Innovative Training and Learning Program for Future Teachers in Implementing Digital-Based School Administration in MAN Cirebon, Indonesia

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A R T I C L E I N F O	A B S T R A C T
	Purpose This study examines the education and training approach used by the Cirebon City Education Office to increase teacher innovation in learning and digitally-based school administration. This study also evaluates how innovative and creative teachers manage the educational process and technology-based school administration. **Design/methodology/approach** To support the empirical conclusions of this study, primary data is gathered. Data analysis employs the partial least squares-structural equation modeling technique.

Findings According to the research, a teacher's creativity can be valuable for managing a digital school, given new training and education opportunities. **Research limitations/implications** The study has provided MAN Cirebon, Indonesia, with a path ahead for implementing digital school administration. As a result, this study is crucial for practitioners when developing solutions. **Originality/value** The uniqueness of this study appears to be quite powerful because, up until now, the school administration has only been carried out manually or with limited computer aid. However, thanks to this study, school administration is now done digitally and is linked to the national database center.

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1. Introduction

Many schools continue to struggle to provide a variety of tedious administrations made during monitoring by the education office. When outside organizations like accreditation agencies do, monitoring shows that most educational administration programs are still weak (Baptiste, 2019). Schools are more concerned with learning procedures, but not all learning-related files are adequately managed (Viner et al., 2020). Without any tangible proof in the form of properly archived hard drives, many schools rely on the memory of principals and teachers. There was, therefore, a lot of activity but no activity file data (Zhang et al., 2020). This occurs because most educational institutions disregard the significance of proper file (hard file) administration. Hard files that ought to be preserved properly end up dispersed across the classroom (Nnaji & Uzoigwe, 2021), which causes all documentation of the learning process to be lost, including timetables, attendance records, learning program plans, syllabi, study contracts, questions, and exam results. Students and other important archives are not adequately documented. Due to the teacher's constant involvement in the instructional process (Basilaia & Kvavadze, 2020), the many separate learning administration archives are not compiled into a single repository (Changwong, Sukkamart, & Sisan, 2018). Implementing all activities that have been correctly planned cannot be effectively documented because the school administrator is also swamped with administrative duties (Iivari, Sharma, & Ventä-Olkkonen, 2020).

Data reveals that just 10.2% of madrasah school administration data has been converted to digital format, 23.8% is in the process of doing so, and 66% is still in the manual data format. Data still in hardcopy form must be converted to digital as soon as possible. This is necessary because hardcopy data has several drawbacks, including a lot of storage space, high maintenance costs, easy damage and loss, and a high risk of fire, flood, natural disasters, and other risks. Handling hardcopy data into digital-based soft copies is an issue for all three Madrasah Aliyah Negeri in Cirebon City. The majority of them struggle with carrying out the process of converting data to digital format (22.4%), having insufficient storage space (24.2%), having a lack of human resources in the information and technology (IT) sector (21.4%), and the threat of hacker assaults (12%). Overall, compared to the lack of a madrasah data digitization effort, each school (OECD, 2018) or district/city-level Ministry of Religion offices should invest 35% more in technology. Students' data will always be at risk if madrasas do not spend money purchasing and maintaining servers, increasing high-capacity servers, educating human resources in IT, and implementing other data security measures (Iivari et al., 2020).

In Cirebon City, it has been found that only 4.3% of teachers are very innovative and creative, 6.2% are already innovative and creative, 12.4% are quite innovative and creative, 20.5% are not innovative and creative, and the remaining 56.6% are very un-innovative and very uncreative (Abdullah, 2019). Students can be involved in increasing teacher innovation and creativity in terms of developing active learning models (Kusumaningrum, Sumarsono, & Gunawan, 2018). It will need a huge amount of room. However, when teacher creativity has increased (Iivari et al., 2020), a larger area is required. However, when teacher innovation is still low (Chen et al., 2020), any capacity will be sufficient. The lack of education and training teachers in the city of Cirebon received is directly related to their poor degree of learning innovation. According to data for 2022, gugu who participated in training between seven and ten times as often as 4.8%, six to four times annually as many

as 6.4%, three to four times as many as 10.3%, and those who never took part in education and exercised as much as 87.5%. This is very concerning because there are many education and training opportunities, but most of them are paid (Baptiste, 2019). As a result, teachers elect not to participate in the training because they lack the funds to cover the costs of registration, lodging, and transportation.

This study's goal is broken down into three sections. To increase teacher learning innovation and digitally based school administration, the study will first look into the education and training model used by the Cirebon City education office. The second goal of this study is to evaluate how innovative and creative teachers are in managing the educational process and using technology to run their schools. Finally, this study aims to determine how teacher education and training affect student learning innovation and how that affects how well digitally based school administration is done. The originality of this study resides in how education and training foster greater creativity and innovation in educational materials, which has implications for raising the standard of digital school administration. The uniqueness of this study appears to be quite powerful because, up until now, the school administration has only been carried out manually or with limited computer aid. However, thanks to this study, school administration is now done digitally and is linked to the national database center. As a result, the data in the data center and the education reporting at the national level are real-time and not static data that is only updated once a year, but rather dynamic data based on digital school administration. Both theoretically and practically speaking, the research is substantial, and its future directions are also noteworthy.

2. Review of Literature

Digitizing school administration is employing a data reporting application centred on a national education database that can supply data in real time to record all school operations carried out in an integrated manner at the national level (Viner et al., 2020). At any time, this database is capable of providing correct data. Since this data is constantly changing and dynamic, it can deliver information rapidly and precisely (Zhang et al., 2020). Information is said to be valuable when provided clearly and promptly. When data is quickly delivered but is erroneous, it cannot be used to make decisions (Nnaji & Uzoigwe, 2021).

On the other hand, correct data that is supplied slowly will not be able to make a substantial difference in the caliber of policies. As a result, data presentation must be quick and accurate to serve as the foundation for strategic decision-making (Basilaia & Kvavadze, 2020). Data on education is crucial for initiatives to raise educational standards.

For leaders at the school level, district/city education offices, provincial education offices, and the Ministry of Education and Culture to be able to become a fulcrum for improving the quality of education nationally, they will greatly benefit from having complete, valid, and accountable data (Changwong et al., 2018; Iivari et al., 2020). When education policies are based on robust digital data rather than manual data with a very low degree of accuracy, they will be of high quality and able to positively affect the advancement of education in a country (Chen et al., 2020). Since all instructors and employees in each school's education data and reporting department can make updates anytime, digitally based school administration data offers very good accuracy. High-quality education's "heart" and lifeblood is constantly updated digital data (Abdullah, 2019). Teachers who have received training in and

socialization with digital-based school data management methods can offer educational data relevant to an accurate learning process.

It can be claimed that teachers who lack knowledge and training cannot effectively manage digitally based-school administrative data (Kusumaningrum et al., 2018). Every educational innovation implemented by teachers can be documented and uploaded to the national education database, inspiring other instructors to implement more educational innovations (Maryanti et al., 2021). It will be easier for other teachers in the area to be inspired to implement learning innovations following the capabilities and local wisdom of each region where the teacher devotes himself to the educational environment the more learning innovation data that is recorded in the education database (Agustina, Kristiawan, & Tobari, 2021). For teachers, education and training are crucial because they favour boosting learning innovation and school management (Bandur, Hamsal, & Furinto, 2022). Through education and training, teachers receive training in practical, active, inventive, creative, efficient, and enjoyable learning processes (Sumarsono et al., 2019).

Learning that is innovative and collaborative will significantly impact how well students understand the topic, how well teachers succeed, how well schools perform, and how well teacher achievement records are maintained in school databases (Kusumaningrum et al., 2018). Teachers are also taught how to prepare for the learning process through education and training. This includes creating tedious syllabuses, learning process plans, study contracts, daily test questions, and sub-summative, summative, and final school tests. The quality of schooling across the country will improve once this data is posted to the school database (Abdullah, 2019). According to earlier research by Chen et al. (2020), teacher learning innovation will rise due to education and training. Teachers' capacity to create tools for school management is improving thanks to education and training. Because all of the learning innovations that teachers carry out are properly recorded in the national education database, having highly innovative instructors will impact the quality of school management.

Those who use contemporary knowledge will experience a significant level of welfare. Innovation is the secret to success in education. Education is like a permanent inscription without innovation. The instructor should always be eager to learn new things to motivate students and act as a source of knowledge. This will help students become more creative. Innovation will add a new perspective for the teacher and its importance for the students. Teachers that are constantly inventive will be respected by their students. Non-innovative teachers will become static educators who find it hardest to take criticism, feel the most righteous, and are less open to other people changing. They struggle to accept change. Imaginative, well-read teachers can only implement novel learning tactics.

Through their education and training, teachers learn literacy. If a teacher has never participated in education or training, they are far from being a reliable source of knowledge. Like a machete, you must sharpen it before using it each time. Similarly to this, knowledge must be updated before application. Education and training are essential for enhancing the learning experience, originality and creativity, teacher quality, and school quality.

Additionally, teachers are educated and trained in educational issues, classroom learning, educational assessment, the development of teaching materials, the development of instruments for school management, and the acquisition of knowledge media. The best

learning material to use as the basis for teacher development is material on hard skills, such as technical abilities in producing learning tools, textbooks, modules, questions and evaluation tools, and follow-up learning outcomes. Soft skills, such as management, communication, digital management literacy, and others, are also necessary. Figure 1 reports the research's organizational structure.

H1: *Innovative training has an impact on teacher creativity.*
H2: *Innovative learning has an impact on teacher creativity.*
H3: *Teacher creativity has an impact on digital school administration.*
H4: *Teacher creativity mediates between innovative training and digital school administration.*
H5: *Teacher creativity mediates between innovative learning and digital school administration.*
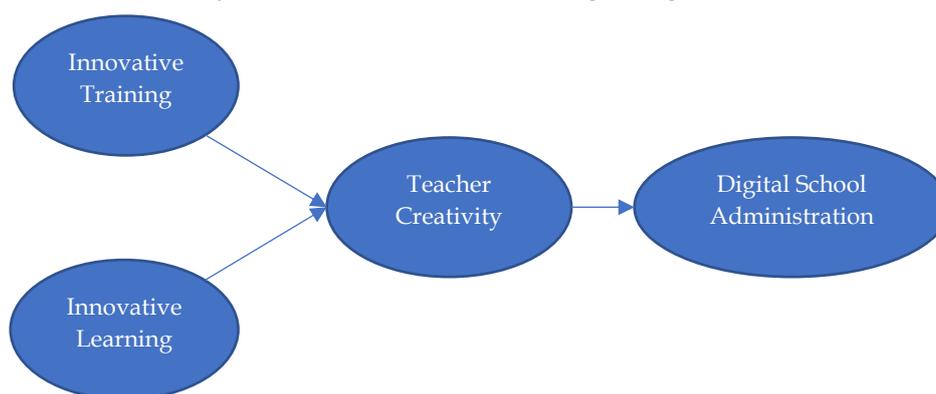

Figure 1. *Research Model*

3. Methodology

To gather data, the study has created a "scale-based" questionnaire. The preceding studies have updated the "measurement" used to gather data for every research variable. To examine the relationship between innovative training, teacher creativity, and digital school administration, the research used the scale items from the study Tenaw (2013). The researchers modified scale items from Spooren, Mortelmans, and Denekens (2007) to assess the relationship between creative learning, teacher creativity, and digital school administration. Additionally, the items used to measure the direct relationship between teacher creativity and digital school administration were modified by the researchers from a study by Bhagat, Vyas, and Singh (2015). These items were also used to assess the teacher creativity's mediating function between innovative training, innovative learning, and digital school administration. To further evaluate the direct effects of innovative teaching, innovative education, and digital school administration, the research has modified a scale from Stockard and Lehman (2004) for changeable digital school administration. This allowed for a test of the "face validity" of these items, which were then taken into account for the final questionnaire. Data for this study was gathered from various instructors at MAN Cirebon in Indonesia. The "cross-sectional" method of data gathering was used to verify the research's conclusions. Additionally, 392 participants were gathered as a "sample size" by the researchers for data analysis. Data analysis employs the partial least squares-structural equation modeling technique.

4. Findings

The "normality test" was the first step in the study of the research data, and "skewness and kurtosis" values were calculated for it. According to the research Royston, "kurtosis is a measure of whether the data are heavy-tailed or light-tailed relative to a normal distribution, and skewness is a measure of symmetry, or more specifically, the lack of symmetry" (1992). According to the research by Babbie, Wagner III, and Zaino, "a general guideline for skewness is that if the number is greater than +1 or lower than -1, this is an indication of a substantially skewed distribution, and for kurtosis, the general guideline is that if the number is greater than +1, the distribution is too peaked" (2022). As a result, Table 1's data show that the research exhibits considerable "kurtosis and skewness."

Table 1

Skewness and Kurtosis

	Mean	Standard Deviation	Excess Kurtosis	Skewness
IT1	3.244	1.523	-0.491	0.099
IT2	3.262	1.813	-0.584	0.438
IT3	3.529	1.882	-0.811	0.298
IT4	3.493	1.923	-0.827	0.37
IT5	3.543	1.747	-0.512	0.302
IL1	3.502	1.836	-0.742	0.237
IL2	3.502	1.839	-0.869	0.159
IL3	3.679	1.864	-0.776	0.189
IL4	3.692	1.88	-0.773	0.316
IL5	3.683	1.952	-0.819	0.341
TC1	3.575	1.905	-0.745	0.379
TC2	3.575	1.859	-0.642	0.36
TC3	3.602	1.913	-0.799	0.335
TC4	3.475	1.784	-0.459	0.45
TC5	3.511	1.928	-0.928	0.221
DSA1	3.471	1.819	-0.627	0.311
DSA2	3.643	1.77	-0.581	0.287
DSA3	3.077	1.486	-0.128	0.593
DSA4	3.186	1.506	0.429	0.889
DSA5	3.226	1.453	0.753	0.91
DSA6	3.167	1.456	0.439	0.768

The "convergent validity" of this research has also been put to the test by the current study. The PLS Algorithm calculates the results for "Cronbach's alpha ()", "composite reliability (CR)", and "average variance extracted (AVE)". According to Babbie et al. study. 's "Factor, loading shows how well an item represents the underlying construct, and it must be over 0.70." (2022). A measure of internal consistency, or how closely connected a group of items are to one another, is called Cronbach's alpha ($\alpha > 0.70$). According to the research by Tavakol and Dennick, it is regarded as a gauge of scale dependability (2011). According to the study by Raykov, "Composite reliability (CR > 0.70) is a measure of internal consistency in scale items, much like Cronbach's alpha" (1997). According to Alarcón, Sánchez, and De Olavide's study, "Average variance extracted (AVE > 0.50) is a measure of the amount of variance that is captured by a construct with the amount of variance due to measurement error" (2015). As a result, Table 2's data demonstrate the "convergent validity" of this study. Figure 2 also emphasizes the outcomes.
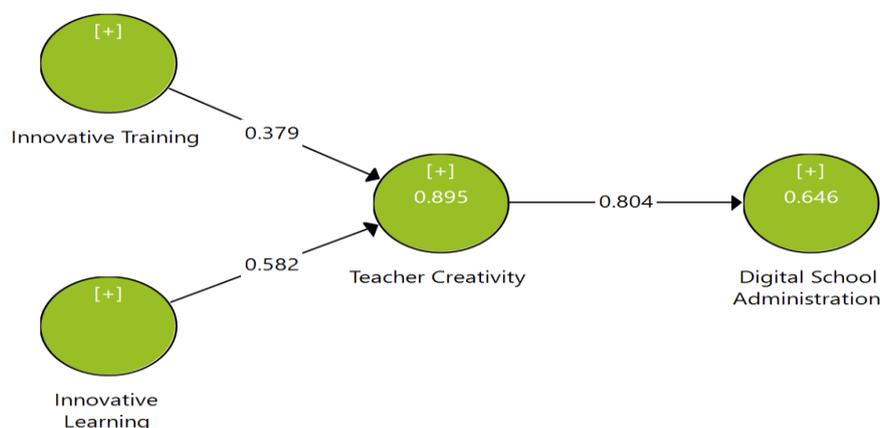
Figure 2. *Measurement Model*
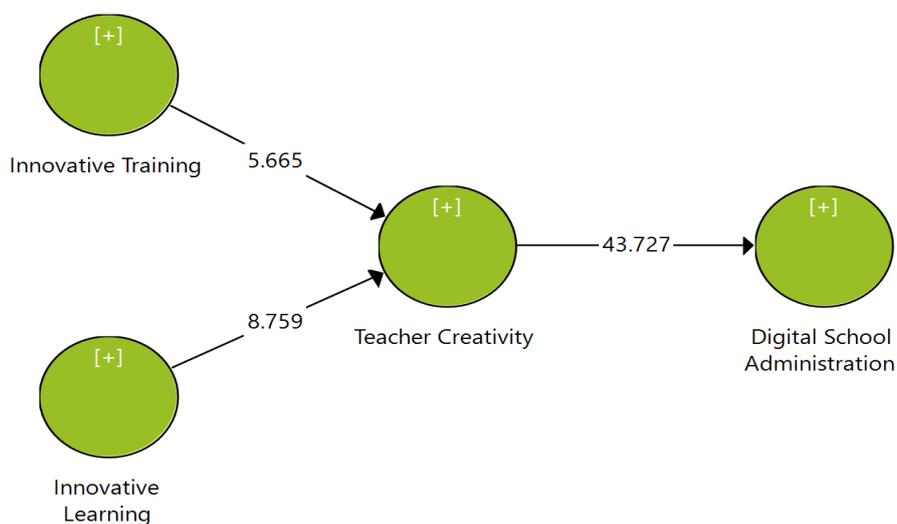
Table 2

Factor Loadings, CR, AVE, Cronbach Alpha

Construct	Indicators	Factor Loadings	α	CR	AVE
Digital School Administration	DSA1	0.828	0.918	0.935	0.705
	DSA2	0.821			
	DSA3	0.830			
	DSA4	0.867			
	DSA5	0.840			
	DSA6	0.851			
Innovative Learning	IL1	0.922	0.948	0.960	0.828
	IL2	0.907			
	IL3	0.897			
	IL4	0.905			
	IL5	0.918			
Innovative Training	IT1	0.897	0.941	0.955	0.808
	IT2	0.906			
	IT3	0.917			
	IT4	0.898			
	IT5	0.878			
Teacher Creativity	TC1	0.911	0.945	0.958	0.820
	TC2	0.889			
	TC3	0.926			
	TC4	0.902			
	TC5	0.899			

Thirdly, the conclusions of "discriminant validity" have been put to the test in this study. According to the research by Ab Hamid, Sami, and Sidek, "Discriminant validity tests whether concepts or measurements that are not supposed to be related are unrelated" (2017). According to the study of Alarcón et al., "Heteritrait-Monotrait (HTMT) is a measure of similarity between latent variables" (2015). According to the study by Gold, Malhotra, and Segars, "The threshold of HTMT is debatable; most publications recommend value should be below 0.90." (2001). As a result, Table 3's findings demonstrate that the study has "discriminant validity."

Table 3

Discriminant Validity

	Digital School Administration	Innovative Learning	Innovative Training	Teacher Creativity
Digital School Administration				
Innovative Learning	0.751			
Innovative Training	0.714	0.685		
Teacher Creativity	0.667	0.638	0.648	

The results of the "structural model" are decided later. Findings from H1 indicate that innovative training directly and favorably affects teachers' creativity. Innovative learning has a direct and advantageous effect on teachers' creativity, according to the H2 findings. According to H3 results, teacher innovation positively affects digital school administration. The H4 results also show that teachers' creativity positively mediates the relationship between innovative training and digital school administration. Finally, H5 findings show that teachers' creativity positively moderates the relationship between innovative learning and digital school administration. Table 4 and Figure 3 present the findings of the direct hypothesis. Table 5 shows the results of the mediating connection.

Figure 3. *Structural Model*

Table 4

Direct Hypotheses Results

Direct	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
Innovative training -> Teacher Creativity	0.379	0.377	0.067	5.665	0
Innovative learning -> Teacher Creativity	0.582	0.584	0.066	8.759	0
Teacher Creativity -> Digital School Administration	0.804	0.805	0.018	43.727	0

Table 5

Mediating Hypotheses Results

Mediation	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
Innovative Training -> Teacher Creativity -> Digital School Administration	0.304	0.303	0.054	5.630	0
Innovative Learning -> Teacher Creativity -> Digital School Administration	0.468	0.470	0.055	8.512	0

5. Discussion

First off, it is known from the data analysis results that instructors prefer to attend education and training at the state's expense or through school fees to avoid incurring additional costs. Education and training are crucial for improving the learning experience, originality and creativity, teacher quality, and school quality. Furthermore, instructors receive education and training related to educational concerns, classroom learning, educational assessment, the creation of teaching materials, the creation of school administration tools, and learning media. The findings of earlier research by Zhang et al. (2020) are referenced in this finding and demonstrate that, in general, every teacher is quite happy when assigned the task of taking part in further education and training since, in addition to being refreshing, they also gain knowledge and abilities. Only education and training, including instruction in performing digital-based school administration, can be used to develop a teacher's skills.

Similarly, instructional resources that may hone teachers' hard and soft skills are most helpful in the education and training they get. According to the research, teachers require various abilities to further their teaching careers in schools. Material on hard skills, such as technical skills in creating learning tools, textbooks, modules, questions and evaluation tools, and follow-up learning outcomes, is the most suitable learning material to be utilized as the foundation for teacher professional development. In addition, soft skills like leadership, communication, digital administration literacy, and others are required. Additionally, these results are theoretically consistent with those of earlier research by Nnaji and Uzoigwe (2021), who found that soft skills are far more crucial for teachers than hard skills because hard skills can be quickly learned while soft skills are embodied in personalities that include affection, adversity, and other soft skills.

Additionally, it is crucial to give teachers who have not yet received formal education at the second or third levels the education and training they need. The result demonstrates that non-degree education and training are hoped to help ensure that teacher competency is kept up with the rapidly evolving fields of science and technology. Education and training can deliver fresh knowledge that is in step with technological advancements and the most recent facts. Suppose a person's knowledge has not advanced in the ten years since receiving their bachelor's degree. In that case, it is safe to assume that they are significantly behind in their understanding of science. As a result, education and training are required to update their knowledge and adapt science to the most recent technological advances. These results are generally consistent with a prior study (Changwong et al., 2018), which found that teachers' levels of competence will significantly decline if they do not participate in various forms of education and training. Learning outcomes stop being relevant to the workplace. Teachers are unaware of advances in science and technology

that occur outside the classroom since there is no connection between educational outcomes and employment. Students will gain more when teachers keep up with advances in science and technology.

The discovery also shows how crucial it is for educators to keep up with scientific and technological advancements to use them in the teaching-learning process. Students will feel benefited since the knowledge they acquire is still relevant. When students finish their secondary education and do not pursue further education, they will still benefit from having access to the most current knowledge, which will help them keep up with the times and quickly transition into the working world. It is appropriate since teachers constantly update their knowledge to enhance student learning and educational outcomes.

Additionally, most teachers using them have employed creative and collaborative learning techniques, according to observers' findings. Students are at the heart of most of the learning process. When conversing, students have been engaged and adept at expressing their ideas. Observing how teachers use learning resources yields a variety of outcomes. The teacher used PowerPoint to great effect while fully using the chalkboard and in focus. Learning media in the form of a lab has proved successful. Career counseling has gone smoothly. Once a week, for one session, a guidance and counseling teacher teaches career guidance in each class in one-on-one settings. For all pupils to use them appropriately for their level, numerous teachers create and post instructional videos to the school website and the education data and reporting center.

Additionally, the results of this study are consistent with those of an earlier study (Iivari et al., 2020), which found that teachers can create freely when they have a wealth of knowledge. In performing their responsibilities and performing their roles as professional teachers, teachers can also be creative. Professional educators have produced significant work in modules, textbooks, action research journals, and other publications. The learning model used in the classroom is another indicator of innovative teaching practices. Students are more likely to embrace a subject matter when more and different learning models are used in the school since learning becomes enjoyable rather than tedious.

Furthermore, imaginative teachers with a high literacy level are the only ones who can implement novel learning models. Teachers acquire literacy through the education and training they receive. Teachers are far from being a source of knowledge if they have never taken part in education or training. Every time you want to use it, you must sharpen it first, just like a machete. Similarly to this, knowledge needs to be refreshed before usage. These results support the assertion made by Chen et al. (2020) that science is like a knife that needs to be polished constantly. It will be tough to address the problem with a dull knife. Any knowledge that has been sharpened will make it simple to solve various issues. A high level of welfare will be achieved for those who use current knowledge. The key to success in education is innovation. Without innovation, education is like a permanent inscription. The teacher should always be willing to learn new things to inspire pupils and serve as a source of knowledge, enabling them to be more creative. For the teacher, innovation will bring freshness, and innovation will have significance for the pupils. Students will respect teachers who are always innovative. Teachers who do not innovate will develop into static educators who find it difficult to accept criticism, feel the most righteous, and are less open to other people changing. They have trouble embracing change.

Finally, this study's findings show that teachers open to change and technological advancement will do so without difficulty. When there are changes, they will quickly innovate and adapt. The teacher's innovations are an example for students and other educators. These are breakthroughs in teaching strategies, educational media, tools for measuring learning outcomes, and strategies for coping with pupils who struggle to grasp concepts quickly. These results do not differ significantly from earlier research (Basilaia & Kvavadze, 2020), which found that teachers must be inspired, dedicated, and innovative and undertake various activities linked to updating subject matter, learning techniques, learning media, and learning evaluation tools. Today, it has become essential that all teachers constantly obtain fresh knowledge that might lead to human enlightenment and wealth if they want to teach optimally (powerfully). In light of the findings discussed above and the second problem formulation, the following second preposition can be created: Innovation is an important term to use when trying to improve something. The capacity to engage in many forms of creativity will reveal one's capacity for innovation. Only when a person has enough current information can creativity start to flow.

Theoretical and Practical Implications

A novel theoretical model of digital school administration has been added to the literature due to the research. However, the study also helped the literature generate some very complex links. The analysis first added that innovative training has a large and advantageous effect on teachers' creativity, and the research literature before this study did not comment on this relationship. The research also revealed that creative teaching and learning had a favorable and significant impact on teachers' creativity. The literature before this study did not elaborate on this relationship. Thirdly, the study revealed a connection between teacher creativity and digital school administration that was not previously explored in the research literature.

Additionally, the research expanded on a relationship not fully explored in the literature before this study: that between innovative training and digital school administration, teacher creativity has a large and good mediating impact. The research also showed that teacher creativity has a large and beneficial mediation impact between creative learning and digital school administration. The research literature before this study did not elaborate on this connection.

The education and training given to teachers will be able to increase their competency in keeping up with recent advancements in science and technology. This research also has important practical applications. Additionally, teacher competencies lag considerably behind students without education and training. The learning outcomes that pupils absorb cannot be applied to the actual world, including business and industry. Teachers will be encouraged to use creativity and innovation when producing subject matter, learning media, learning models, assessment tools, and follow-up tactics due to the education, training, and various information they have obtained.

Additionally, thanks to these numerous improvements, learning is enjoyable for students, who are less likely to get bored during class. When teachers can manage a digital-based school, all the learning innovations they have produced will be used more effectively. This implies that all teaching materials, including those kept in the Ministry of Education and Culture's Directory, can securely be kept on devices held by schools and the education office. Furthermore, it may be

deduced from the trio of research themes that instructors become more innovative when they obtain education and training. Additionally, the directories of the ministry of education and culture and the education office store information about teacher innovation. The ministry can use the national data on centralized school administration that has been digitalized to create bottom-up policies rather than top-down ones.

Future Directions

However, the results of this study showed that a teacher's creativity might be valuable for managing a digital school, provided they are given new training and learning opportunities. However, more investigation into this research paradigm is necessary. The researchers are tasked with figuring out how information and communication technology influences both teacher creativity and digital school management in this way. The researchers are also tasked with determining how student learning attitudes affect the relationship between instructor creativity and digital school management. The researchers are also tasked with determining how government regulations affect teacher creativity and electronic school management. The researchers are also tasked with determining the innovation adoption's moderating effect on the relationship between teacher creativity and digital school administration. The researchers are tasked with determining the precise impact that innovation adoption has on instructors' originality. The researchers are also tasked with figuring out how teachers' innovative work affects how digital school administration works and teacher creativity. The direct effect of teacher motivation on instructors' learning behavior is the last thing the researchers are asked to determine. These suggestions would undoubtedly be suitable to make a significant addition to the literature.

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