Researching Communities of Practice when transitioning In-service Educator Training to Blended Learning

Investigando comunidades de práctica al hacer la transición de la capacitación de educadores en servicio al aprendizaje combinado

Cristo Ernesto Yáñez León, New Jersey Institute of Technology, Estados Unidos, leonc@njit.edu (autor corresponsal)

James M. Lipuma, New Jersey Institute of Technology, Estados Unidos, lipuma@njit.edu

Saikat Pal, New Jersey Institute of Technology, Estados Unidos, saikat.pal@njit.edu

Resumen

El Departamento de Educación de Nueva Jersey buscó desarrollar una comunidad de aprendizaje profesional en línea para 150,000 educadores en casi 600 distritos escolares. Los autores presentan un análisis posterior al proyecto del proyecto desarrollado en apoyo de situaciones de aprendizaje presencial, semipresencial y completamente en línea. Este proyecto creó un "Intercambio de aprendizaje profesional en línea" con módulos de aprendizaje en línea combinados y fue financiado con más de dos millones de dólares. La mayor fortaleza de la herramienta OPLE es ayudar al estado de New Jersey a cambiar su capacitación de la entrega experta de conocimiento en un formato cara a cara hacia la Comunidad de Práctica. El artículo presenta una Revisión Sistemática de la Literatura, el análisis de los Métodos de Aprendizaje y Capacitación Profesional, una descripción de los Métodos para crear Módulos de Aprendizaje Combinado enfocados en videos, materiales escritos, encuestas y discusiones. A través de este enfoque integrado, OPLE permite que el usuario domine conceptos que mejoran su capacidad para brindar una instrucción más eficiente y efectiva a sus estudiantes. Finalmente, el artículo concluye con los resultados e implicaciones a la luz de los desarrollos mundiales actuales y su impacto en la educación.

Abstract

The New Jersey Department of Education sought to develop an online professional learning community for 150,000 educators in nearly 600 school districts. The authors present a post-project analysis of the project developed in support of Face-to-Face, Blended, and fully online learning situations. This project created an "Online Professional Learning Exchange" with blended online learning modules and was funded with over two million dollars. The greatest strength of the OPLE tool is to aid the state of NJ to shift their training from expert delivery of knowledge in a face-to-face format towards the Community of Practice. The paper presents a Systematic Review of the Literature, the analysis of Professional Learning and Training Methods, a description of the Methods to create Blended Learning Modules focused on video, written materials, polls, and discussions. Through this integrated approach, the OPLE allows for user mastery of concepts that enhance their ability to provide more efficient and effective instruction to their students. Finally, the paper concludes with the results and implications in light of the current world developments and their impact on education.

Palabras clave: aprendizaje combinado, Comunidades de Práctica (CdP), modelo GPS, Investigación de Métodos Mixtos (IMM)

Key words: blended learning, Communities of Practice (CoP), GPS model, Mixed-Method Research (MMR)

1. Introduction

In America, Professional Development (PD) for K-12 educators has traditionally consisted of lecturing and workshops presentations. The projects featured in the paper, however, leverage current technologies, relevant research (Adinda & Mohib, 2020; Blitz, 2013, pp. 2013–003; Koller et al., 2005), and experience in Blended Learning in order to deliver content in an engaging manner and allow teachers greater control over their PD experience. This paper presents a post-project evaluation of the creation of an online training system in the state of New Jersey USA for its nearly 600 school districts. The New Jersey Institute of Technology (NJIT) was awarded a series of grants to Dr. James Lipuma from the New Jersey Department of Education (NJDOE) Document ID # 324-201-50025, to gather a team and manage the creation of digital materials and videos to create an online professional development repository and tool for educators. Cristo Leon, MBA assisted with Project and Strategic Planning Design. This project created blended online learning modules and was funded with over two million dollars from September 2014 to November 2015 with its intellectual property rights ending in December 2021. The current article presents the analysis conducted from January 2022 to May 2022.

2. Development of Networks and Communities of Practice

The NJDOE sought to develop an online professional learning community for 150,000 educators in nearly 600 school districts. This article provides a post-project analysis of the "Online Professional Learning Exchange" (OPLE) with blended online learning modules to support Face-to-Face, Blended, and fully online learning situations. The article draws on collaborative models (Calvo & Sclater, 2021; Catana et al., 2021; DuBow et al., 2018; Shrum et al., 2007).

2.1 Professional Development

Traditionally PD activities involve educators passively absorbing information delivered via lecture. However, blended learning techniques integrate digital technology into learning experiences to improve learning. Thus, the space and time are not the limiting factors of learning.

2.2 Objective

The goal of the OPLE construction was to create a platform to convey a fixed set of materials and allow other initiatives to generate effective PD for in-service teachers.

Key resources included videos of practitioners implementing the types of lessons accompanied by lesson plans and voice-over commentaries from the educators featured, the administrators who would be evaluating them, and outside subject matter experts where appropriate. These skill-building tutorials were accompanied with lesson plans and instructional information on the teaching practice activity, or formative tool.

3. Theoretical framework

Our retrospective review of the materials provided is a mixed-method approach. We had exploratory elements to determine effective practices utilized in the OPLE. Subsequently, as the authors continued research into communities of practice and the collaborative convergence research approach, new insights were discovered. The collaborative convergence pyramid is a framework to analyze and understand large system change initiatives involving large numbers of stakeholders and partners from multiple sectors with varying levels of engagement and interest. In this case, the OPLE was working to change the system of education leveraging a range of public, private, and non-profit, partners as well as many stakeholders from society represented by educators and administrators.

During the creation of the OPLE, the ADDIE model was utilized to guide the methodology of investigation. First, the needs of OPLE purpose and target participants were explored and the "needs assessment" was conducted. Next, the OPLE went through iterative design and development based on best practices in the literature. The researchers conducted pilot testing with focus groups to identify updates during the implementation phases as the user interface and content were optimized. Finally, as the full system was rolled out the evaluation of the content and delivery by the sponsor and participants was handled with surveys and observations. The researchers returned to the provided system to examine the analytical data and the resulting work with the new paradigm of collaborative convergence pyramid framework. This allows for a more in-depth examination of the community of practice and multi-sector stakeholder group collaboration. Through an understanding of the need for a collaborative framework and value to drive community participation in the learned practices, a new perspective provides novel insights on this project and ones similar to that.

4. Participants

Leaders like the NJ commissioner of NJDOE, director of the Principals Supervisor's Association, and representatives of other state agencies and educational interest groups worked with Dr. Lipuma and his team from CLEAR to co-design the work. The Pilot tests with the educational stakeholders informed the work. IN the end, there were over 10,000 participants in the tests, and the videos that comprise the persistent presence of the OPLE have had a varying level of views on YouTube ranging from under 100 to nearly 100,000. The project cannot disclose specific data or user details as the authors do not have permission to share disaggregated data or other aspects of the research. Due to the IRB restrictions and the contract between NJIT and NJDOE, we cannot disclose details of the participants, intellectual property, or other development elements now owned by the state of New Jersey.

5. SRL review

A "systematic review of the literature (SRL) was utilized as the strategy for identifying the most relevant studies" (Ramírez-Montoya & García-Peñalvo, 2018) on the field of Pedagogical Content Knowledge drawn from three specific fields of research: Education, Administration, and Information and Communication Technology (ICT). (Higgins et al., 2019; Brereton et al., 2007; The results of the SLR served as a referential mapping tool to identify the most important sources. The GPS model yielded the most influential articles.

6. Blended PD

Beyond just Blended learning educators should be encouraged to establish online communities of practice (Gray & Smyth, 2012; Holmes et al., 2011; Riveros et al., 2012). This mode takes many forms (Alammary et al., 2014) depending on how the process is implemented allowing students to control the time, place, pace of learning. In the simplest sense, blended learning adds technology tools to augment face-to-face instruction. However, at more advanced levels, these tools for digital learning allow the instructor to expand contact time beyond the synchronous classroom in order to provide the students the opportunity to work through activities (Chen, 2012), access resources, have a forum for discussion and/or engage with class materials, peers, or professors and other professionals at their own time and in ways that best fit the style and pace of learning of the individual student. For educators

this integration may not be accepted nor seem seamless. Many educational training providers offer live webinars that allow for questions, answers, and feedback. Videos of these events may be made available for review after the event. One significant drawback to these videos is that it is difficult to easily locate specific materials for convenient and efficient review. This issue can be solved with videos that are pre-sourced by the PD provider, or when those are not available, learning objects that are tailor-made for the PD session by the provider directly.

Often educators search the open web for resources, requiring investment of time. What is found lacks focused, can be out of context, and is rife with inaccuracies or errors having rarely been vetted or peer reviewed The OPLE model was designed to overcome these issues. This project developed a range of video types that effectively allow educators to learn content, see demonstrations, access examples, and share their ideas and questions with the group. "Videos play a vital part in the enhancement of education. They can explain content in a wide variety of ways for different learning styles and be accessed at any time and in any place. Video allows students to review content as many times as needed, stop to take notes or see material for the first time if they missed class. "Video allows educators access to demonstrations and explanations that might not be available otherwise due to limits on time, resources, access, or even safety issues" (Lipuma & Reich, 2016). "In conjunction with video and other materials to create knowledge objects, the activities and assessments combine to create persistent learning objects aligned for effective education" (Biggs, 1996; Kirby & Lawson, 2012).

7. Rationale and results

The OPLE allows for user mastery of concepts that enhance their ability to provide more efficient and effective instruction to their students. Users that are progressing faster will be able to access the next sets of learning objects and move onto the next section, while other users may choose to review portions of the material several times until they are comfortable with the content. Some users may choose to make use of the various available resources that extend or delve deeper into the material. Using this technology enables the learner to be more self-directed and informed instructors for the given content. An important aspect of an OPLE is the continued development of more modules

and content. OPLE content can be disciplinary in nature in order to deepen educator knowledge of content, aid their pedagogy, and/or assist in curriculum planning. Moreover, OPLE can be more than just a tool for training. It can facilitate effective engagement of educators in communities of practice. These efforts can assist Professional Learning Communities (PLCs) in working together to unpack standards and develop curriculum, breaking it into units, and working their way down to lessons that better align instruction with desired student learning outcomes.

7.1 Discussion of results

There are numerous benefits to the approach taken by the OPLE project over many traditional forms of PD. The OPLE model enhances traditional PD by allowing the individual learner to control the PD experience and enhance small group PLCs by adding a blended learning component while integrating isolated PLCs into the larger online community. The goals and content of each module are contextualized and vetted so that the educator does not need to search the Web and filter out a large amount of irrelevant information to find information that they need. Users may choose to view the material as often as they like.

The project materials have been provided openly to the public via the "Blended Online Learning Modules" NJ DOE website (Department of Education, 2020) as well as the "Curriculum Learning and Assessment Studies (CLAS) Network YouTube Channel" (Lipuma, 2015).
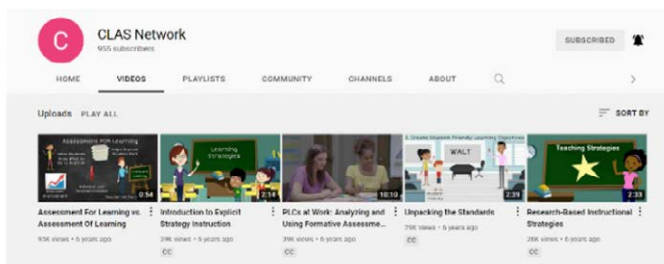

Figure 1. CLAS Network—YouTube.

Groups of educators may use modules at the same time and place to guide the discussion of concepts and topics. All districts in NJ were provided access to the materials synchronously and asynchronously which reached 20,000 total users. These each represented different groups of educators and administrators using the materials. Its users regularly access the OPLE for content and as a

way to facilitate and manage conversations. However, in the end, it was found that without the key elements for an effective community of practice, pockets of users gained the content knowledge but did not continue the interactions once the oversight was removed and key concepts in the content were learned. The key factors in effective Community of Practice (CoP) according to the literature review (Pyrko et al., 2017; Tucker & Seavey, 2018; Wenger, 2000) are: Mutual engagement, Joint enterprise, and Shared repertoire.

7.2 Considering sustainability

One key aspect of building and maintaining a community of practice is the value added that serves the interest of the participants. without new value or new participants, PD will eventually reach saturation. With the advent of YouTube and social media simple OPLE can expand to a channel.
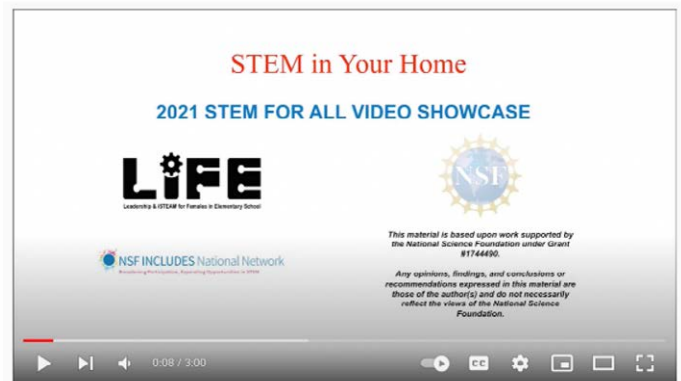

Figure 2. STEM for all showcase submission.

An example of content is the STEM for All video (see Figure 2). This is based on the authors NSF INCLUDES project and other on-going outreach work at NJIT. One example of this is the work of Dr. Saikat Pal from NJIT. He and his BioMedical Engineering undergrads and graduate students created videos in support of STEM. He conducts virtual tours of his laboratory for classes to show stem in action. This work also had done outreach to schools in person before COVID-19

7.3 Current application of Virtual PD

There are several outgrowths of this work that would allow for greater value-added to communities of practice. Many educators and administrators requested access to the spaces and subject matter experts in order to gain a better understanding of the work being done at universi-

ties and corporations. Several virtual tours and outreach activities have been undertaken. Due to the disruption of the COVID-19 outbreak in NJ, many of these have been virtualized. For example, Dr. Pal had visited schools, sent undergraduates, and graduate students to schools to assist with PD. His students now create videos and run live stream events for teachers and students. Virtual tours of the NJIT maker space and his lab are available both asynchronously and in a hosted modality to allow educators to see these applications in practice and ask questions. These and other such opportunities are a direct outgrowth of the work on the OPLE and the desire of r educators to interact directly with SEM professionals and have their students see the real-world application of the lessons being taught and the standards being attained.

8. Conclusions

Any effective community of learners like the OPLE must foster communities to engage and add value for members. The OPLE also will be an effective medium for sharing best practices and seeking help from colleagues and experts. The greatest strength of the tool is to aid the state of NJ to shift their training from expert delivery of knowledge in a face-to-face format towards the community of practice model. In this way, the best practices and research around how to more effectively engage and grow interest in the community can lead to sustainable and scalable results over time. The initial charge given for the creation of the OPLE was to include the community-building tools of online learning. This was supported with ongoing activities by the end of the five-year life cycle of the project, 20,000 users had engaged with the materials but once training succeeded in providing the needed learning, the learning objects became a resource rather than a springboard to a vibrant community of practice. Further discussions and research, has to be conducted to examine the idea that an OPLE can be a catalyst for a community of practice.

References

Adinda, D.; Mohib, N. (2020). Teaching and Instructional Design Approaches to Enhance Students' Self-Directed Learning in Blended Learning Environments. *Electronic Journal of E-Learning*, *18*(2), 162–174.

Alammary, A., Sheard, J.; Carbone, A. (2014). Blended learning in higher education: Three different design approaches. *Australasian Journal of Edu-cational Technology*, *30*(4), Article 4. https://doi.org/10.14742/ajet.693

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher Education*, *32*(3), 347–364. https://doi.org/10.1007/BF00138871

Blitz, C. L. (2013). Can Online Learning Communities Achieve the Goals of Traditional Professional Learning Communities? What the Literature Says. REL 2013-003. In *Regional Educational Laboratory Mid-Atlantic*. U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Mid-Atlantic. https://eric.ed.gov/?id=ED544210

Brereton, P.; Kitchenham, B. A.; Budgen, D.; Turner, M.; Khalil, M. (2007). Lessons from applying the systematic literature review process within the software engineering domain. *Journal of Systems and Software*, *80*(4), 571–583. https://doi.org/10.1016/j.jss.2006.07.009

Calvo, M.; Sclater, M. (2021). Creating Spaces for Collaboration in Community Co-design. *International Journal of Art & Design Education*, *40*(1), 232–250. https://doi.org/10.1111/jade.12349

Catana, C.; Debremaeker, I.; Szkola, S.; Williquet, F. (2021). *The communities of practice playbook: A playbook to collectively run and develop communities of practice*. Publications Office. https://op.europa.eu/publication/manifestation_identifier/PUB_KJNA30466ENN

Chen, W.-F. (2012). An investigation of varied types of blended learning environments on student achievement: An experimental study. *International Journal of Instructional Media*, *39*(3), 205-.

Davis, A. L. (2013). Using instructional design principles to develop effective information literacy instruction: The ADDIE model. *College and Research Library News*, *74*(4), 205–207. https://doi.org/10.5860/crln.74.4.8934

Department of Education. (2020). *Blended Online Learning Modules*. https://www.state.nj.us/education/atoz/bolm.shtml

DuBow, W.; Hug, S.; Serafini, B.; Litzler, E. (2018). Expanding our understanding of backbone organizations in collective impact initiatives. *Community Development*, *49*(3), 256–273. https://doi.org/10.1080/15575330.2018.1458744

Frey, B. B. (2018). *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation* (1st ed.). SAGE Publications, Inc. https://doi.org/10.4135/9781506326139

Gray, C.; Smyth, K. (2012). Collaboration Creation: Lessons Learned from Establishing an Online Professional Learning Community. *Electronic Journal of E-Learning*, *10*(1), 60–75.

Higgins, J.; Thomas, J.; Chandler, J.; Cumpston, M.; Li, T.; Page, M.; Welch, V. (Eds.). (2019). *Cochrane Handbook for Systematic Reviews of Interventions* (2nd ed.). John Wiley & Sons. www.training.cochrane.org/handbook

Holmes, A.; Signer, B.; MacLeod, A. (2011). Professional Development at a Distance: A Mixed-Method Study Exploring Inservice Teachers' Views on Presence Online. *Journal of Digital Learning in Teacher Education*, *27*(2), 76–85.

Kirby, J.; Lawson, M. (2012). *Enhancing the quality of learning: Dispositions, instruction, and learning processes* (p. 397). https://doi.org/10.1017/CBO9781139048224

Koller, V.; Hervey, S.; Magnotta, M. (2005). *Technology-Based Learning Strategies*. Social Policy Research Associates. https://www.doleta.gov/reports/papers/tbl_paper_final.pdf

Lipuma, J. (2015, August 31). *CLAS Network: YouTube Channel* [YouTube Channel]. https://www.youtube.com/channel/UCo79HYfMxJ75TDO0DxQwHsw/videos?app=desktop&view=0&sort=p&flow=grid

Lipuma, J.; Reich, J. (2016). *Categorization of Video Used in a Digital Learning Online Professional Learning Exchange for Professional Development by the State of New Jersey*. 79–85. https://www.learntechlib.org/primary/p/172712/

Newman, M.; Gough, D. (2020). Systematic Reviews in Educational Research: Methodology, Perspectives and Application. In O. Zawacki-Richter, M. Kerres, S. Bedenlier, M. Bond, & K. Buntins (Eds.), *Systematic Reviews in Educational Research: Methodology, Perspectives and Application* (pp. 3–22). Springer Fachmedien. https://doi.org/10.1007/978-3-658-27602-7_1

NJDOE. (2020). *Department of Education Homepage*. https://nj.gov/education/

Office of Educational Technology. (2014). *Exploratory Research on Designing Online Communities of Practice for Educators to Create Value*. https://tech.ed.gov/designing-online-communities-of-practice/

Pyrko, I.; Dörfler, V.; Eden, C. (2017). Thinking together: What makes Communities of Practice work? *Human Relations*, *70*(4), 389–409. https://doi.org/10.1177/0018726716661040

Ramírez-Montoya, M.-S.; García-Peñalvo, F. (2018). Co-creation and open innovation: Systematic literature review. *Comunicar*, *54*, 9–18. https://doi.org/10.3916/C54-2018-01

Riveros, A.; Newton, P.; Burgess, D. (2012). A Situated Account of Teacher Agency and Learning: Critical Reflections on Professional Learning Communities. *Canadian Journal of Education*, *35*.

Rock, P. (2020, February 24). Communities of Practice – Virtual learning and collaboration opportunities. *Participate Learning*. /blog/communities-of-practice/

Shrum, W.; Genuth, J.; Chompalov, I. (2007). *Structures of Scientific Collaboration*. The MIT Press. https://mitpress.mit.edu/books/structures-scientific-collaboration

Tucker, C.; Seavey, T. (2018, October 26). Cultivating Communities of Practice. *Dr. Catlin Tucker*. https://catlintucker.com/2018/10/communities-of-practice/

Vu, P.; Cao, V.; Vu, L.; Cepero, J. (2014). Factors Driving Learner Success in Online Professional Development. *International Review of Research in Open and Distance Learning*, *15*(3), 120–139.

Wenger, E. (2000). *Communities of Practice: Learning, Meaning, And Identity* (1st ed.). Cambridge University Press.

Zawacki-Richter, O.; Kerres, M.; Bedenlier, S.; Buntins, K. (Eds.). (2020). *Systematic Reviews in Educational Research: Methodology, Perspectives and Application*. Springer Fachmedien. https://doi.org/10.1007/978-3-658-27602-7_1