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تفعيل التحولات الأتمتة الذكية في البيئة المدرسية من قبل مديري المدارس داخل الخط الأخضر

Activating Smart Automation Transformations in the School Environment by School Principals Inside the Green Line

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الملخص:

هدفت هذه الدراسة إلى تحديد واقع تفعيل التحولات الذكية والأتمتة في البيئة المدرسية من وجهة نظر مديري المدارس داخل الخط الأخضر. ولتحقيق ذلك، اعتمدت الدراسة المنهج النوعي، حيث أجرى الباحث مقابلات مع عشرين مديراً.

كشفت نتائج المقابلات عن مقترحات المديرين لاستراتيجيات تفعيل هذه التحولات، ومن أبرزها: توفير بنية تحتية رقمية متكاملة، تعزيز ثقافة استخدام التكنولوجيا بين المديرين والمعلمين، تنظيم ورش عمل تدريبية مستمرة في التقنيات التعليمية، دمج أدوات الذكاء الاصطناعي في الإدارة والتدريس، وتطوير أنظمة تقييم رقمية تتوافق مع متطلبات التعليم الحديث.

الكلمات المفتاحية: التحولات الذكية والأتمتة، البيئة المدرسية، مديرو المدارس، الخط الأخضر.

Abstract

This study aimed to identify the reality of activating Smart Automation Transformations in the school environment from the perspective of school principals inside the Green Line. The study adopted a qualitative approach, and the researcher conducted interviews with twenty principals.

The results of these interviews revealed that participants proposed several strategies to activate these transformations in schools. These included providing an integrated digital infrastructure, promoting a culture of technology use among principals and teachers, organizing continuous training workshops in educational technologies, integrating artificial intelligence tools into administration and teaching, and developing digital assessment systems that align with the requirements of modern education.

Keywords: Smart Automation Transformations, School Environment, School Principals, Green Line.

Introduction

Schools are fundamental institutions that contribute to the personal and educational development of individuals, enabling them to perform their duties efficiently in service of themselves and their communities, which are inseparable parts of their identity. With the rapid Smart Automation Transformations in the educational environment and surrounding society, individuals must be equipped to engage with these changes using the most advanced educational strategies.

Schools include educational, administrative, teaching, and supervisory staff, led by school principals who bear the responsibility of driving Smart Automation Transformations and providing a modern educational environment. These principals possess a clear vision aimed at utilizing available technological resources to support the educational and professional process (Alghamdi, 2021).

Activating Smart Automation Transformations by school principals is one of the most prominent issues educational institutions strive to achieve due to its impact on improving education quality, streamlining administrative procedures, and enhancing communication among educational stakeholders. The use of digital tools fosters trust, strengthens professional relationships, and contributes to positive outcomes in performance and productivity (Alenezi, 2022).

School principals have contributed to advancing Smart Automation Transformations by refining administrative methods and employing modern technologies, which has led to their professional and technical growth and enabled them to keep pace with rapid developments in the school work environment. By investing in the educational setting, they create a learning

and working atmosphere aligned with the goals of an effective educational system (Kirkland & Sutch, 2020).

Observations of schools inside the Green Line indicate an urgent need to activate Smart Automation Transformations by school principals, given the challenges faced by school environments that require swift and effective decisions. This study was therefore conducted to explore the reality of activating Smart Automation Transformations in the school environment by school principals inside the Green Line.

Theoretical Framework

The importance of Smart Automation Transformations is reflected in the use of modern technological tools that align with educational standards and systems. This contributes to enhancing staff efficiency, facilitating their professional lives, and empowering them to serve both the internal and external educational environments (Selwyn, 2022).

A high-quality digital environment is considered one of the key factors in the success of the educational system, as it provides a balanced organizational climate that fosters job engagement, improves administrative and teaching strategies, and raises the overall efficiency of the school work environment (Al-Zahrani, 2021).

Digital quality aims to raise awareness of the importance of responding to technological developments and to create a flexible institutional environment that supports performance and productivity, contributing to the achievement of both current and future educational goals within a framework of responsibility and collaborative work (Al-Ansari, 2021).

Based on the researcher's study, it is concluded that essential requirements must be met to achieve a balance between the educational process and school principals' ability to engage with Smart Automation Transformations.

Leadership competencies are directed toward achieving the goals of the educational system and elevating the institution to a high level of effectiveness and development.

Previous Studies

- **Zhong (2016)** conducted a study aimed at measuring the effectiveness of digital leadership in supporting education through enhancing communication and collaboration among school staff in Mississippi. The study used a mixed-method approach and found that principals were more effective in supporting professional development and digital citizenship, but less effective in promoting visionary leadership and a digital-age learning culture.
- **Zhoo, Chen, Zhang, and Coplana (2019)** conducted a study in China to examine the impact of teaching and internet-based artificial intelligence systems. The study found that using such systems had a positive effect on students' academic achievement.
- **Hodges, Moore, Lockee, Trust & Bond (2020)** conducted a study in Palestine to identify the difference between emergency remote teaching and online education. The study concluded that online learning experiences differ significantly from emergency teaching in terms of planning quality and emphasized the need for educational continuity during the COVID-19 pandemic.
- **Mohammed and Al-Ghubairi (2020)** conducted a study to analyze the reality of **digital transformation** in the Kingdom of Saudi Arabia. The study revealed that digital transformation in the Kingdom has been progressing and that Saudi Arabia ranks among the top three countries in the region supporting technology.

Commentary on Previous Studies

The reviewed studies underscore the central role of Smart Automation Transformations in enhancing educational quality and institutional efficiency. However, most of them focus on higher education or global contexts, without directly addressing the reality of Smart Automation Transformations in public and private schools under the Ministry of Education within the Green Line. These studies were nonetheless instrumental in shaping the theoretical framework, identifying key indicators, and designing measurement tools, giving the current study a distinct relevance to its local and institutional context.

Problem Statement

Schools today face increasing challenges in keeping pace with Smart Automation Transformations, especially amid the rapid evolution of educational technologies. Based on the researcher's observation of the school environment, there appears to be a disparity in how school principals activate these transformations. Some schools still rely on traditional administrative and communication methods, limiting their ability to achieve institutional goals efficiently. Therefore, this study aims to explore the reality of Smart Automation Transformations activation in school environments by principals within the Green Line.

Research Question

The study seeks to answer the following main question:

- What is the reality of Smart Automation Transformations activation in the school environment by principals within the Green Line?

Significance of the Study

The study is expected to benefit:

- **School principals** by providing feedback on their level of Smart Automation Transformations activation, helping them improve administrative and educational planning.
- **Educational policymakers** by offering insights to develop more effective digital strategies.
- **Educational researchers** by enriching the literature on Smart Automation Transformations in schools and serving as a reference for future studies.

Objectives of the Study

This study aims to:

- Identify the current status of Smart Automation Transformations activation in school environments by principals within the Green Line.
- Highlight the main areas of digital implementation and the challenges hindering its application.
- Provide practical recommendations to enhance Smart Automation Transformations in schools.

Definitions of Terms

- **Smart Automation Transformations:** In this study, it refers to the use of modern technologies such as electronic systems, educational platforms, and administrative applications in school management and educational development.
- **School Environment:** The organizational and educational framework that includes all school components—administration, teachers, students, resources, and facilities.

- **School Principals:** Educational leaders responsible for managing public and private schools within the Green Line.

Delimitations and Limitations

- **Subject Delimitation:** The study focuses on Smart Automation Transformations activation in school environments by principals.
- **Human Delimitation:** The study is limited to a sample of 20 principals from public and private schools.
- **Geographical Delimitation:** The study was conducted in schools located within the Green Line.
- **Time Delimitation:** The study was carried out during the academic year 2024/2025.
- **Limitations:** The generalizability of the study results is determined by the psychometric properties of the tools used (validity and reliability) and the limited sample size.

Methodology and Procedures

- **Research Methodology:** A qualitative approach was adopted, as it suits the nature of the study which aims to explore the reality of Smart Automation Transformations activation through the experiences and insights of school principals.
- **Study Population:** The study population consisted of principals from public and private schools under the Ministry of Education within the Green Line during the academic year 2024/2025, totaling approximately 1,200 principals according to 2022 school statistics.
- **Study Sample:** A purposive sample of 20 principals was selected from both public and private schools to conduct individual interviews aimed at uncovering the current status of Smart Automation Transformations activation in the school environment.

- **Study Instrument:** An interview guide was developed, comprising a set of open-ended questions directed to the sample to explore the extent of Smart Automation Transformations activation, the challenges faced, and the domains in which digital tools are applied.
- **Study Variables:** The study included the following variables:
  - **Main Variable:** Activation of Smart Automation Transformations in the school environment.
  - **Sub-variables:** Domains of activation (administrative, instructional, communicative), barriers, and institutional support.
- **Qualitative Analysis Techniques:** Interview content was analyzed using thematic analysis, extracting frequencies and percentages, and categorizing responses into key themes to answer the research question and highlight common patterns and individual differences among participants.

Study Results and Discussion

To answer the research question: "What is the reality of activating Smart Automation Transformations in the school environment by principals within the Green Line?"

The content of interviews conducted with 20 school principals was analyzed. Participants were purposefully selected to ensure representation across public and private schools. Paragraphs were used as the unit of analysis, and after coding and compiling the responses, the researcher identified five key themes reflecting the reality of Smart Automation Transformations activation:

1. **Digital Infrastructure Activation** Eighteen participants (90%) emphasized that having a robust digital infrastructure—such as

internet access, tablets, and smart boards—is essential for effective Smart Automation Transformations. Weak infrastructure in some schools was cited as a major barrier.

2. **Use of Educational and Administrative Platforms** Sixteen participants (80%) reported using digital platforms for managing educational processes and communication, including learning management systems (LMS) and school communication tools. These platforms were seen as improving administrative efficiency and access to learning content.
3. **Staff Training in Digital Skills** Fifteen participants (75%) highlighted the importance of training teachers and administrators in digital tools. However, some noted the lack of structured and ongoing training programs, which limits the effectiveness of Smart Automation Transformations.
4. **Institutional and Cultural Challenges** Fourteen participants (70%) pointed to challenges such as traditional work culture, resistance to change, and insufficient institutional support, all of which hinder the sustainability of Smart Automation Transformations efforts.
5. **Impact of Smart Automation Transformations on Education Quality** Thirteen participants (65%) affirmed that Smart Automation Transformations has improved education quality by enhancing interaction, diversifying resources, and streamlining assessment and monitoring. However, the impact varies depending on the level of digital tool activation.

Researcher's Conclusion

The researcher concludes that activating Smart Automation Transformations in school environments by principals within the Green Line is a critical necessity for modern educational advancement. Success depends on infrastructure readiness, staff training, institutional support, and a culture of openness to change, all of which contribute to building an integrated and effective digital learning environment.

Study Recommendations

Based on the findings, the researcher recommends:

1. Increasing investment in **digital infrastructure** across public and private schools.
2. Implementing **continuous training programs** for educational and administrative staff in Smart Automation Transformations.
3. Developing institutional policies that support **digital innovation** and promote a culture of change.
4. Activating **digital assessment tools** to ensure performance quality and educational efficiency.

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