OBSTACLES IMPEDING THE SUCCESSFUL INCORPORATION OF TECHNOLOGY WITHIN EDUCATIONAL SETTINGS

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Abstract: *This paper explores the challenges and barriers that hinder the effective integration of technology in educational environments. Through a comprehensive analysis of these obstacles, the article sheds light on the complexities involved in leveraging technology to enhance teaching and learning outcomes.*

Keywords: *technology integration, educational settings, internal barriers, second-order barriers, teacher training, technical support.*

Advanced technology has greatly benefited education, yet obstacles hinder its effective integration. Ertmer identified two types of barriers: first-order or external barriers like internet access and training deficiencies, and second-order or internal barriers like attitudes and classroom practices influenced by personal beliefs and cultural contexts [1].

External barriers can be subdivided into three categories: *availability and accessibility, institutional and technical support, and stakeholder development*.

The availability and accessibility barrier category represents limited access to useful, up-to-date and necessary software and hardware. These factors are considered to be barriers to technology use. Teachers need access to high quality equipment in order to provide the effective technology integration into their classroom practice.

Next category is more about lack of technical support specialists, who support the development of technology and help educators to use it successfully in their classrooms. Institutional and technical support category of barriers encompass the problems related to those who work as technical support

personnel have the lack of appropriate experience and skills, which hinders the implementation of technology. Technical issues were identified as a significant impediment for teachers, encompassing challenges such as delays in website loading, difficulty connecting to the internet, malfunctioning printers, and the use of outdated computers.

The third external barrier, stakeholder development, affects faculty, staff, and teachers involved in technology integration. For instance, imagine a school where teachers are provided with new tablets for classroom use, but they lack training on how to incorporate them effectively into their lessons. This lack of subject-specific training hinders their ability to utilize the technology to its full potential. Additionally, stakeholders may lack expertise and awareness of how to implement technology in educational settings. Overcoming these challenges requires addressing complexities in training, such as time availability and integrating technology into teacher training programs, to enhance digital literacy, pedagogical skills, and subject-specific technology application.

Second-order barriers are complex and harder to overcome because they involve human understanding, including knowledge, skills, attitudes, and beliefs. Teachers' limited expertise can lead to low self-efficacy, causing them to avoid using technology. To address these barriers, it's essential to understand teachers' attitudes towards technology and their views on learning and classroom environments. Some teachers perceive technology as disruptive tool and are resistant to change [2]. One example of a second-order barrier hindering technology integration in classrooms is when a teacher believes that traditional teaching methods are superior to using technology. This mindset can lead to resistance towards incorporating new tools and platforms into lesson plans, even if they could enhance learning outcomes.

Time and funding constraints, which involve both internal and external factors, pose significant barriers to technology integration in education. Educators often lack time to develop new skills and materials for using

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technology effectively in the classroom. Many have the necessary skills but underutilize technology due to time limitations. In some cases, school funding might not be able to support teacher training [3]. Researchers highlight time constraints and inadequate computer access as obstacles to teachers' adoption of technology. According to Wallace, there are third-order barriers that put first-order and second-order barriers in the context of the school [4]. These barriers include school culture and institutional structure, which can either support or impede technology integration efforts. School culture encompasses shared values and practices, while institutional structure involves administrative policies and decision-making processes. Overcoming these barriers requires systemic changes to foster innovation, collaboration, and continuous improvement, empowering educators to leverage technology effectively for better teaching and learning outcomes. There are 4 sources of barriers proposed by Schulz, Isabwe, and Reichert: (1)human factors, including mindset and confidence; (2)intrinsic values, such as level of interest or satisfaction; (3)the requirements of the tool itself, adaptation or learning processes; (4)all of these factors are influenced by environmental factors [5].

The identification and understanding of barriers to technology integration in the classroom are crucial steps towards overcoming challenges and maximizing the benefits of digital tools in education. Through collaborative efforts among educators, administrators and technology providers, barriers to technology integration can be mitigated, paving the way for more inclusive, engaging, and effective teaching and learning experiences.

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