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Developing Online Professional Development Platforms for Educators

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ABSTRACT

The increasing need for adaptable teaching methods and professional growth opportunities has pressured educational institutions to transform traditional professional development for educators. This paper examines the development of effective online professional development (PD) platforms, focusing on designing engaging learning experiences, utilizing technology tools, building communities of practice, and addressing challenges such as digital inequity and assessment mechanisms. Through an extensive literature review and empirical analysis across multiple cases, the study highlights critical factors influencing the success of online PD initiatives, including instructional design choices, feedback mechanisms, and community engagement strategies. A comprehensive design framework is proposed to guide the creation of robust online PD environments that foster teacher learning, collaboration, and student achievement. The findings provide actionable insights for educational leaders, instructional designers, and policymakers aiming to enhance the effectiveness and accessibility of online professional development programs.

Keywords: Online Professional Development, Teacher Training, E-learning Design, Community of Practice, Instructional Design, Digital Tools for Educators.

INTRODUCTION

There is increasing pressure on school systems to cater to diverse learning needs and transform teaching practices. Providers of teachers' professional development face challenges in delivering education that supports working teachers while engaging large numbers of educators. Traditional methods are often seen as inadequate, prompting exploration into telecommunication-based education and e-learning systems for continuing education. Despite initial evaluations of e-learning in teacher education, a deeper understanding of its effective application is still required. E-learning offers advantages but also presents challenges due to the complexity of design processes. Government organizations and educational institutions frequently underestimate these issues. In in-service professional development, design concerns range from process constraints to the importance of aligning e-learning systems with user needs. The study aims to create a design framework for teachers' professional development that illustrates the impact of design choices on learning and performance goals. It also guides e-learning designers in making effective decisions. Initially, a literature review analyzes relevant educational and technical developments to highlight the design challenge's complexity. Empirical research across ten cases sheds light on the impact of design process choices. Ultimately, results are evaluated with experts in online education, leading to a design framework and guidelines for developing online professional development programs for teachers [1, 2].

The Importance of Professional Development for Educators

The professional development of educators is crucial for the advancement of the education system. By focusing on teachers' professional growth, several objectives can be met, including adapting to changes and sharing new knowledge effectively with students. This ongoing learning enables teachers to employ

new strategies, facilitating better transfer of knowledge to students. Furthermore, professional development plays a significant role in exchanging ideas aimed at assisting children with learning difficulties. The impact of theorizing on professional approaches enhances the ability to address these challenges. Ongoing design and diversity in professional faculties are needed to support knowledge exchange through varied experiences. Teachers are central to the cultural and transformative growth of students, emphasizing the necessity of enhancing their skills and understanding within their profession for better student outcomes. Literature supports that focused professional development can enhance both student and teacher learning capabilities. This study emphasizes the significance of teacher professional development in improving student performance. Professional development is defined as the comprehensive acquisition of knowledge and skills throughout an educator's career. The National Staff Development Council describes it as a sustained approach to boosting teacher effectiveness and student achievement. Recently, there has been a renewed emphasis on teacher development to enhance student performance, with education reformers believing that high-quality professional development leads to this improvement. Teachers engaged in effective professional development have a more substantial influence on student performance than those with limited experience. The central question remains whether Internet-based learning environments can foster a more reflexive community of practice to support necessary professional development in education [3, 4].

Current Trends in Online Learning

A year of COVID-19 significantly accelerated online learning growth, including credit courses. Educators and students, although generally assumed to be familiar with online formats, faced an unplanned transition to remote learning. The shift from in-person classes to online formats has highlighted and intensified existing inequalities in the K-12 educational system. Although the potential for online learning to create equitable opportunities was envisioned in the early 1990s, students' preparedness for online courses varies greatly, a disparity worsened by COVID-19 and hastily structured remote instruction. Young individuals from well-resourced environments with technology access and flexible learning opportunities tend to excel in online coursework compared to those from technology-poor backgrounds with rigid learning approaches. Experienced online educators must be included in discussions about online learning environments. Transitioning instructor-led K-12 experiences to video conferencing can simplify tasks but risk becoming basic replications of physical classrooms, often resulting in flat content presentations and fragmented communication. Instructional designers can assist educators in adapting instructional models to new technologies. Learning designs, rooted in existing research on active learning, should engage students in dynamic learning contexts; teaching assistants can support instructors at any skill level. Proposals for the New Learning Environment Design Challenge must also provide a comprehensive outline for an asynchronous, open course based on these designs [5, 6].

Designing Effective Online Learning Experiences

The rapid growth of online courses by universities reflects a desire to accommodate busy individuals completing their qualifications. Yet, many education professionals find limited opportunities for online professional development. Online education encompasses university courses leading to qualifications and also includes offerings from non-university organizations focusing on specific skills. This online professional development is part of a larger educational revolution driven by the Internet. Teaching providers worldwide are heavily investing in online course offerings to meet the needs of busy professionals, but many educators appear out of step with this advancement. There exists a notable gap in training for educators and trainers, leading to concerns about their readiness for online teaching. In response, the authors created initiatives to help these professionals develop skills necessary for creating and delivering online learning. Unfortunately, the anticipated results haven't materialized, particularly in how educators redesign learning for online formats. Nevertheless, it is expected that programs will expand once there's a clearer understanding of high-quality online program development. Crafting online learning differs significantly from traditional face-to-face education, requiring a unique grasp of the learning process and various skills. Experienced teachers, whether educating children or adults, find that their skills don't easily transfer online. Design and teaching competencies that might be secondary in traditional settings become critical in the online environment, highlighting the importance of developing coherent learning units over several weeks [7, 8].

Technology Tools for Online Professional Development

Various technology tools are available for educators to enhance their online professional development activities. These tools facilitate continued collaboration after in-person sessions end. This paper discusses new technologies that can serve as moderators for professional development, providing examples to

enrich facilitators' options for online events. VoiceThread, for instance, allows users to create presentations similar to PowerPoint, enriched with voice and video comments and various media. After creating a VoiceThread, users receive a unique code to share and invite contributions. Tools like VoiceThread, easy to use and produce professional results, foster community among participants. In asynchronous sessions, participants are motivated to engage with materials actively, knowing they must comment and question. Voice Threads can be shared institution-wide, serving as archived resources for future reference. Additionally, wikis and recording applications can be used for reflective questioning and capturing insights from online sessions. This content can be embedded in wikis, enabling ongoing contributions to key ideas discussed. Data and protocols from these discussions can be shared for future reflection on professional development experiences, encouraging participants to consider applying their learning in specific settings. Building this artifact collectively creates a collaborative space for exploring new approaches after professional development. Digital tools also allow for real-time connections through instant messaging to discuss fruitful topics. Utilizing these technologies can provide moderating educators with fresh insights and a broader range of software options for enriching professional development events [9, 10].

Creating Engaging Content

The vocational performance tasks are recorded and uploaded on the learning management system by the task developers or performance examiner; analysis of students' videos by the task developers or performance examiner, the judges, and their feedback is visualized. The development of an online platform, including evaluation systems that analyze students' recorded videos, is being developed. The visualized analysis results produce scores under the readability metrics as well as feedback, and those results are presented on time-series graphs. The analysis, feedback can help not only with automatic scoring but also with the additional feedback needed for 11 students. For the task development, rubric-based use of cases composing video retakers is proposed. Students' pre-self-introduction and post-self-assessment videos can be recorded on the presentation or performance task, and they can help focus on the areas to be improved. The methodology to generate rubrics from performance videos is also suggested. How operators transfer the jumping performance or style by visualizing the key points of scores and feedback is analyzed, which gives suggestions to improve their performance. For the analysis of the presentation or performance task, the models trained by students' videos in late usage must be examined externally. How the explainability of the trained feedback models from the coding perspective is presented. The explainable visualizations of feedback can help both developers and students. The feedback issues in the presentation or performance task could be improved by utilizing self-assessment or peer review. It is proposed to distribute roles among students in the peer-assessment task, and utilizing scoring matrices by roles improves the accuracy. The contents can be expanded to assist peer review or self-assessment. A novel matrix representation considering the differences in role-discussing is suggested to build rubrics [12, 13].

Assessment and Feedback Mechanisms

An online assessment and feedback mechanism will track and evaluate educators' participation in the Professional Development Modules. With institutions offering a more flexible approach to Professional Development for educators, the need to track participation and involvement is a priority for many. All modules include a Learning Record, which is a document that outlines the module content, materials used, evidence of attendance, outcomes, and a reflective review. This document is completed by the participants after the module. An online submission mechanism for the Learning Records with instantaneous email notification will assist in tracking participation within modules. For the Assessment and Feedback Mechanism, options considered centered around creating an environment where the participants could engage and reflect on their learning within the online platform. All options considered focus on creating and nurturing an ongoing dialogue between participants, module designers, and facilitators, ensuring that input can be provided openly and engagingly. This allows for appropriate feedback to be developed by the facilitators, which can act as a starting point when reworking a module for future engagement with participants. Numerous tools were considered for integration into the platform and to bolster the Assessment and Feedback Mechanism. An option was to create online forums alongside each module within the platform. Participants could use these to ask general questions, provide feedback, and ask technical queries on the online engagement approach. A central forum would be monitored by the Academic Admin, who could respond to queries, review feedback, and point out comments/ideas for module revision to the participants. Forums were considered in terms of accessibility to a wider audience beyond native English speakers, the need to monitor them, and participants needed to make a time investment to be a part of the discussion. These concerns led to the final tools. A feedback

survey was sent to each participant after all modules, containing a mix of scaled questions and open-ended responses, which allowed for input on improvement suggestions. Additionally, to monitor involvement and engagement in the platforms' modules and to enhance interaction between users, feedback was collected via a short survey after each module [14, 15].

Building A Community of Practice

A community of practice is a group of educators who engage in collective learning and share and develop new ideas and practices. Building a community of practice around the online professional development program engages educators and builds relationships that enhance participation and peer-to-peer learning. When educators explain their needs and discuss problems they face in their teaching practices, they come to a common understanding and build trust and community. As a result, educators should be encouraged to share their needs and build problems among their peers in the professional development community. These needs and problems should be aggregated into thematic areas, with knowledge and experience aligned for further discussion. Experienced educators may be invited to the community to mentor and coach these findings as they learn new approaches to solving the problems. Also, when educators share their expertise in their community and provide advice on how to implement these approaches, they become more effective at implementation. Each educator also finds an ally with whom to share their initial approaches and attempts, and discuss the experiences of their early endeavors. This will help them better implement the practice, as their peers provide moral support and additional feedback. In this community of practice, educators need to collectively arrive at a deeper understanding of the needs and problems to be effective. In these communities of practice, a design framework may be formulated for online teacher professional development communities. The framework defines online environments to facilitate a community of practice in three ways. The first is learning environments. This framework involves a range of online engagement tools and e-learning environments to facilitate community building, maintaining, and enriching as outcomes. The second is engagement processes to identify means to utilize available online environments to achieve the desired processes. Last is a volume of engagements. The diversity of engagements in various online environments in developing a community of practice has been investigated. The cross-influence among different types of engagements across online environments and within types of environments is identified along with the evolving nature of various engagements in a developing community of practice over time [16, 17].

Challenges in Online Professional Development

Inequalities in digital access for teachers have the potential to worsen disparities of opportunity and outcomes in student education. The inequitable access of teachers raised concerns as to how the digital divide gap between economic and racial groups would impact students' learning experiences and outcomes. A platform known as the "Teacher Circles" was created in response to a need for collaborative spaces for online professional learning and support. Its first iteration was during the COVID-19 Pandemic, and it provided nearly 800 teachers with professional learning centered on engaging students in science practices. Online platforms can feel overwhelming and isolating to teachers. Existing structures allow for teacher-to-teacher sharing but are often unstructured and lack focus. Building normal practices and unwritten rules is more difficult in an online space. Although platforms are often designed for collaborative learning, it is challenging to balance conversation with content delivery. Care is required as chat can often expose inequities in educator voice and opinion, while content discussions can spiral or become closed. Learning from one another in small groups in a relaxed setting, unsurprisingly, worked well, however, this added to the challenge of creating equitable spaces in the third iteration. The timing of breakout discussions can determine how dedicated teachers may be to attending the whole session. A 90-minute PD session was also seen as too short for the content. Questions around whether adjustments in online platforms should follow proven structures versus elements from previous iterations can also be asked. Worry over over-planning exists, as groups seem better at following organic flow. Planning content with no preparation can also be daunting, but platforms offered the opportunity to learn content while teaching, which proved beneficial. How to include content that the group would identify as important, but would take time, and deviation was also raised. It is hoped that the group members of the study were able to learn from others' experiences, similarly to the way they were able to learn with one another [18, 19].

Evaluating The Effectiveness of Online Platforms

As online learning platforms for teacher professional development (TPD) grow in developing countries, assessing their effectiveness becomes crucial. Education reform has emphasized creating scalable online communities for teachers. These platforms are popular due to their flexibility, allowing continuous reflection and improvement. However, there's limited investigation into their quality. Quality online

platforms are essential for positive learning outcomes. While technology can support ongoing professional development, many online communities struggle. Effective TPD design relies on understanding technology, resources needed, and teachers' requirements. Building a high-quality online TPD environment necessitates insight into teachers' perceptions, especially concerning quality issues. Solid empirical evidence is necessary for providers to enhance platform design and instruction. Understanding teachers' views on online professional development is vital for identifying strengths and weaknesses of platforms, contributing to knowledge of their characteristics. Numerous tools exist for evaluating web-based learning resources, yet no consensus instrument assesses the qualities of online learning environments. Research on evaluating online resources is abundant but often focuses on singular aspects of quality, leaving gaps in the literature for assessing blended learning platforms. While blended learning should enhance online education, existing evaluative criteria and qualitative studies do not readily inform understanding of learning platforms [20, 21].

Case Studies of Successful Platforms

Case Study of Platform A: The V-klub Learning Platform is part of the V-klub Learning Environment, established by the staff with a decision made in September 2007 and platform selection in May 2008. The ICT coordinator, contractor, and director managed the project, defining the contractor's selection, software, site architecture, user rights, and external knowledge acquisition. A project plan with 2010 milestones was created. The deputy principal wrote the learning provision plan, while the contractor and project manager handled the learning platform construction. V-klub staff collaborated on these plans, and smaller groups were formed for text writing, naming, internal marketing, tutorials, and user training to enhance staff knowledge and promote sharing. This process helped develop a shared understanding, enriching contributions, and fostering ownership of the learning platform's development. Case Study of Platform B: Digirefuge is an online professional development platform created for teachers, focusing on educational content collaboration. Designed with input from primary, secondary, and special education teachers during workshops, it aimed to be more than a materials database. Instead, it encourages teachers to collaboratively plan, create, and evaluate resources, providing an innovative online development space. Key features include pedagogical models, collaboration tools, self-evaluation, and diverse content integration. Recent changes shifted Digirefuge's focus from an environmental perspective to a broader wiki for educational resource reuse, evolving its vision, strategies, and activities.

Future Directions in Online Professional Development

Online professional development is crucial for addressing new teacher attrition, but requires more flexibility and options for participation across different contexts. Ensuring active participation and reflection among teachers in any format is essential. Social interaction among participants can enhance the effectiveness of online professional development. Furthermore, measuring its impact on instructional practice is vital to assess if objectives are met and to gather evidence on course effectiveness. Understanding changes in teachers' practices post-training can indicate successful development. Research on pedagogical perspectives and technology use in online professional development is necessary. A solid understanding of pedagogy aids course design, while insights into teachers' technology use inform adjustments to improve effectiveness. Different educational institutions delivering online mathematics professional development courses suggest further research in instructional methods and pedagogy. Future studies could investigate instructors' perceptions of specific technologies and their influence on teaching. Since initial research has yielded more practical than theoretical insights, a more comprehensive theoretical framework is needed. Understanding factors that enhance teacher participation and investment in online courses can help better address their needs and reduce dropout rates. Moreover, longitudinal studies covering a broader range of online development options and technology tools are essential to evaluate their impact on mathematics teaching and learning. With the increase in diverse online courses for math educators, both qualitative and quantitative research efforts are needed to ensure ongoing improvements and effectively address the impact of professional development [20, 22].

Funding and Sustainability

There were many known barriers to teachers accessing PD, but predominantly internet access and bandwidth were noted as significant impediments. Many teachers reported that their school had video conferencing machines but believed they were underutilised due to lack of training and knowledge amongst staff. Limited time and locations of PD offerings were also cited, particularly in relation to the availability of substitute teachers. Many PDs were still offered during the school day which made it difficult to attend. It is important to note that geographically remote teachers often have to rely on public transport or their own vehicles to access professional development events, hence events that were offered in the daytime were more challenging for those outside the metropolitan area. The way that online PD

was currently offered was difficult to find, and poorly advertised. Broader issues around moderation of online PD events usually led to confusion on how to access events and awareness of what was taking place where. Furthermore multiple video conferencing networks existed speculated that approximately 50 more schools typically added to their networks each year, this may have increased with further ongoing investment. However, there were many teachers not accessing the service, as it was reliant on teachers seeking it out, which was where the role of coordinators was so important. Outside of the regions, cost of events was becoming prohibitive. PD was cheaper, but still viewed as expensive compared to the travelling salesmen offering to travel to your school and hold free events. It was cautioned that if too many events were free, schools may refuse to pay and considered PD into three categories inexpensive, expensive and prohibitive. It was recommended to teachers that they never buy PD amongst concerns over ignoring the short teach contact and losing expertise in the marketplace. There were also difficulties in convincing reluctant teachers to attend online PD. Items that benefitted non-attendees could be perceived as less worthwhile. Such items needed to be presented with a strong rationale for relevance to the teacher's classroom and student needs. Teachers also needed to be given time initially to engage with the item and then opportunities to participate with these innovations before expecting ingrained changes in practice and a more self-sufficient teacher. Finally concerns were expressed that as online PD grew into a larger market of broadband practitioners, event quality may decline ever more rapidly. No longer viewing PD as an often ill-fitting but necessary evil. It was opined that a plethora of high quality free online PD could be on the way, as with any exponential growth phase, avid anticipation tinged with uncertainty [23, 24].

CONCLUSION

The development of effective online professional development platforms for educators demands more than merely digitizing traditional learning models; it requires thoughtful design that aligns technological tools, learning goals, and user needs. By emphasizing the importance of interactive content, supportive assessment mechanisms, and strong communities of practice, this study presents a framework for constructing impactful online PD experiences. Challenges such as digital inequity and platform engagement must be proactively addressed to ensure inclusive learning environments. Ongoing evaluation and adaptation based on educator feedback are vital to sustaining the quality and relevance of online PD offerings. Ultimately, well-designed online professional development platforms can empower educators, enhance instructional practices, and contribute significantly to improved student outcomes.

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