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TRANSFORMING EDUCATION, DRIVING INNOVATION AND
ADVANCING LIFELONG LEARNING FOR EMPOWERED WORLD

COMPETENCY-BASED VIDEO CONFERENCING EDUCATION SUITE (CoViCES)

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ABSTRACT

The Competency-Based Video Conferencing Education Suite (CoViCES) addresses the challenges of synchronous online and hybrid teaching, which became critical during the COVID-19 pandemic and remain relevant in the digital education era. Existing video conferencing platforms often lack pedagogical integration, hindering engagement and effective online teaching. CoViCES offers a comprehensive solution through innovations on: a) Video Conferencing Toolkits combining technology with pedagogical best practices, b) Open Educational Resources (OERs) on both technical and instructional aspects for virtual classroom, c) Competency matrices outlining key digital and pedagogical skills required for effective participation in virtual classrooms, d) self-assessment tools to evaluate proficiency, track progress, and identify areas for improvement, and e) a reproducible Educator Training Workshop Model for scalable implementation. Developed through Design Thinking methodology, CoViCES follows an iterative, user-centered process which empathizes with stakeholders, defining challenges, ideating solutions, prototyping toolkits, and testing them in real-world educational settings across Asia and Europe. This approach ensures that the solutions are practical, context-sensitive, and pedagogically robust. The novelty of innovations includes culturally adaptive toolkits that address regional teaching practices and technological constraints, competency frameworks specifically designed for synchronous video-based learning, filling a critical gap in digital education standards, and Sustainable training models that empower educators to become effective online instructors and trainers. Aligned with SDG 4 (Quality Education) and SDG 10 (Reduced Inequalities), CoViCES enhances digital teaching efficiency, student engagement, and institutional readiness for hybrid learning. Short-term impacts include improved local practices, while long-term sustainability is ensured through open-access resources, institutional integration, and global dissemination.

Keywords: Video Conferencing Platform; challenges; online teaching and learning, innovation

INTRODUCTION

The COVID-19 pandemic era compelled educational institutions worldwide to rapidly transition to hybrid or fully online formats. This shift was not merely a temporary adjustment but a fundamental transformation in how education was delivered. Schools, colleges, and universities had to adapt overnight to digital platforms in order to continue teaching and learning amid widespread lockdowns and social distancing measures.

In the post-COVID era, online and hybrid teaching models remain relevant and are increasingly promoted as part of a broader shift towards a digital economy. The flexibility and accessibility offered by these formats align with emerging educational and workforce needs, enabling institutions to reach a broader and more diverse student population. However, the ongoing integration of digital instruction also brings several challenges that impact teaching effectiveness and learner engagement.

One significant issue is that video conferencing tools and platforms often fail to replicate critical elements of in person teaching. Aspects such as board work, gestures, non-verbal cues, and real-time interactivity are either diminished or lost entirely in virtual environments. As a result, educators are frequently forced to rely on multiple devices or external applications to bridge these gaps, which increases their cognitive and logistical load.

Another major challenge lies in addressing contextual differences across disciplines and student populations. Subject-specific needs such as lab-based courses requiring hands-on experimentation versus theory-based courses, are difficult to accommodate in a standardized online format. Additionally, language barriers and varying communication styles among diverse student groups further complicate effective teaching and learning (Ling et al., 2024).

The shift to digital education also demands new competencies from educators, including proper camera setup and positioning, effective use of body language to maintain engagement, and skilful management of synchronous online tools. Meanwhile, students often struggle with disengagement due to reduced interactivity, screen fatigue, and a lack of peer connection or classroom presence (Ling et al., 2024). These factors collectively diminish the learning experience and outcomes.

These challenges underscore the need for context-aware technological and pedagogical solutions that go beyond one-size-fits-all platforms. There is also a pressing need for the systematic dissemination of innovative teaching practices and the development of inclusive, engaging strategies tailored to online learning environments. Addressing these issues will be crucial in ensuring that digital education remains effective, equitable, and sustainable in the long term.

OBJECTIVE

The objectives of the project are:

1. To improve synchronous online and hybrid teaching by:
 - a. Developing two educational video conferencing toolkits.
2. To enhance the quality and efficiency of education globally through:
 - a. Creating comprehensive, high-quality materials on educational video conferencing, to be published as Open Educational Resources (OERs).
 - b. Developing tailored competence matrices for both educators and students, outlining the essential skills for effective video conferencing-based education.
 - c. Designing and validating the Video Conferencing Competency Skills (VCCS) instrument.

3. To build the capacity of educators to become effective online and blended instructors or teacher trainers by:
 - a. Designing an Educator Training Workshop Model.

THEORIES

Design thinking is an innovation methodology centered around human needs. It focuses on observing user behavior, encouraging collaboration, promoting rapid experimentation and learning, visualizing concepts, prototyping ideas quickly, and aligning these with business objectives.

As illustrated in Figure 1, design thinking is a structured approach that draws upon the intuitive and creative abilities of designers to align user needs with what is technologically achievable and strategically viable, thereby generating value for both customers and businesses (Brown, 2008). It is also recognized as a human-centered methodology for tackling complex, ill-defined problems. The process begins by deeply understanding users' perspectives and relies on cross-functional collaboration. This teamwork involves a dynamic interplay of cooperation and constructive conflict, where the clash of ideas often sparks innovative outcomes (Fleury et al., 2016). Today, design thinking is widely seen as a cyclical, integrative method closely linked to innovation and business development.

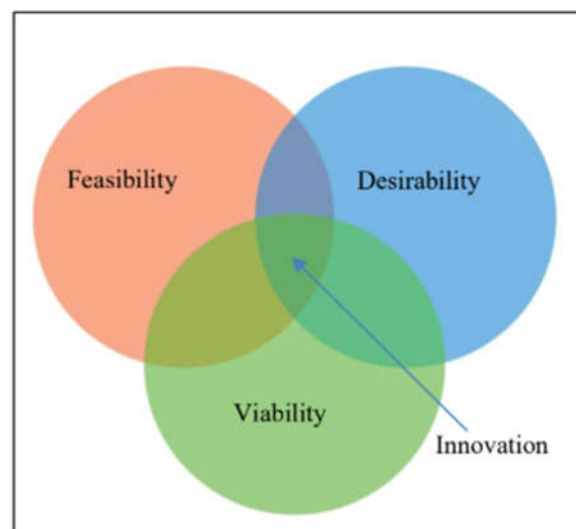


Figure 1. Design thinking (Adapted from Ishio, 2018, p.4)

Mueller-Roterberg's (2018) proposed design thinking model which consists of six iterative phases. The first three phases fall under the problem space, while the remaining three belong to the solution space.

The first phase is Understanding, which involves developing a deep comprehension of the challenge, problem, need, or requirement. The second phase is Observation, where detailed research and on-site investigations are conducted to explore the customer's needs or problems (Mueller-Roterberg, 2018, p. 5). The insights gathered from the first two phases are then synthesized and clearly articulated in the

third phase, Point of View, where the core problems are defined. The fourth phase is Ideation, where brainstorming sessions are held to generate creative solutions to the defined problems. In the fifth phase, Prototyping, the proposed ideas are evaluated, and the most promising ones are selected and developed into prototypes. The final phase is Testing, in which the prototypes or ideas are tested, analyzed, and refined based on feedback.

In contrast, the Hasso-Plattner Institute of Design (Dam & Siang, 2019) proposes a five-stage design thinking model, where the second phase of Mueller-Roterberg's model is integrated into the first phase of their framework and name it Empathize phase. This study adopts the design thinking approach proposed by Dam and Siang (2019).

METHODOLOGY

The methodology used in the project is the Design Thinking approach, which serves as the driving force behind the project's innovation. This approach is structured into five key phases: Empathize, Define, Ideate, Prototype, and Test.

In the Empathize phase, insights were gathered from educators, students, and instructional designers through interviews, surveys, and observations. The goal was to gain a deep understanding of the real-world challenges associated with using video conferencing for teaching and learning.

During the Define phase, the team identified core problems and needs related to synchronous online teaching.

These included technological limitations, pedagogical gaps, and issues related to user engagement. Clearly defining these challenges helped to focus the subsequent design efforts.

In the Ideate phase, a wide range of creative solutions was generated through brainstorming sessions and collaborative design workshops. The possible solutions were suggested to ensure they were both practical and pedagogically relevant, reflecting the diverse needs of the intended users.

The Prototype phase involved developing and refining multiple innovations related to the video conferencing. These prototypes integrated both technological features and pedagogical best practices and were tailored to address a variety of educational contexts across Asia and Europe.

Finally, in the Test phase, the innovation products were piloted in real teaching and learning environments. Feedback from educators and students was collected to assess the toolkits' usability, adaptability, and effectiveness. The insights gathered during this phase informed further refinement of the toolkits, ensuring they met the needs of diverse users in actual classroom settings.

FINDINGS

The study developed two sets of video conferencing toolkits: one specifically designed for fully online learning, and the other for hybrid learning environments. These toolkits were created by ideating solutions to address both pedagogical and technological challenges associated with video conferencing in education.

To support global efforts in improving the quality and efficiency of education, ten high-quality Open Educational Resources (OERs) on educational video conferencing were produced. In addition, competence matrices for both educators and students were developed, outlining the essential skills required for effective video conferencing-based education. These matrices were further refined into the Video Conferencing Competency Skills (VCCS) instrument. The instrument underwent expert validation, and its reliability was confirmed with a Cronbach's Alpha score of 0.85.

To enhance educators' capacity to teach effectively in online and hybrid settings, an Educator Training Workshop Model was developed. This model was pilot tested in Malaysia, Thailand, Bangladesh, and Denmark, demonstrating its applicability across diverse educational contexts.

NOVELTY & INVENTIVENES

The project introduces seven key novelties and inventive elements that set it apart from existing initiatives in the field of online and blended education. First, it features a transcontinental collaboration between institutions in Asia and Europe. This partnership is unique in its effort to integrate diverse cultural and pedagogical perspectives, ensuring that the project's outcomes are globally relevant and inclusive. Second, the project offers culturally-aware video conferencing toolkits. These toolkits are not one-size-fits-all; they are aligned with pedagogical best practices and tailored to different cultural contexts, addressing the diversity of global education systems.

The third novelty and inventiveness is the integrated pedagogical and technological training. Unlike traditional frameworks that separate these two areas, this training equips educators with both the technical skills and the pedagogical knowledge needed for effective synchronous online teaching.

The fourth is open-access video conferencing modules, which are made available as Open Educational Resources (OERs). These high-quality materials are freely accessible, promoting broad global adoption and contributing to the achievement of the Sustainable Development Goals (SDGs).

The fifth is the custom competency matrices designed specifically for both educators and students. These frameworks fill a significant gap by focusing on the unique skills needed for video conferencing-based teaching and learning.

The sixth is a novel self-assessment tool, the Video Conferencing Competency Skills (VCCS) instrument. It helps users reflect on and evaluate their video conferencing skills both before and after training, supporting ongoing personal and professional development.

Finally, the reproducible educator training workshop model is scalable and adaptable, making it suitable for use in various institutional and cultural settings. It ensures the long-term sustainability and impact of the training provided.

PRACTICALITY, USEFULNESS AND IMPACT

The project is grounded in practical implementation, with all materials and tools designed to be directly usable and adaptable across a wide range of educational settings. The transcontinental collaboration ensures that solutions reflect both global and local realities, making the outputs culturally and contextually relevant. The video conferencing toolkits and training modules are modular and scalable, allowing institutions to adopt them regardless of size, infrastructure, or resources. Furthermore, the self-assessment instruments and competency matrices are user-friendly and require minimal technical expertise, making them practical for immediate deployment in both formal and non-formal education environments.

The project offers useful resources that respond directly to the needs of educators and learners engaged in synchronous online or hybrid learning. By combining pedagogical depth with technical training, the materials help users develop both the skills to use video conferencing tools effectively and the strategies to teach meaningfully through them. The inclusion of tailored competency matrices provides clear guidance on expectations and skills progression, while the VCCS instrument encourages self-reflection and goal setting. Open Educational Resources (OERs) further enhance usefulness by enabling institutions to integrate and adapt content with minimal barriers, supporting continuous professional development.

The potential impact of this project is significant and far-reaching. Improving the quality and accessibility of synchronous online education contributes directly to advancing global educational equity and the Sustainable Development Goals (particularly SDG 4: Quality Education). The culturally responsive approach bridges educational practices between Asia and Europe, fostering mutual understanding and collaboration. The scalable training model ensures long-term capacity building for educators, while the open-access nature of the resources maximizes reach and sustainability. Ultimately, the project equips both educators and students with the competencies needed to thrive in modern, digitally mediated learning environments.

POTENTIAL FOR COMMERCIALISATION

The project holds strong potential for commercialisation through the development of value-added services and customized offerings built around its core educational resources. While the foundational toolkits and modules are offered as Open Educational Resources (OERs), premium versions can be monetized through advanced features such as LMS integration, multilingual support, and institutional customization. The Video Conferencing Competency Skills (VCCS) instrument can be developed into an online version for educators and students, opening up opportunities for revenue through usage fees.

Additionally, the Educator Training Workshop Model can be offered to educational institutions and governments as part of professional development services. Further commercial potential lies in offering consultancy and implementation services tailored to the needs of schools, universities, or ministries of education, especially in emerging markets where digital teaching capacity is still developing.

CONCLUSION

In conclusion, the project not only addresses a critical global need for effective, culturally responsive video conferencing in education but also demonstrates clear pathways for sustainable growth through commercialisation. By offering a mix of open-access resources and scalable value-added services—such as certifications, professional training, and customizable implementations—it strikes a balance between public good and market viability. The innovative nature of its tools, combined with global applicability and institutional relevance, positions the project to generate long-term educational impact while also creating opportunities for revenue generation and strategic partnerships within the global EdTech ecosystem.

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