knowledge in today's society.	5	4	3	2	1
8.	I constantly develop myself by participating in training sessions or by reading books, doing self-study related to the latest educational trends.	5	4	3	2	1
Teaching Pedagogy						
9.	I use new teaching methods (such as IBL, PBL, Flipped Classroom, etc.) tailored to each lesson objective.	5	4	3	2	1
10.	I design lessons plan with precise learning objectives which best match with students' background.	5	4	3	2	1

Section3: (Cont.)

N ₀	Teachers' 21 st Century Teaching Competencies	Level of practicing				
		5	4	3	2	1
Teaching Pedagogy						
11.	I develop a plan to evaluate students' assessment in order to find ways to motivate and support student better learning.	5	4	3	2	1
12.	I monitor students' progress by providing appropriate support, feedback, and encouragement to students.	5	4	3	2	1
Establishing a Positive Learning Environment						
13.	I set up a clean, safe and inspiring learning environment for students to learn.	5	4	3	2	1
14.	I provide learning spaces that allow students to speak with confidence and learn to mutually respect each other.	5	4	3	2	1
15.	I organize learning activities both inside and outside of the classroom.	5	4	3	2	1
16.	I use instructional tools to help students learn.	5	4	3	2	1
Engaging with Parents and Community						
17.	I have built a good relationship with students' parents and community and all other stakeholders.	5	4	3	2	1
18.	I have organized learning activities using local resources, local wisdom and traditions.	5	4	3	2	1
19.	I collaborate with students' parents or guardians by inviting them to participate in their children's learning activities at school.	5	4	3	2	1
20.	I value the diversity of culture in school.	5	4	3	2	1

Section3: (Cont.)

N ₀	Teachers' 21 st Century Teaching Competencies	Level of practicing				
		5	4	3	2	1
Inspiring Students in Learning						
21.	I identify students' needs and background such as interest, problem, strength, and weakness in order to find ways to help them learn better.	5	4	3	2	1
22.	I observe the ways that students learn and support them with unique learning needs.	5	4	3	2	1
23.	I prepare interesting and easy-to-understand lessons for students.	5	4	3	2	1
24.	I design learning activities which enable students to use digital technology in their learning process.					
Digital Competencies						
25.	I have used technology in teaching and learning process.	5	4	3	2	1
26.	I use Simulation/Digital Game-Based Learning in teaching and learning process.	5	4	3	2	1
27.	I acknowledge cyber security.	5	4	3	2	1
28.	I explain students about the risk of cyber security.	5	4	3	2	1
Reflecting Professional Practice						
29.	I am well aware of my identity and professional ability.	5	4	3	2	1
30.	I reflect on my teaching on my own and with colleagues to find ways to improve teaching more effectively.	5	4	3	2	1
31.	I strive to fulfill my work.	5	4	3	2	1
32.	I set clear goals to improve my abilities.	5	4	3	2	1

Thank You For Your Cooperation

Research Question (Cambodian Languages)



ប្រធានបទ: ឥទ្ធិពលនៃភាពជាអ្នកដឹកនាំការបង្រៀន-រៀន របស់នាយកសាលាទៅលើសមត្ថភាពបង្រៀន តាមបែបសតវត្សរ៍ទី២១របស់គ្រូបង្រៀននៅក្នុងសាលារៀនជំនាន់ថ្មីនៃប្រទេសកម្ពុជា។

ការណែនាំ

ការស្រាវជ្រាវនេះគឺជាផ្នែកមួយនៃការបញ្ចប់ថ្នាក់បរិញ្ញាបត្រជាន់ខ្ពស់ផ្នែកគ្រប់គ្រងនិងរដ្ឋបាលអប់រំ នៃដេប៉ាតឺម៉ង់អប់រំនៃសកលវិទ្យាល័យសុងខ្នាណាក់ខារីន (PSU)។

កម្រងសំណួរនេះត្រូវបានរៀបចំឡើងដើម្បីប្រមូលទិន្នន័យទាក់ទងទៅនឹងឥទ្ធិពលនៃភាពជាអ្នក ដឹកនាំការបង្រៀន-រៀន របស់នាយកសាលាទៅលើសមត្ថភាពបង្រៀនតាមបែបសតវត្សរ៍ទី២១របស់គ្រូ បង្រៀននៅក្នុងសាលារៀនជំនាន់ថ្មីនៃប្រទេសកម្ពុជា។

កម្រងសំណួរនេះចែកចេញជា៣ផ្នែក៖

ផ្នែកទី១ ៖ ទិន្នន័យផ្ទាល់ខ្លួនរបស់អ្នកបំពេញកម្រងសំណួរ

ផ្នែកទី២ ៖ កម្រិតសមត្ថភាពនៃភាពជាអ្នកដឹកនាំការបង្រៀន-រៀនរបស់នាយកសាលា

ផ្នែកទី៣ ៖ កម្រិតសមត្ថភាពនៃការបង្រៀនតាមបែបសតវត្សរ៍ទី២១របស់គ្រូបង្រៀន

ទិន្នន័យដែលទទួលបានមកពីកម្រងសំណួរនេះនិងត្រូវបានប្រើដើម្បីវិភាគទិដ្ឋភាពទូទៅនៃឥទ្ធិពល ភាពជាអ្នកដឹកនាំការបង្រៀន-រៀន របស់នាយកសាលាទៅលើសមត្ថភាពបង្រៀនតាមបែបសតវត្សរ៍ទី២១ របស់គ្រូបង្រៀននៅក្នុងសាលារៀនជំនាន់ថ្មីនៃប្រទេសកម្ពុជា។ គ្រប់ព័ត៌មានដែលលោកគ្រូ អ្នកគ្រូបានផ្តល់ឲ្យ និងមិនបង្កផលប៉ះពាល់ដល់មុខតំណែងឬកិច្ចការងារផ្សេងៗរបស់លោកគ្រូ អ្នកគ្រូនោះទេ។ សូមគោរពអរ គុណចំពោះការចូលរួម និងកិច្ចសហប្រតិបត្តិការរបស់លោកគ្រូ អ្នកគ្រូ។

កញ្ញា ផល សុមាធីតា
និស្សិតបរិញ្ញាបត្រជាន់ខ្ពស់ផ្នែកគ្រប់គ្រងនិងរដ្ឋបាលអប់រំ
សកលវិទ្យាល័យសុងខ្នាណាក់ខារីន (PSU)
លេខទូរស័ព្ទ (+66) 0623493288/ (+855) 089 202 283
អ៊ីម៉ែល Somachita@gmail.com

កម្រងសំណួរសម្រាប់ការស្រាវជ្រាវ

ប្រធានបទ: ឥទ្ធិពលនៃភាពជាអ្នកដឹកនាំការបង្រៀន-រៀន របស់នាយកសាលាទៅលើសមត្ថភាពបង្រៀន តាមបែបសតវត្សរ៍ទី២១របស់គ្រូបង្រៀននៅក្នុងសាលារៀនជំនាន់ថ្មីនៃប្រទេសកម្ពុជា។

ផ្នែកទី១ ៖ ទិន្នន័យផ្ទាល់ខ្លួនរបស់អ្នកបំពេញកម្រងសំណួរ (សូមគូសសញ្ញា ✓ ក្នុងប្រអប់ ឬបំពេញចន្លោះ តាមភាពជាក់ស្តែងរបស់លោកគ្រូ អ្នកគ្រូ។)

ឧទាហរណ៍៖ ០. ភេទ <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <input checked="" type="checkbox"/> ស្រី <input type="checkbox"/> ប្រុស </div>
--

1. ភេទ

ស្រី
 ប្រុស
2. កម្រិតវប្បធម៌

បណ្ឌិត
 បរិញ្ញាបត្រជាន់ខ្ពស់
 បរិញ្ញាបត្រ
 បរិញ្ញាបត្ររង
 ផ្សេងៗ (បញ្ជាក់)
3. បង្រៀនមុខវិជ្ជា

គ្រូបឋមសិក្សា
 ភាសារខ្មែរ
 គេហកិច្ច
 គណិត
 ភាសាអង់គ្លេស
 បច្ចេកវិទ្យាទំនាក់ទំនងព័ត៌មាន
 រូបវិទ្យា
 ភូមិវិទ្យា
 អប់រំកាយនិងកីឡា
 ជីវវិទ្យា
 ប្រវត្តិវិទ្យា
 សិល្បៈ
 គីមីវិទ្យា
 សេដ្ឋកិច្ច
 ផ្សេងៗ (បញ្ជាក់).....
 ផែនដីវិទ្យា-បរិស្ថាន
 សីលធម៌-ពលរដ្ឋវិទ្យា
4. រយៈពេលបម្រើការងារក្នុងមុខតំណែងបច្ចុប្បន្ន

តិចជាង៥ឆ្នាំ
 ៥-១០ឆ្នាំ
 ច្រើនជាង១០ឆ្នាំ

ផ្នែកទី២៖ កម្រិតសមត្ថភាពនៃភាពជាអ្នកដឹកនាំការបង្រៀន-រៀនរបស់នាយកសាលានៃសាលារៀនជំនាន់ថ្មី។
 សូមលោកគ្រូ អ្នកគ្រូគូសសញ្ញា ✓ ក្នុងខ្ទង់ ដែលបញ្ជាក់ពីកម្រិតសមត្ថភាពនៃភាពជាអ្នកដឹកនាំ
 ការបង្រៀន-រៀន របស់នាយកសាលារបស់លោកគ្រូ អ្នកគ្រូ។

- 5 សំដៅលើអ្នកមើលឃើញថានាយកសាលារបស់អ្នកអនុវត្តចំណុចនោះបានច្រើនបំផុត
- 4 សំដៅលើអ្នកមើលឃើញថានាយកសាលារបស់អ្នកអនុវត្តចំណុចនោះបានច្រើន
- 3 សំដៅលើអ្នកមើលឃើញថានាយកសាលារបស់អ្នកអនុវត្តចំណុចនោះបានមធ្យម
- 2 សំដៅលើអ្នកមើលឃើញថានាយកសាលារបស់អ្នកអនុវត្តចំណុចនោះបានតិចតួច
- 1 សំដៅលើអ្នកមើលឃើញថានាយកសាលារបស់អ្នកអនុវត្តចំណុចនោះបានតិចតួចបំផុត

*** ឧទាហរណ៍

ល.រ	ភាពជាអ្នកដឹកនាំការបង្រៀន-រៀនរបស់ នាយកសាលា	កម្រិតអនុវត្ត				
		ច្រើន បំផុត	ច្រើន	មធ្យម	តិចតួច	តិចតួច បំផុត
		(5)	(4)	(3)	(2)	(1)
1.	នាយកសាលាបានធ្វើការជាមួយអ្នកពាក់ព័ន្ធ ដើម្បីអភិវឌ្ឍចក្ខុវិស័យ បេសកកម្ម គុណ តម្លៃ គោលដៅរួមនិងផែនការយុទ្ធសាស្ត្រ ដើម្បីអភិវឌ្ឍសាលារៀន។	5 ✓	4	3	2	1

** បញ្ជាក់៖ សូមប្រើសរសេរសត្វស(✓) ក្នុងខ្ទង់តែមួយគត់ដែលលោកគ្រូ អ្នកគ្រូគិតថាត្រឹមត្រូវបំផុត។

ផ្នែកទី២៖

ល.រ	ភាពជាអ្នកដឹកនាំការបង្រៀន-រៀនរបស់នាយកសាលា	កម្រិតអនុវត្ត				
		ច្រើនបំផុត	ច្រើន	មធ្យម	តិចតួច	តិចតួចបំផុត
		(5)	(4)	(3)	(2)	(1)
1.	នាយកសាលាបានធ្វើការជាមួយភាគីពាក់ព័ន្ធដើម្បីអភិវឌ្ឍចក្ខុវិស័យ បេសកកម្ម គុណតម្លៃ គោលដៅរួមនិងផែនការយុទ្ធសាស្ត្ររបស់សាលារៀន។	5	4	3	2	1
2.	នាយកសាលាបានតម្រង់ទិសនិងផ្សព្វផ្សាយអំពីចក្ខុវិស័យ បេសកកម្ម គុណតម្លៃ គោលដៅរួម និងផែនការយុទ្ធសាស្ត្ររបស់សាលារៀនដល់ភាគីពាក់ព័ន្ធទាំងអស់ដូចជា លោកគ្រូ អ្នកគ្រូ អាណាព្យាបាលសិស្ស...ល។	5	4	3	2	1
3.	នាយកសាលាបានប្រជុំធ្វើបំណែងចែកភារកិច្ចដើម្បីសម្រេចគោលដៅដែលបានកំណត់ទុកក្នុងផែនការ។	5	4	3	2	1
4.	នាយកសាលាបានបង្ហាញចក្ខុវិស័យផ្ទាល់ខ្លួននិងភាពជាគំរូតាមរយៈការងារប្រចាំថ្ងៃ។	5	4	3	2	1
5.	នាយកសាលារំពឹងទុកខ្ពស់លើលទ្ធផលសិក្សារបស់សិស្ស។	5	4	3	2	1
6.	នាយកសាលាបានជួយសម្របសម្រួលផ្នែកកម្មវិធីសិក្សាឲ្យស្របតាមចក្ខុវិស័យរបស់សាលារៀន។	5	4	3	2	1
7.	នាយកសាលាបានយកចិត្តទុកដាក់តាមដានទៅលើការអនុវត្តកម្មវិធីសិក្សា។	5	4	3	2	1
8.	នាយកសាលាបានផ្តល់តម្លៃទៅលើពិពិធភាព (ឬភាពចម្រុះ)នៃការបង្រៀនរបស់លោកគ្រូអ្នកគ្រូ។	5	4	3	2	1
9.	នាយកសាលាបានស្រាវជ្រាវពីវិធីសាស្ត្របង្រៀនដែលល្អបំផុតក្នុងការជំរុញដល់ប្រសិទ្ធភាពការបង្រៀននិងរៀន។	5	4	3	2	1
10.	នាយកសាលាបានផ្តល់ធនធានចាំបាច់ដល់លោកគ្រូអ្នកគ្រូសម្រាប់បម្រើឲ្យការបង្រៀននិងរៀន។	5	4	3	2	1

ផ្នែកទី២៖

ល.រ	ភាពជាអ្នកដឹកនាំការបង្រៀន-រៀនរបស់នាយកសាលា	កម្រិតអនុវត្ត				
		ច្រើនបំផុត	ច្រើន	មធ្យម	តិចតួច	តិចតួចបំផុត
		(5)	(4)	(3)	(2)	(1)
11.	នាយកសាលាជំរុញឲ្យមានបរិយាកាសសិក្សាប្រកបបដោយសុវត្ថិភាព អនាម័យ និង សុខុមាលភាព។	5	4	3	2	1
12.	នាយកសាលារំពឹងទុកខ្ពស់ក្នុងការបង្កើតស្តង់ដារសម្រាប់ការអភិវឌ្ឍសាលារៀន។	5	4	3	2	1
13.	នាយកសាលាបានលើកស្ទួយវប្បធម៌នៃភាពសុខដុមរមនានៅកន្លែងធ្វើការ។	5	4	3	2	1
14.	នាយកសាលាបានលើកទឹកចិត្តគ្រូបង្រៀនឲ្យចូលរួមក្នុងសកកម្មភាពអភិវឌ្ឍវិជ្ជាជីវៈ។	5	4	3	2	1
15.	នាយកសាលាបានលើកទឹកចិត្តគ្រូបង្រៀនឲ្យពិនិត្យលទ្ធផលសិក្សារបស់សិស្សជាប្រចាំដើម្បីស្វែងរកវិធីសាស្ត្រជួយជំរុញដល់ការអភិវឌ្ឍសមត្ថភាពរបស់សិស្ស។	5	4	3	2	1
16.	នាយកសាលាបានលើកទឹកចិត្តដល់ការសិក្សាពេញមួយជីវិតនៅក្នុងសាលា ដោយផ្តល់ការផ្គត់ផ្គង់ សម្ភារៈ និងធនធានសម្រាប់ការសិក្សាផ្សេងៗដល់គ្រូបង្រៀន និងសិស្ស។	5	4	3	2	1
17.	នាយកសាលាបានចំណាយពេលចុះសង្កេតថ្នាក់រៀន។	5	4	3	2	1
18.	នាយកសាលាបានផ្តល់មតិកែលម្អដល់គ្រូបង្រៀនដើម្បីអភិវឌ្ឍវិធីសាស្ត្របង្រៀន។	5	4	3	2	1
19.	នាយកសាលាបានប្រើប្រាស់ស្តង់ដារសមរម្យនិងច្បាស់លាស់ដើម្បីត្រួតពិនិត្យនិងវាយតម្លៃការងាររបស់គ្រូ។	5	4	3	2	1
20.	នាយកសាលាបានផ្តល់តម្លៃដល់ការបញ្ចេញមតិយោបល់របស់លោកគ្រូអ្នកគ្រូ។	5	4	3	2	1

ផ្នែកទី២៖

ល.រ	ភាពជាអ្នកដឹកនាំការបង្រៀន-រៀនរបស់នាយកសាលា	កម្រិតអនុវត្ត				
		ច្រើនបំផុត	ច្រើន	មធ្យម	តិចតួច	តិចតួចបំផុត
		(5)	(4)	(3)	(2)	(1)
21.	នាយកសាលាបានតាមដានលទ្ធផលសិក្សារបស់សិស្ស។	5	4	3	2	1
22.	នាយកសាលាបានជម្រុញគ្រូបង្រៀនឲ្យវិភាគទិន្នន័យក្នុងឆ្នាំចាស់ដូចជាពិន្ទុតេស្តស្តង់ដារ ទិន្នន័យវត្តមាននិងទិន្នន័យអាកប្បកិរិយាឬវិន័យរបស់សិស្សដើម្បីស្វែងរកវិធីកែលម្អការអភិវឌ្ឍរបស់សិស្សនាពេលអនាគត។	5	4	3	2	1
23.	នាយកសាលាបានប្រើទិន្នន័យពីឆ្នាំចាស់ជាទិន្នន័យមូលដ្ឋានដើម្បីវាយតម្លៃការអនុវត្តការងាររបស់គ្រូបង្រៀន។	5	4	3	2	1
24.	នាយកសាលាបានវិភាគទិន្នន័យរបស់សាលាជាមុនមុនពេលសម្រេចចិត្តអភិវឌ្ឍផ្នែកណាមួយនៅក្នុងសាលា។	5	4	3	2	1
25.	នាយកសាលាបានវាយតម្លៃលទ្ធផលការងារជាប្រចាំក្នុងការសម្រេចចិត្តលើការដោះស្រាយបញ្ហាដែលកើតឡើង។	5	4	3	2	1
26.	នាយកសាលាបានផ្តល់រង្វាន់ដល់គ្រូ ឬសិស្សឆ្នើមដោយផ្អែកទៅលើភស្តុតាងត្រឹមត្រូវ។	5	4	3	2	1
27.	នាយកសាលាគោរពនិងលើកទឹកចិត្តគ្រូបង្រៀនឲ្យចូលរួមចំណែកក្នុងការសម្រេចចិត្ត។	5	4	3	2	1
28.	នាយកសាលាគាំទ្រ និងផ្តល់ឱកាសល្អៗសម្រាប់គ្រូបង្រៀនដើម្បីក្លាយជាអ្នកដឹកនាំ។	5	4	3	2	1
29.	នាយកសាលាបានបង្ហាញភាពជាអ្នកដឹកនាំគម្រូដល់លោកគ្រូអ្នកគ្រូ។	5	4	3	2	1
30.	នាយកសាលាបានកសាងបរិយាកាសសាលារៀនដែលគាំទ្រភាពជាអ្នកដឹកនាំរបស់គ្រូបង្រៀន។	5	4	3	2	1

ផ្នែកទី៣៖ កម្រិតសមត្ថភាពនៃការបង្រៀនតាមបែបសតវត្សទី២១របស់គ្រូបង្រៀនសាលារៀនជំនាន់ថ្មី

សូមលោកគ្រូ អ្នកគ្រូគូសសញ្ញា ✓ ក្នុងខ្ទង់ ដែលលោកគ្រូ អ្នកគ្រូគិតថាត្រឹមត្រូវបំផុតចំពោះកម្រិតសមត្ថភាពការបង្រៀនបែបសតវត្សទី២១ របស់គ្រូបង្រៀននៅក្នុងសាលារៀនជំនាន់ថ្មី ។

- 5 មានន័យថា គ្រូបង្រៀននៅសាលារៀនជំនាន់ថ្មីធ្វើបាន ច្រើនបំផុត
- 4 មានន័យថា គ្រូបង្រៀននៅសាលារៀនជំនាន់ថ្មីធ្វើបាន ច្រើន
- 3 មានន័យថា គ្រូបង្រៀននៅសាលារៀនជំនាន់ថ្មីធ្វើបាន មធ្យម
- 2 មានន័យថា គ្រូបង្រៀននៅសាលារៀនជំនាន់ថ្មីធ្វើបាន តិចតួច
- 1 មានន័យថា គ្រូបង្រៀននៅសាលារៀនជំនាន់ថ្មីធ្វើបាន តិចតួចបំផុត

*** ឧទាហរណ៍

ល.រ	សមត្ថភាពនៃការបង្រៀនតាមបែបសតវត្សទី២១របស់គ្រូបង្រៀន	កម្រិតអនុវត្ត				
		ច្រើនបំផុត	ច្រើន	មធ្យម	តិចតួច	តិចតួចបំផុត
		(5)	(4)	(3)	(2)	(1)
1.	ខ្ញុំបានបង្ហាញពីភាពជាអ្នកដឹកនាំនៅក្នុងសាលារៀនតាមរយៈការចូលរួមក្នុងសកម្មភាពអភិវឌ្ឍន៍សាលារៀនរួមគ្នា។	5 ✓	4	3	2	1

** បញ្ជាក់៖ សូមជ្រើសរើសតួស(✓)ក្នុងខ្ទង់តែមួយគត់ដែលលោកគ្រូ អ្នកគ្រូគិតថាត្រឹមត្រូវបំផុត។

ផ្នែកទី៣៖

ល.រ	សមត្ថភាពនៃការបង្រៀនតាមបែបសកលវិទ្យាល័យ របស់គ្រូបង្រៀន	កម្រិតអនុវត្ត				
		ច្រើន បំផុត (5)	ច្រើន (4)	មធ្យម (3)	តិចតួច (2)	តិចតួច បំផុត (1)
1.	ខ្ញុំបានបង្ហាញពីភាពជាអ្នកដឹកនាំនៅក្នុងសាលា រៀនតាមរយៈការចូលរួមក្នុងសកម្មភាពអភិវឌ្ឍន៍ សាលារៀនរួមគ្នា។	5	4	3	2	1
2.	ខ្ញុំបានដឹកនាំថ្នាក់រៀនប្រកបដោយប្រសិទ្ធភាពតាម រយៈការកំណត់គោលបំណងនៃការបង្រៀនបាន ច្បាស់លាស់។	5	4	3	2	1
3.	ខ្ញុំបានចែករំលែកជំនាញនិងចំណេះដឹងដែលខ្ញុំ មានទៅកាន់មិត្តរួមការងារ (ឧ. ការបង្រៀនដោយ ប្រើបច្ចេកវិទ្យា, វិធីសាស្ត្របង្រៀន, ជំនាញឯក ទេស...ល។)	5	4	3	2	1
4.	ខ្ញុំយល់ដឹងអំពីគោលនយោបាយអប់រំ និងឥទ្ធិពល របស់វាទៅលើការបង្រៀន។	5	4	3	2	1
5.	ខ្ញុំយល់ដឹងពីទស្សនវិជ្ជា និងវត្ថុបំណងនៃកម្មវិធី សិក្សា។	5	4	3	2	1
6.	ខ្ញុំយល់ច្បាស់អំពីខ្លឹមសារមុខវិជ្ជាដែលខ្ញុំនឹងបង្រៀ ន។	5	4	3	2	1
7.	ខ្ញុំបានរៀបចំមេរៀននីមួយៗ ដោយផ្សាភ្ជាប់ជាមួយ និងចំណេះដឹងថ្មីៗនៅក្នុងសង្គមបច្ចុប្បន្ន។	5	4	3	2	1
8.	ខ្ញុំអភិវឌ្ឍខ្លួនយ៉ាងជាប់លាប់ ដោយចូលរួមក្នុងវគ្គប ណ្តុះបណ្តាលនានា ឬតាមរយៈការអានសៀវភៅ ការធ្វើស្វ័យសិក្សាដែលពាក់ព័ន្ធនឹងនិន្នាការនៃការ អប់រំថ្មីៗ។	5	4	3	2	1

ផ្នែកទី៣៖

ល.រ	សមត្ថភាពនៃការបង្រៀនតាមបែបសកម្មភាព១ របស់គ្រូបង្រៀន	កម្រិតអនុវត្ត				
		ប្រើន បំផុត (5)	ប្រើន (4)	មធ្យម (3)	តិចតួច (2)	តិចតួច បំផុត (1)
9.	ខ្ញុំបានប្រើប្រាស់វិធីសាស្ត្របង្រៀនថ្មីៗ(ដូចជា ការសិក្សាបែបរុករក, ការសិក្សាដោះស្រាយបញ្ហា, Active Learning, Flipped Classroom ជាដើម) ដែលតម្រូវទៅតាមវត្ថុបំណងមេរៀននីមួយៗ។	5	4	3	2	1
10.	ខ្ញុំបានរៀបចំកិច្ចតែងការបង្រៀនដែលមានវត្ថុបំណងមេរៀនច្បាស់លាស់និងសមស្របជាមួយកម្រិតចំណេះដឹងរបស់សិស្ស។	5	4	3	2	1
11.	ខ្ញុំបានវាយតម្លៃទៅលើសមត្ថភាពសិក្សារបស់សិស្សដើម្បីស្វែងរកវិធីសាស្ត្រជួយជំរុញដល់ការរៀននិងបង្រៀន។	5	4	3	2	1
12.	ខ្ញុំបានផ្តល់ការគាំទ្រ មតិកែលម្អ និងការលើកទឹកចិត្តដល់សិស្ស ដើម្បីឱ្យសិស្សបន្តអភិវឌ្ឍសមត្ថភាពរបស់ពួកគេ។	5	4	3	2	1
13.	ខ្ញុំបានរៀបចំកន្លែងសិក្សាដែលប្រកបទៅដោយអនាម័យ សុវត្ថិភាពនិងជាទីជម្រុញចិត្តសិស្សឱ្យចង់រៀន។	5	4	3	2	1
14.	ខ្ញុំបានលើកទឹកចិត្តឱ្យសិស្សបញ្ចេញមតិយោបល់យ៉ាងមានទំនុកចិត្ត និងចេះគោរពគ្នាទៅវិញទៅមក។	5	4	3	2	1
15.	ខ្ញុំបានបង្កើតសកម្មភាពសិក្សាទាំងក្នុង និងក្រៅថ្នាក់រៀន។	5	4	3	2	1
16.	ខ្ញុំបានប្រើប្រាស់សម្ភារៈឧបទ្វេសដែលជំនួយដល់ការសិក្សារបស់សិស្ស។	5	4	3	2	1

ផ្នែកទី៣៖

ល.រ	សមត្ថភាពនៃការបង្រៀនតាមបែបសកលវិទ្យាល័យ របស់គ្រូបង្រៀន	កម្រិតអនុវត្ត				
		ច្រើន បំផុត (5)	ច្រើន (4)	មធ្យម (3)	តិចតួច (2)	តិចតួច បំផុត (1)
17.	ខ្ញុំបានបង្កើតទំនាក់ទំនងល្អជាមួយឪពុកម្តាយសិស្ស សហគមន៍ និង អ្នកពាក់ព័ន្ធទាំងអស់។	5	4	3	2	1
18.	ខ្ញុំបានរៀបចំសកម្មភាពសិក្សាដោយប្រើប្រាស់ធនធានក្នុងសហគមន៍ ចំណេះដឹងនិងប្រពៃណីក្នុងតំបន់។	5	4	3	2	1
19.	ខ្ញុំបានសហការជាមួយមាតាបិតារបស់សិស្ស ដើម្បីជួយជំរុញឲ្យការសិក្សាកូនៗរបស់គាត់កាន់តែមានភាពប្រសើរឡើង។	5	4	3	2	1
20.	ខ្ញុំផ្តល់តម្លៃចំពោះភាពចម្រុះនៃវប្បធម៌ដែលមាននៅក្នុងសាលារៀន។	5	4	3	2	1
21.	ខ្ញុំបានស្វែងយល់ពីតម្រូវការនិងព័ត៌មានមូលដ្ឋានរបស់សិស្ស ដូចជាចំណាប់អារម្មណ៍ ភាពខ្លាំង និងភាពខ្សោយ ព្រមទាំងបញ្ហាផ្សេងៗ របស់សិស្ស ដើម្បីស្វែងរកវិធីជួយពួកគេឱ្យរៀនកាន់តែប្រសើរ	5	4	3	2	1
22.	ខ្ញុំបានសង្កេតមើលពីរបៀបរៀនរបស់សិស្ស ដើម្បីផ្តល់ការគាំទ្រឲ្យសមស្របទៅនឹងតម្រូវការនៃរបៀបរៀនសូត្ររបស់ពួកគេ។	5	4	3	2	1
23.	ខ្ញុំបានរៀបចំមេរៀនដែលគួរឱ្យចាប់អារម្មណ៍ និងងាយស្រួលយល់សម្រាប់សិស្ស។	5	4	3	2	1
24.	ខ្ញុំបានរៀបចំសកម្មភាពសិក្សាដែលអាចឱ្យសិស្សប្រើប្រាស់បច្ចេកវិទ្យាឌីជីថលក្នុងដំណើរការរៀនរបស់ពួកគេ។	5	4	3	2	1

ផ្នែកទី៣៖

ល.រ	សមត្ថភាពនៃការបង្រៀនតាមបែបសតវត្សទី២១ របស់គ្រូបង្រៀន	កម្រិតអនុវត្ត				
		ប្រើន បំផុត (5)	ប្រើន (4)	មធ្យម (3)	តិចតួច (2)	តិចតួច បំផុត (1)
25.	ខ្ញុំបានប្រើប្រាស់បច្ចេកវិទ្យាក្នុងការបង្រៀននិងរៀន	5	4	3	2	1
26.	ខ្ញុំបានប្រើប្រាស់ឌីជីថលហ្គេមឬល្បែងសិក្សា (Simualtion/ Digital Game-Based Learning) ក្នុងការបង្រៀននិងរៀន។	5	4	3	2	1
27.	ខ្ញុំយល់ដឹងអំពីសុវត្ថិភាពប្រព័ន្ធអ៊ីនធឺណេត។	5	4	3	2	1
28.	ខ្ញុំបានពន្យល់សិស្សអំពីហានិភ័យនៃសុវត្ថិភាព ប្រព័ន្ធអ៊ីនធឺណេត។	5	4	3	2	1
29.	ខ្ញុំបានស្គាល់ច្បាស់ពីអត្តសញ្ញាណនិងសមត្ថភាព វិជ្ជាជីវៈរបស់ខ្ញុំ។	5	4	3	2	1
30.	ខ្ញុំបានធ្វើការឆ្លុះបញ្ចាំងពីការបង្រៀនរបស់ខ្ញុំ (ដោយ ខ្លួនខ្ញុំផ្ទាល់ ឬជាមួយមិត្តរួមការងារ) ដើម្បីស្វែងរក វិធីកែលម្អការបង្រៀនឲ្យកាន់តែមានប្រសិទ្ធភាព។	5	4	3	2	1
31.	ខ្ញុំខិតខំបំពេញតួនាទីការងាររបស់ខ្ញុំជាប្រចាំ។	5	4	3	2	1
32.	ខ្ញុំបានកំណត់គោលដៅអភិវឌ្ឍសមត្ថភាពរបស់ខ្ញុំ បានច្បាស់លាស់	5	4	3	2	1

*សូមថ្លែងអំណរគុណយ៉ាងជ្រាលជ្រៅចំពោះការចំណាយពេលវេលា
ចូលរួមឆ្លើយសំណួររបស់លោកគ្រូ អ្នកគ្រូ។*

APPENDIX B:
RELIABILITY AND ANALYSIS OF QUESTIONNAIRE USING
CRONBACH'S ALPHA COEFFICIENT

RELIABILITY AND ANALYSIS OF QUESTIONNAIRE

Using Cronbach's Alpha Coefficient

Components	Cronbach's Alpha	Result
Principals' Instructional leadership		
1. Developing and Sustaining School Vision	.775	Acceptable
2. Managing Curriculum and Instruction	.778	Acceptable
3. Promoting School Environment	.755	Acceptable
4. Supervising Teaching and Learning Process	.790	Acceptable
5. Driving Data to Make Instructional Decision	.848	Good
6. Sharing Leadership	.724	Acceptable
Total	.934	Excellent
The 21st Century Teaching Competencies		
1. Exercising Teacher Leadership	.726	Acceptable
2. Comprehending Subject Contents	.748	Acceptable
3. Teaching Pedagogy	.705	Acceptable
4. Establishing a Positive Learning Environment	.762	Acceptable
5. Engaging with Parents and Community	.714	Acceptable
6. Inspiring Students in Learning	.735	Acceptable
7. Digital Competencies	.744	Acceptable
8. Reflecting Professional Practice	.711	Acceptable
Total	.932	Excellent
Overall	.950	Excellent

APPENDIX C:
NAME LIST OF EXPERTS

NAME LIST OF EXPERTS

Experts For Content Validity of The Research Instruments

- 1. Mr. Ul Run** National Adviser for KAPE and NGS Operations
Manager, Phnom Penh, Cambodia
- 2. Dr. Nguon Siek** Lecturer at Kampong Speu Institute of Technology,
Kampong Speu province, Cambodia
- 3. Mr. Sokhom Huot** School Principal of Samlout High school, Battambang
Province, Cambodia

APPENDIX D:
COOPERATION LETTER

Cooperation Letters for Examining Content Validity of The Research Instruments

MHESI 68202/C1641



Faculty of Education
Prince of Songkhla University
Pattani Campus, Mueang Pattani
Pattani 94000

9 December 2022

Mr. Ul Run
National Adviser for KAPE and NGS Operations Manager
Phnom Penh, Cambodia

Dear Mr. Ul Run,

Subject: Request for cooperation in evaluating the research instrument

This is to certify that Miss. Somachita Phal is a master's degree student in Educational Administration at the Faculty of Education, Prince of Songkhla University. She is conducting research entitled "The Effect of Principals' Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in The New Generation Schools in Cambodia" under the supervision of Assoc. Prof. Dr. Theera Haruthaithanasan and Dr. Warapark Maitreephun.

In this regard, the Faculty of Education admires your proficiency in this particular field. Therefore, we would like to request for your assistance in checking the quality of the research instrument regarding the accuracy of the content, appropriateness of the language, the consistency of the questionnaires with the research objectives, and providing various suggestions as a guideline for improving the instrument used to collect data in this research.

If you have any questions or need further information, please feel free to contact Ms. Somachita Phal through the e-mail somachita@gmail.com or by mobile number +66 0623493288.

Your Sincerely,

(Dr. Warapark Maitreephun)
Associate Dean of Graduate Studies, Innovation, and International Affairs,
Acting for Dean



MHESI 68202/C1641

Faculty of Education
Prince of Songkhla University
Pattani Campus, Mueang Pattani
Pattani 94000

9 December 2022

Dr. Nguon Siek
Lecturer at Kampong Speu Institute of Technology
Kampong Speu province, Cambodia

Dear Dr. Nguon Siek,

Subject: Request for cooperation in evaluating the research instrument

This is to certify that Miss Somachita Phal is a master's degree student in Educational Administration at the Faculty of Education, Prince of Songkhla University. She is conducting a research study entitled "The Effect of Principals' Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in the New Generation Schools in Cambodia" under the supervision of Assoc. Prof. Dr. Theera Haruthaithanasan and Dr. Warapark Maitreephun.

In this regard, the Faculty of Education admires your proficiency in this education field. Therefore, we would like to request your assistance in checking the quality of the research instrument regarding the accuracy of the content, appropriateness of the language, the consistency of the questionnaires with the research objectives, and providing various suggestions as a guideline for improving the instrument used to collect data in this research.

If you have any questions or need further information, please do not hesitate to contact Miss Somachita Phal through the e-mail Somachita@gmail.com or by mobile number +66 0623493288.

Your Sincerely,

(Dr. Warapark Maitreephun)
Associate Dean of Graduate Studies, Innovation, and International Affairs,
Acting for Dean

MHESI 68202/C1641



Faculty of Education
Prince of Songkhla University
Pattani Campus, Mueang Pattani
Pattani 94000

9 December 2022

Mr. Sokhom Huot
School Principal of Samlout High school
Battambang Province, Cambodia

Dear Mr. Sokhom Huot,

Subject: Request for cooperation in evaluating the research instrument

This is to certify that Miss. Somachita Phal is a master's degree student in Educational Administration at the Faculty of Education, Prince of Songkhla University. She is conducting research entitled "The Effect of Principals' Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in The New Generation Schools in Cambodia" under the supervision of Assoc. Prof. Dr. Theera Haruthaithanasan and Dr. Warapark Maitreephun.

In this regard, the Faculty of Education admires your proficiency in this particular field. Therefore, we would like to request for your assistance in checking the quality of the research instrument regarding the accuracy of the content, appropriateness of the language, the consistency of the questionnaires with the research objectives, and providing various suggestions as a guideline for improving the instrument used to collect data in this research.

If you have any questions or need further information, please feel free to contact Ms. Somachita Phal through the e-mail somachita@gmail.com or by mobile number +66 0623493288.

Your Sincerely,

(Dr. Warapark Maitreephun)
Associate Dean of Graduate Studies, Innovation, and International Affairs,
Acting for Dean

Cooperation Letter For Data Collection

MHESI 68202/072



Faculty of Education
Prince of Songkhla University
Pattani Campus, Mueang Pattani
Pattani 94000

12 January 2023

Ministry of Education, Youth and Sport,
Kingdom of Cambodia

Dear Minister of Ministry of Education, Youth and Sports, Cambodia

Subject: Request for Cooperation in Research Data Collection

As Miss. Somachita Phal, an international student of Master of Education Program in Educational Administration, Faculty of Education, Prince of Songkhla University is proceeding research project entitled "The Effect of Principals' Instructional Leadership on the 21st Century Teaching Competencies as Perceived by Teachers in the New Generation Schools in Cambodia" under the supervision of Assoc. Prof. Dr. Theera Haruthaithanasan and Dr. Warapark Maitreephun, would like to request for your cooperation in the data collection from teachers in 10 New Generation Schools in Cambodia.

If you have any questions or need further information, please feel free to contact Miss. Somachita Phal through the e-mail somachita@gmail.com or by mobile number +66 623493288.

We sincerely hope that you will provide Miss. Somachita Phal with permission to collect the data as described above. Your kind cooperation is greatly appreciated.

Your Sincerely,



(Dr. Warapark Maitreephun)
Associate Dean for Graduate Studies, Innovation, and International Affairs,
Acting for Dean



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

ក្រសួងអប់រំ យុវជន និងកីឡា
លេខ: ៤២១ អយក.ចវិវ

ថ្ងៃ រដ្ឋាភិបាល ១០ ខែ មេសា ឆ្នាំ ខាល ចត្វាស័ក ព.ស.២៥៦៦
រាជធានីភ្នំពេញ ថ្ងៃទី ៣១ ខែ មេសា ឆ្នាំ ២០២៣

ជម្រាបជូន
លោកប្រធានមន្ទីរអប់រំ យុវជននិងកីឡារាជធានីភ្នំពេញ
ខេត្តស្វាយរៀង ខេត្តកំពង់ចាម ខេត្តកណ្តាល និងខេត្តកំពង់ស្ពឺ

កម្មវត្ថុ: សំណើសុំអនុញ្ញាតឲ្យកញ្ញា ផល សុមាជីតា ចុះធ្វើការសិក្សាស្រាវជ្រាវប្រមូលទិន្នន័យ សម្រាប់សរសេរ
និក្ខេបបទបញ្ចប់ការសិក្សាពីថ្ងៃទី២៦ ខែមករា ឆ្នាំ២០២៣ ដល់ថ្ងៃទី០៩ ខែកុម្ភៈ ឆ្នាំ២០២៣។
យោង: -លិខិតលេខ MHESI 68202/072 របស់សាកលវិទ្យាល័យសុងខ្លាណាក់ខារីន (Prince of Songkla University
នៃព្រះរាជាណាចក្រថៃ ចុះថ្ងៃទី១២ ខែមករា ឆ្នាំ២០២៣។
-ពាក្យស្នើសុំរបស់សាមីជនចុះថ្ងៃទី១៦ ខែមករា ឆ្នាំ២០២៣។

តបតាមកម្មវត្ថុ និងយោងខាងលើ ខ្ញុំសូមជម្រាបជូន លោកប្រធាន ជ្រាបថា: កញ្ញា ផល សុមាជីតា ជា
និស្សិតអាហារូបករណ៍ថ្នាក់បរិញ្ញាបត្រជាន់ខ្ពស់ ផ្នែកគ្រប់គ្រងអប់រំ នៅសាកលវិទ្យាល័យសុងខ្លាណាក់ខារីន នៃ
ព្រះរាជាណាចក្រថៃ បានស្នើសុំចុះធ្វើការសិក្សាស្រាវជ្រាវ និងប្រមូលទិន្នន័យនៅតាមបឋមសិក្សា និងវិទ្យាល័យ
នានា ក្នុងរាជធានីភ្នំពេញ ខេត្តកំពង់ចាម ខេត្តកណ្តាល ខេត្តស្វាយរៀង និងខេត្តកំពង់ស្ពឺ ចាប់ពីថ្ងៃទី២៦ ខែមករា
ឆ្នាំ២០២៣ ដល់ថ្ងៃទី០៩ ខែកុម្ភៈ ឆ្នាំ២០២៣ ដើម្បីសរសេរនិក្ខេបបទបញ្ចប់ការសិក្សាលើប្រធានបទ "ឥទ្ធិពលនៃ
ភាពជាអ្នកដឹកនាំការបង្រៀន-រៀន របស់នាយកសាលាទៅលើសមត្ថភាពបង្រៀនតាមបែបសតវត្សរ៍ទី២១ របស់គ្រូ
បង្រៀននៅក្នុងសាលារៀនជំនាន់ថ្មីនៃប្រទេសកម្ពុជា"។

អាស្រ័យដូចបានជម្រាបជូនខាងលើ សូម លោកប្រធាន អនុញ្ញាតឲ្យកញ្ញា ផល សុមាជីតា បានចុះធ្វើការ
សិក្សាស្រាវជ្រាវប្រមូលទិន្នន័យនៅតាមបឋមសិក្សា និងវិទ្យាល័យនានា នៅក្រោមការគ្រប់គ្រងរបស់លោកប្រធាន
តាម កាលបរិច្ឆេទខាងលើ តាមការគួរ។

សូម លោកប្រធាន ទទួលនូវការរាប់អានដ៏ស្មោះពីខ្ញុំ។

ឧបនាយករដ្ឋមន្ត្រីក្រសួងអប់រំ យុវជន និងកីឡា
អគ្គនាយកនៃអគ្គនាយកដ្ឋានរដ្ឋបាល និងហិរញ្ញវត្ថុ

ឧបនាយករដ្ឋមន្ត្រី

- បម្រុងជូន:**
- អគ្គនាយកដ្ឋានរដ្ឋបាល និងហិរញ្ញវត្ថុ
 - ខុទ្ទកាល័យឯកឧត្តមបណ្ឌិតសភាចារ្យរដ្ឋមន្ត្រី
"ដើម្បីជ្រាបជាព័ត៌មាន"
 - កាលប្បវត្តិ-ឯកសារ នាយកដ្ឋាន.ទវអ

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List of Conference Proceeding

Phal, S., Haruthaithanasan, T., Maitreephun, W., Nitjarunkul, K. (2023). Principals' instructional leadership affecting teachers' teaching competencies among schools in Cambodia. *Proceeding of the 6th International Conference On Education 2023 "Cultivating Sustainable and Equitable Education for All"* (pp. 50-60). Pattani, Thailand.