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# The Improvement of Teachers' Digital Competencies through Informal Learning Motivation in the Workplace

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ABSTRACT

*This study aims to evaluate the effectiveness of informal learning motivation in the workplace in enhancing teachers' digital competence in the era of the Industrial Revolution 4.0. This informal learning motivation was designed using the ADDIE model, which includes analysis, design, development, implementation, and evaluation. The research sample consisted of 30 teachers, including 5 vice principals. The analysis results show that before the implementation of informal learning motivation, around 40% of teachers lacked confidence in using digital technology, and 60% experienced difficulties in using online learning applications. Encouraging informal learning proved to significantly improve teachers' digital competence, with the average test score increasing from 50% before the intervention to 80% afterward. In addition, 90% of participants felt more confident using digital learning applications, and 85% found this approach highly relevant to their needs. Despite the positive outcomes, challenges included limited time for mastering the material and the need for continued assistance. Therefore, it is recommended to provide ongoing informal support through intensive mentoring, along with periodic evaluations of technology implementation in learning. Teachers were motivated through the use of social media platforms such as YouTube, Pilot AI, and others. This study recommends that schools formulate internal policies that comprehensively support the integration of technology through informal learning approaches to enhance teachers' professionalism in the future.*



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## INTRODUCTION

The rapid development of information and communication technology (ICT) in the era of the Industrial Revolution 4.0 requires the education sector to continuously adapt, including in terms of teachers' digital competencies( Mahendara, et.al 2023). Teachers are not only expected to operate digital devices but also to use technology creatively and pedagogically in the learning process (Bauer, 2020). However, the reality in the field shows that not all teachers are motivated to utilize digital technology adequately (Maja, 2023). Many still face difficulties in effectively using technology, whether in designing digital teaching materials, managing online classes, or utilizing internet-based learning platforms.

One strategy to address this challenge is by providing motivation to teachers to use learning media available on social media, enabling them to become more tech-savvy through on-the-job training. This informal learning approach allows teachers to learn directly in their work environment with a more contextual and relevant approach to their daily tasks (Noe et al 2013). In addition, principals and supervisors can motivate teachers to engage in informal learning at the workplace, which can enhance collaboration among teachers, strengthen a culture of shared learning (learning community), and accelerate the internalization of digital skills through immediate application in teaching activities.

Workplace-based learning is also considered more flexible and efficient as it does not require relocating or completely abandoning teaching duties. Therefore, this approach becomes a strategic alternative for the sustainable improvement of teachers' digital competencies. Hence, a comprehensive study is needed to examine the effectiveness of providing motivation through informal learning at the workplace in improving teachers' digital competence, to serve as a reference for future policies in teacher professional development.

## METHODS

The research method used by the author is the ADDIE model, which is highly relevant for developing and evaluating a program to enhance teachers' digital competence through motivation for informal learning in the workplace. Each phase of ADDIE (Analyze, Design, Develop, Implement, Evaluate) will be adapted to explore and strengthen how motivation and informal learning contribute to improving teachers' digital skills.

### Analyze

In this phase, the author analyzes the initial condition of teachers' digital competence and the extent of their motivation to engage in informal learning in the workplace. The analysis involves identifying the characteristics of teachers as participants, common forms of informal learning (such as peer discussions, self-exploration, sharing best practices), as well as factors that drive or hinder motivation in independent and collaborative digital learning. The gap between current digital capabilities and the competencies required is also identified as a basis for developing interventions based on informal learning motivation.

### Design

This phase involves designing strategies to promote informal learning based on internal and external motivation. The author designs a work environment that supports informal learning (e.g., learning communities, mentoring, small group discussions), and develops flexible but structured informal learning scenarios, including motivation measurement tools and indicators for achieving digital competence. The design emphasizes andragogical approaches and principles of contextual workplace learning.

### Development

In the development phase, the author prepares instruments, supporting materials, and facilitation guides to promote effective informal learning. Materials are open and flexible, such as digital platform usage guides, short video tutorials, case studies of best practices, and learning reflection sheets. The author also develops instruments to measure learning motivation and self-directed improvement in digital competence.

### Implementation

This phase involves applying the designed strategies to encourage teachers' motivation and engagement in informal workplace learning. Activities such as problem-based casual discussions, sharing best practices among teachers, and daily digital challenges are facilitated as

part of informal learning. The author will conduct observations, documentation, and interviews during the process to understand the dynamics of informal learning that occur.

**Evaluation**

Evaluation is conducted to assess the effectiveness of strategies to enhance digital competence through informal learning motivation. It covers two aspects: (1) increased motivation and engagement of teachers in informal learning, and (2) improved digital skills that can be applied in teaching. The author will also gather feedback from participants to refine the approach and materials in the future. Evaluations are conducted both formatively and summatively to ensure the quality of the intervention.

The research method used by the author is the ADDIE instructional development model (Analyze, Design, Develop, Implement, Evaluate), which is highly relevant for designing and evaluating a program to enhance teachers' digital competence through a motivational approach to informal learning in the workplace. In the Analyze stage, the author conducts an analysis of the initial state of teachers' digital competence and their level of motivation for engaging in informal learning, such as peer discussions, independent exploration, and sharing of best practices. This analysis also includes identifying factors that support and hinder learning motivation, as well as mapping the gap between existing and required digital competencies. In the Design stage, the author develops strategies to promote informal learning based on intrinsic and extrinsic motivation. The design includes the development of flexible and structured informal learning scenarios, learning communities, mentoring, small group discussions, as well as the creation of motivation measurement tools and indicators for digital competence achievement. The Development stage focuses on preparing supporting materials and learning instruments such as digital platform usage guides, short video tutorials, best practice case studies, and reflection sheets that support both self-directed and collaborative learning. In the Implementation stage, the designed strategies are implemented through informal learning activities in the workplace, such as problem-based discussions, sharing best practices among teachers, and daily digital challenges. The author also conducts observations, documentation, and interviews to understand the learning dynamics. Finally, in the Evaluate stage, formative and summative evaluations are conducted to assess the effectiveness of the intervention in increasing motivation for informal learning and improving teachers' digital skills. This evaluation also includes collecting feedback from participants as a basis for refining future programs.

## RESULTS AND DISCUSSION

### 1. Research Findings

**a. The level of teachers' digital competence before and after motivation through informal workplace learning**

The digital competence level of teachers before and after receiving motivation through informal learning can be measured using the evaluation instruments developed during the Development phase. Before the training, the author will conduct a baseline analysis of teachers' digital competence using interviews or questionnaires that identify their existing technological skills. After the informal learning program is implemented, the author will evaluate changes in teachers' digital abilities, such as using digital applications for teaching, utilizing YouTube as a learning source, and adopting other technologies. Improvements in digital competence can be observed through increased technology integration in daily teaching and changes in attitudes toward digital-based learning.

**b. The implementation of motivation through informal learning in the workplace to improve teachers' digital competence**

Teachers are motivated by school principals and supervisors through facilitated group discussions, sharing experiences in using technology for teaching, and demonstrations of digital tools such as YouTube and AI applications like GeoGebra. The implementation is carried out in a supportive atmosphere, with mentors or supervisors encouraging teachers to continuously learn and share knowledge, while also providing constructive and positive feedback. Teachers are expected to be inspired to engage more in digital learning beyond formal hours using web-based platforms or social media. The program will be adjusted according to the learning styles and competency levels of individual teachers.

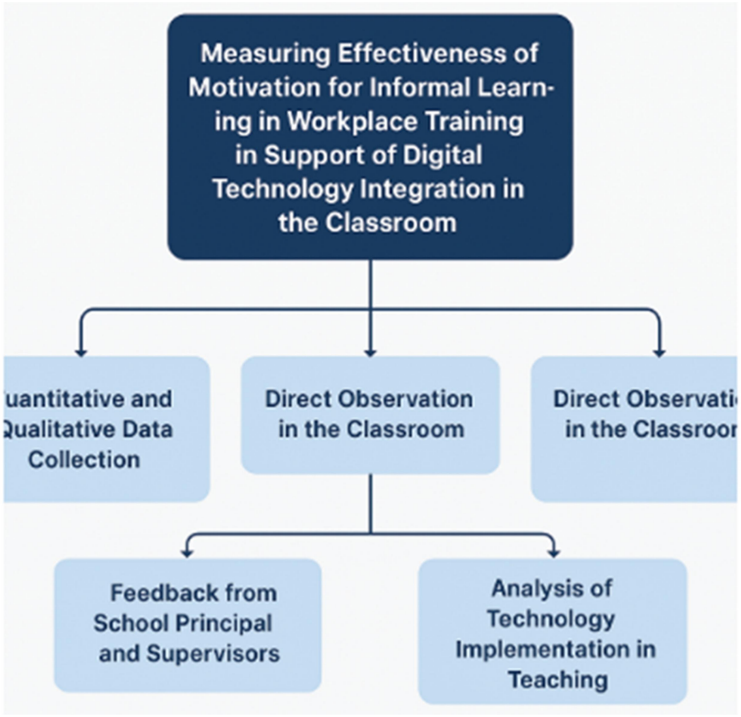


**Figure 1.1**
**Effectiveness of motivation through informal learning in the workplace**

This can be achieved by combining qualitative and quantitative data, including direct classroom observations, feedback from principals and supervisors, as well as analysis of technology use in teaching. The first step involves collecting data through pre-tests and post-tests to measure teachers' digital skills, and Likert scale surveys to assess their motivation and engagement levels. In-depth interviews or focus group discussions (FGDs) with teachers can provide insights into the impact.

Informal Motivation for Changing Mindsets and Teacher Motivation Direct classroom observations aim to assess how frequently technology is used in learning activities and to what extent it supports learning objectives. Feedback from principals and supervisors can provide perspectives on the improvement in teachers' use of technology and the challenges they face. The evaluation of technology implementation is conducted by comparing learning outcomes using technology with the pre-defined objectives. Finally,

teacher follow-up and reflection help improve and refine the motivation program to further support the development of digital competencies.

**c. Supporting and Inhibiting Factors in Motivation through Informal Learning in the Workplace to Improve Teachers' Digital Competence Role of Principals and Supervisors**

Active support from school principals and supervisors is essential in providing motivation. They can set examples in using technology and support the development of an open learning culture in the workplace.

**d. Effectiveness of Providing Motivation through Informal Learning in the Workplace in Supporting the Implementation of Digital Technology in the Learning Process**

The effectiveness of informal learning motivation can be seen from how well teachers implement digital technology in learning after participating in the program. Post-program evaluations, such as direct classroom observation and interviews with participants, will indicate whether teachers feel more confident using YouTube to teach materials or using GeoGebra to support math learning. In addition, feedback from participants will provide an overview of whether they feel more motivated to integrate technology into their daily teaching practices. Evaluation results will measure whether the informal learning motivation provided can significantly improve the actual use of technology in the classroom. Measuring the effectiveness of motivation through informal learning in the workplace can be done through a comprehensive approach, including quantitative and qualitative data collection, direct classroom observations, and feedback from principals and supervisors. Effective evaluation will show a real improvement in teachers' digital competence, as reflected in the application of technology in learning. Structured follow-up and reflection are also important to refine the program and support further professional development.


**Figure 1.2 Final Stage Diagram**

Improving teachers' digital competence through informal learning begins with an initial analysis, where interviews and questionnaires are used to identify the level of teachers' digital competence. Then, an informal learning program is planned, which includes the development of materials and strategies tailored to each teacher's learning style. In the implementation phase, informal learning is conducted at the workplace through group discussions, sharing best practices, and digital tool demonstrations such as YouTube and GeoGebra, supported by school principals and supervisors. The effectiveness is evaluated through pre-tests and post-tests to measure the development of digital competence, motivation surveys using Likert scales, classroom observations to assess the frequency and quality of technology use, interviews or FGDs with teachers, and feedback from principals and supervisors. Subsequently, supporting and inhibiting factors are identified by considering leadership support, access to technology, and a collaborative work culture. The process concludes with structured reflection and follow-up in the form of program improvement, motivation reinforcement, and support for ongoing professional development. The final outcome of this entire process is a measurable improvement in teachers' digital competence, the application of technology in learning, and a shift in teachers' mindsets and motivation in facing digitally-based educational challenges.

2. Discussion

a. The research results show that teacher motivation to engage in informal workplace learning plays a key role in improving digital competence. These findings align with the informal learning theory proposed by Marsick and Watkins (1990, 2001) and Eraut (2004), which emphasize that informal learning processes tend to occur in an unstructured manner, are experience-based, and arise from individual initiative. In this context, highly intrinsically motivated teachers tend to be more active in independently exploring technology, whether through discussions, self-training, or using digital platforms such as YouTube, Canva, or other learning apps.

b. Furthermore, teachers' digital competence, as described by UNESCO (2011) and Prasojo (2019), includes the ability to integrate ICT into learning and professional activities. This study shows that a motivation-based informal learning approach in the workplace can encourage teachers to independently develop these skills without relying on formal training. This supports findings by Astuti and Setiawan (2024), which state that digital informal learning mediates the relationship between digital competence and teachers' innovative work behavior, particularly in the context of the Merdeka Belajar policy.

c. The entire research process was designed using the ADDIE model (Branch, 2009), which is well suited for developing training based on informal motivation. In the Analyze phase, the researcher identified gaps in digital competence and teacher motivation factors. In the Design and Development stages, flexible and contextual strategies and materials were designed to encourage informal learning. The Implementation of activities such as casual discussions, sharing best practices, and daily digital challenges proved effective in increasing teacher engagement. The Evaluation phase showed a significant increase in both teacher motivation and digital competence.

## CONCLUSION

The effectiveness of providing motivation through informal learning is measured using quantitative and qualitative approaches, as well as direct observation. Proper evaluation will demonstrate whether the motivation has succeeded in improving teachers' digital skills and promoting the use of technology in learning. Structured follow-up and reflection are important to optimize teachers' professional development. Teachers' digital competence was measured through initial analysis and post-program evaluation. This evaluation involved pre- and post-tests and surveys to measure changes in the use of technology, such as YouTube and other digital applications. Improvements were evident in more frequent use of technology in teaching and changes in attitude toward digital-based learning. Motivation was provided by principals and supervisors through group discussions, sharing experiences, and demonstrating the use of technology. The program was tailored to the teachers' learning styles and competence levels, focusing on supportive encouragement and motivating teachers to continue learning and sharing knowledge. Active support from principals and supervisors is critical in encouraging. Supporting factors include the presence of an open learning culture and examples set by leaders, while inhibiting factors include limited time and access to technology. The effectiveness of informal learning motivation is measured by the frequency of technology use in learning after the program is implemented. Evaluation is conducted through classroom observations and teacher interviews to assess whether they feel more confident and motivated in using technologies such as YouTube and GeoGebra in teaching.

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