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Developing Learning Management Skills for Science Teachers in the 21st Century

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Abstract

The aim of this study is to enhance science instructors' 21st-century learning management abilities. Among the sample group are teachers of primary science. This resulted from using a straightforward random sample selection technique (basic random sampling). The test, the learning management assessment, and the 21st Century Science Learning Management Handbook were the instruments employed in the study. ANOVA and the t-test use pre-made statistical routines. The results show that the development of learning management skills for scientific instructors in the twenty-first century includes the theories, concepts, and tenets of a model that stresses engagement in teaching and learning activities as well as actual action. There are five steps in the model: Step 1 Engagement, Step 2 Exploration, Step 3 Explain, Step 4: Elaboration, Step 5: Evaluation, Comparing, and Measuring the 21st-Century Learning Activity Skills of Science Teachers It is clear that, following the arrangement of learning activities connected to the improvement of learning management skills for scientific teachers in the twenty-first century, there is a statistically significant difference at level 0.05. In comparison to the pre-activity, the average score rose after the learning exercise.

Keywords: *Science Learning, Management in the 21st Century, Developing Learning, Management Skills in the 21st Century.*

1. Introduction

People are major factors in today's social transformation since they are the ones who make society realize the changes that have occurred, are the main engine of the country's empowerment, and are responsible for its transition to a stable, knowledge-based society encouraging the development of people who possess the capacity for reasoning, assessment, and problem-solving. Be creative, self-taught, and adaptable enough to change courses quickly as evidenced by the National Education Plan 2017–2036, which provides standards for fostering children's maximum potential development. Teachers must have the requisite skills and knowledge in order to care for children in an appropriate manner. Organize learning in accordance with age-appropriate concepts of holistic child development. The curriculum and the children's competencies in relation to the children's quality standards are taken into consideration while planning an activity at the school. In keeping with national policies, particularly the population-educational objectives of the current Economic and Social Development Plan (Office of the Education Council, 2017, p.82). To develop ideas, one must employ social and intellectual processes that are sparked by primal, unconscious, or profound desires. to develop new ideas in order to improve efficiency in a variety of areas, including knowledge, intelligence, talent, and outstanding personality. Novel theories, advances in technology, creation of novel materials, and development of novel apparatus. According to the Expert Group on Future Skills Needs (2009), page 2, creativity is defined as the ability to generate new things that have economic value through the use of imagination or

unconventional thinking (Yorke, 2001, p.7), as well as the creation of products and novel approaches to problem-solving (O'Sullivan, 2021, p.8).

Teachers in elementary schools nowadays are essential in assisting pupils in creating and putting into practice learning management methods. As a result, they are viewed as people who, in order to assist students in realizing their full potential in a basic education, must be knowledgeable about and comprehend learning management and promote the development of a wide range of abilities, different aptitudes and skill sets of teachers. Teachers must be competent in order to create new education management guidelines that work. Smith (2004), Briggs (1991), and Gagne et al. (2004) In order to create instructional content and implement a learning management system that meets the needs of 21st-century learners, curriculum development and learning management design can be viewed as additional crucial and pertinent issues. The world is changing quickly these days. The majority of educators think that students' educational needs should determine who teaches them. It can no longer just be a knowledge transmitter; instead, it must currently be able to act as a clear facilitator for learning management engagement. It is thought to be crucial and essential to plan and carry out educational activities. by emphasizing the encouragement of students to acquire critical thinking abilities. Creativity and cooperative problem-solving abilities for students (Munna & Kalam, 2021; Shaban & Bayrak, 2020) Learning management, or experiential learning, is regarded as a crucial component of teacher training or initial teacher education and plays a significant role in the education management of quality teachers, according to a survey on various approaches to teacher professional development that have a positive impact on teaching efficiency and the learning environment (Kidd & Murray, 2020).

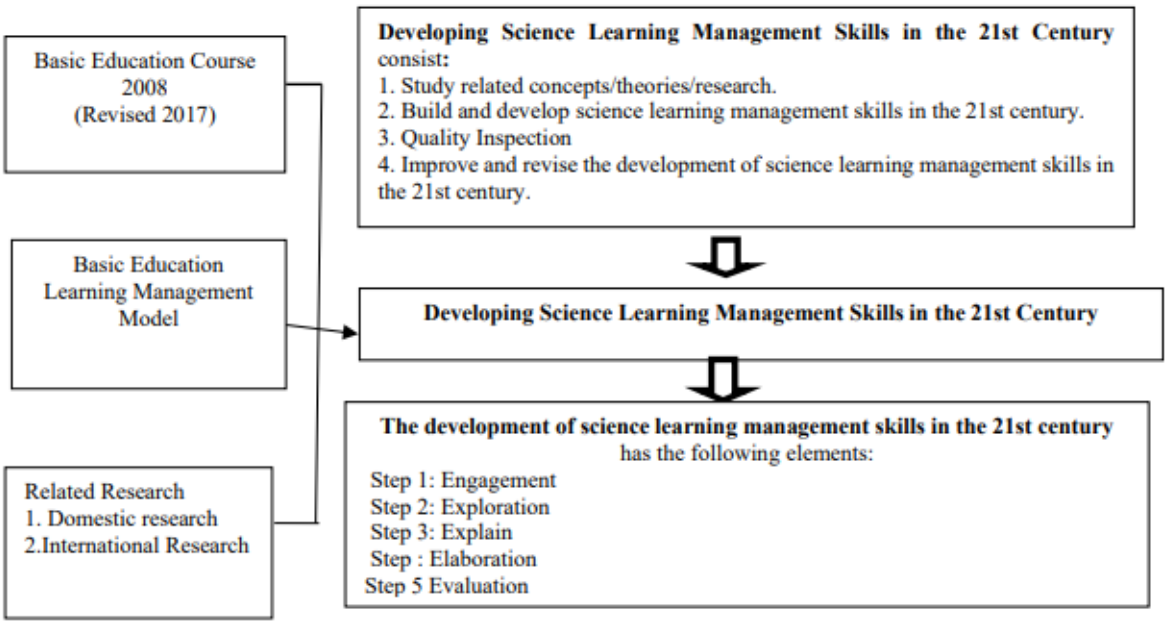
Today's scientific method is seen as important and incorporates a learning management system that students must use. Stress the importance of participation. understanding the nature of science as well as its guiding ideas and methods. Additionally, it includes 21st-century skills like problem-solving, creativity, inventiveness, and critical thinking (OECD, 2024). It is the duty of educators to carry out their responsibility (Kelchtermans et al., 2018). Additionally, it has a significant impact on instructors' professional development. In order to be able to use science in practice with students in the future, teachers should be encouraged to get direct experience as learners through practical hands-on experience (Crawford & Capps, 2018; Sjøberg, 2019). It is intriguing to investigate the most effective ways to train and grow teachers as a result. According to the study, instructors need to be professionally prepared in order to teach science (Rönnebeck et al., 2016). Studied how students look for scientific information in the classroom and found that teachers' education programs should reevaluate how they handle inquiry-based learning management. The goal is to foster the outcomes of self-discovery by being relevant to one's interests.

The modern world has become increasingly linked and complex. As a result, scientific knowledge is crucial for citizens to support their engagement in social and economic progress. It is vital to consider the influence on society in depth if a citizen possesses scientific knowledge and scientific process abilities (Bybee, 1997; Bybee, 2014; Laugksch, 2000; Roberts & Bybee, 2014). However, the notion of studying science is not What is the ultimate objective of scientific education? That much is still unknown. Naturally, Linder et al. (2011), Jimenez & Menendez Alvarez-Hevia (2021), and Howard (2003) all agree that it is still a problem that has to be discussed. The National Academy of Sciences, Engineering, and Mathematics's' most recent report (2022) emphasizes the importance of receiving a top-notch scientific education. In terms of encouraging curiosity and organically enhancing pupils' skills. The best and most influential people in scientific education are thought to be primary

school teachers. They emphasize the integrated teaching and learning management model, which considers the social, cultural, and developmental requirements of students. (Gresnigt et al., Citation, 2014) It demonstrates that teachers in elementary schools are capable of skill development. Learners' scientific qualities and knowledge. Additionally, it may take longer to oversee science instruction in the classroom. Early on, it is thought that involvement in science learning management is crucial to fostering a positive approach to science education. This is due to the numerous records that show students are not actively learning that science. After primary school, learning tends to regress, and solving problems of this nature becomes more challenging (Ali et al., 2013; Denessen et al., 2015; DeWitt & Archer, 2015; DeWitt et al., 2014; Lindahl, 2007; Said et al., 2016). Teaching positions require individuals to have the skills of the twenty-first century upon appointment. 21 into the instructional activities that are carried out in the classroom. Therefore, it is appropriate for teacher training programs to oversee the development of technology-based learning and evaluation activities. 21 These programs should shift the perception of teacher exam candidates in an academic setting, assisting science teachers in developing 21st-century learning management skills. In addition, they ought to provide them with technology knowledge and access to resources such as software and digital devices (Lawrance, Saran, Johnson & Lafontant, 2020). In order to promote and develop learning management skills for science teachers in the twenty-first century, which in turn influence the learning management behavior of primary science teachers, the research team is interested in studying and developing these skills. The research findings will be compiled into a set of guidelines for Roi Et Province that will help primary science instructors enhance their learning management abilities and become more productive.

Objectives of the Research

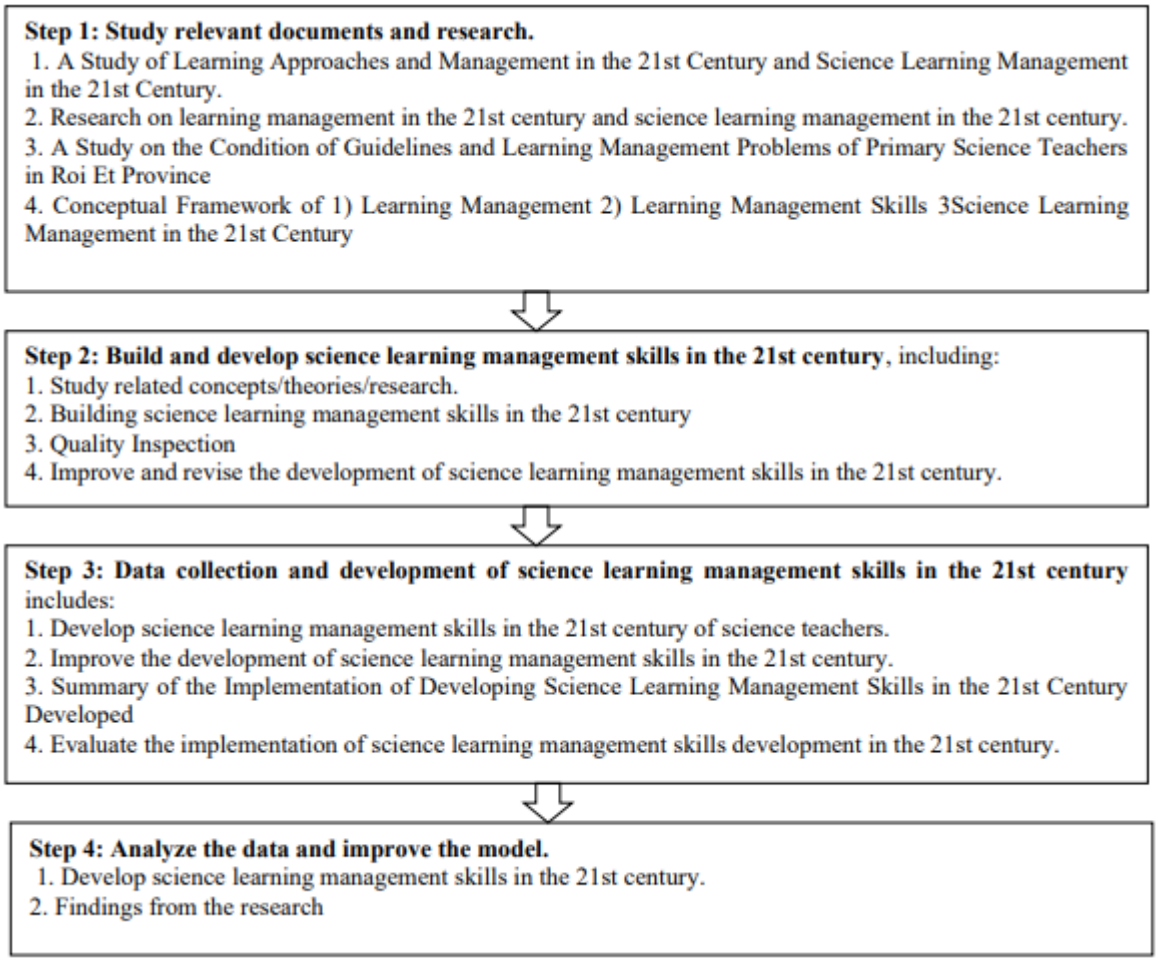
To develop learning management skills for science teachers in the 21st century in Roi Et Province.



2. Methodology

A sample group of primary science teachers participated in this research and development project. The sample group was chosen using a straightforward random sample selection technique (basic random sampling).In this experiment, three different kinds of tools are used: quizzes, assessments, and the 21st century science learning management manual. conducted

during the 25th academic year's first semester.67, with the exception of the test periods immediately before and after using the Learning Management Guide, from June 6, 2024, to July 22, 2024. Standard deviation (S.D.) T-test and ANOVA with a significance level of 0.05 for statistical significance as follows:



3. Results

The development of science learning management abilities in the twenty-first century is a process that comprises theories, concepts, and principles of a model that stresses practical action and participation in teaching and learning activities. This was found out in a study conducted by the Roi Et province. There are five steps in the model: Step 1 Engagement, Step 2 Exploration, Step 3 Explain, Step 4: Elaboration, Step 5: Evaluation.

Figure 1. Developing Science Learning Management Skills in the 21st Century

Results of Science Learning Management Skills Development in the 21st Century for Science Teachers in Roi Et Province

Overall management is the component of science education that has been eliminated the most in the twenty-first century. Its average is 4.54, and its standard deviation is 0.57. In terms of learning management behavior, it was found that teachers' spirits and the motivation to be public figures came second (see Table 1).

Table 1. Comments on the Development of Science Learning Management Skills in the 21st Century Overall

Science Learning Management	Capability		
	$\bar{X}$	S.D.	Meaning
1. Teachers' professional competence	4.48	0.61	very
2. Spiritual aspect of being a teacher	4.54	0.57	most
3. Inspiration for public spirit	4.55	0.56	most
4. Learning Management Behavior	4.58	0.56	most
Average Total	4.54	0.57	most

Table 2. Comments on the Development of Science Learning Management Skills in the 21st Century Overall

Developing Science Learning Management Skills in the 21st Century	Comment Level		Meaning
	$\bar{X}$	S.D.	
1. Engagement	4.56	0.62	most
2. Exploration	4.51	0.64	most
3. Explain	4.51	0.50	most

4. Elaboration	4.60	0.49	most
5. Evaluation	4.54	0.58	most
Average Total	4.54	0.57	most

In Table 2, skill development indicates that the management of science learning in the 21st century is the most extinguished overall, with an average of 4.54 and a standard deviation of 0.57. It was found that the creation of interests, measurement, and assessment come after knowledge expansion.

Table 3. Comparison of the development of science learning management skills in the 21st century

Events	N	$\bar{X}$	S.D	t	Sig.
Before the event	100	8.89	0.85	108.491*	0.00*
After the event	100	18.18	0.61		

In Table 3, the results of comparison the development of science learning management skills in the 21st century, after organizing learning activities related to the development of science learning skills, demonstrate that the learning of science in the 21st century differs statistically significantly at the level of 0.05. In comparison to the pre-activity, the average score rose after the learning exercise. improving scientific instructors' proficiency in teaching and learning management in all three categories, as well as their 21st-century learning management skills. involvement in the process of organizing science learning activities in the twenty-first century utilizing one-way covariance analysis (one-way ANOVA), as indicated in Table 4.

Table 4. Evaluation Results of Science Learning Activities in the 21st Century

Source of variance	SS	df	MS	F	p
Between groups	825	3	0.275	2.514	0.058
Within the group	43.338	396	0.109		
Overall	44.164	399			

* Significant at .05

Table 4 demonstrates that there was no statistically significant difference at the 0.021 5 level between the three groups' participation in the process of organizing science learning activities in the 21st century and the assessment of the development of science learning management skills in the 21st century. It is the same in the province of Roi Et. The discovery of the mean score of primary science teachers' assessments of scientific learning activities in the twenty-first century. All three groups' average scores in Roi Et Province are identical in all three categories. The three groups in Roi Et Province are involved in the process of planning science learning activities for the twenty-first century, and they are similar in terms of learning management.

4. Discussion and Conclusion

The development of science learning management abilities in the twenty-first century is a process that comprises theories, concepts, and principles of a model that stresses practical

action and participation in teaching and learning activities. This was found out in a study conducted by the Roi Et province. There are five steps in the model: Step 1 Engagement, Step 2 Exploration, Step 3 Explain, Step 4: Elaboration, Step 5: Evaluation. The Results of Twenty-First-Century Primary Science Teachers' Development of Science Learning Activities Organizing science learning activities in the 21st century was found to be the most common competence among elementary science instructors in Roi Et Province. It is clear in Roi Et Province that, after learning activities were organized on the development of science learning management skills in the twenty-first century, there was a statistically significant difference at the level of 0.05. After completing the learning exercise, the average score was greater than it was initially. As can be observed, modeling instructional goals with particular skills is thought to be a highly useful method for teaching and learning management. Teaching in this setting works so well that people embrace it (Anchunda, 2021; Chimplee, Jiraro, & Lila, 2017).

Another avenue for cultivating visual imagination in the twenty-first century is thought to be the growth of creative writing. The large number of real and authentic photographs that are available online may lend credence to such claims. (Hashmi, 2021) Further research indicates that pupils must possess 12 competencies under the 21st century skills category in order to excel in the information era. The Internet age has promoted the development of social skills, resilience, leadership, initiative, media literacy, technology literacy, communication, and social skills (Stauffer, 2020).

Because having 21st-century abilities is necessary for people to live more appropriately easier to locate answers Gain more success in their line of work by critically analyzing occurrences in their surroundings or society. People can acquire 21st-century skills at all educational levels, from primary to tertiary, including learning and rehabilitation, vocational skills, information, media, and technology (Binkley et al., 2010). The model has produced a thorough analysis of the needs for modeling, with the goal of putting comprehensive actions into practice in the context of addressing challenges (Erfani, 2019; it has also been used in small schools). Furthermore, a number of academics have endorsed the idea that a model for teacher professional development should be created in order to provide a potential route towards empowering teacher professional development (Achunda, 2021; cetin Bayrakc, 2017; Chimplee, Jiraro, & Lila, 2017; García-Rico, Martínez-Muñoz, Santos-Pastor, & Chiva-Bartoll, 2021; Ravhuhali, Mashau, Kutame, & Mutshaeni, 2015). particularly with regard to design and services for teacher education. The experiment's findings demonstrate that cooperation is required to guarantee improved integrated research study implementation.

The results show that the development of learning management skills for scientific instructors in the twenty-first century includes the theories, concepts, and tenets of a model that stresses engagement in teaching and learning activities as well as actual action. There are five steps in the model: Step 1 Engagement, Step 2 Exploration, Step 3 Explain, Step 4: Elaboration, Step 5: Evaluation, Comparing, and Measuring the 21st-Century Learning Activity Skills of Science Teachers It is clear that, following the arrangement of learning activities connected to the improvement of learning management skills for scientific teachers in the twenty-first century, there is a statistically significant difference at level 0.05. In comparison to the pre-activity, the average score rose after the learning exercise.

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