

# New framework could help teachers personalize their professional learning

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In a study recently published in *Educational Technology Research and Development*, Penn State researchers propose the conceptual framework of digital badging system components as cultural tools—which serve to mediate interactions between people and their goals—that allows learners to personalize their professional development by making decisions about what they want to learn and when. Credit: NASA Aerospace Education Services Project

Digital badges used as emblems to indicate an accomplishment or skill is a concept familiar to online learners seeking advanced knowledge in their profession. For many learners, digital badges have been used as a motivation to continue along a prescribed path—often through workshop attendance or completion of required online learning modules.

But what about independent or self-guided learners who may wish to study certain topics or complete learning at their own pace? In a study recently published in *Educational Technology Research and Development*, Penn State researchers propose the conceptual framework of digital badging system components as cultural tools—which serve to mediate interactions between people and their goals—that allows learners to personalize their professional development by making decisions about what they want to learn and when.

"Having a level of [ownership](#) in your learning creates an environment to help with being successful," said Chris Gamrat, instructional designer in the Penn State College of Information Sciences and Technology and lead author of the study. "We are pretty good at creating experiences where there's a prescribed pathway. But I think that there's going to be more need for agility in learning moving forward."

In the design-based research study, Gamrat and Heather Toomey Zimmerman, professor of education, observed the professional development activity of 59 elementary and middle school teachers of science, technology, engineering and math (STEM) courses through an online learning system during two three-month summer sessions, held one year apart. The system, developed in 2012 as a collaboration between NASA, the National Science Teaching Association, and Penn State, was designed to help teachers plan for, pursue and receive recognition for STEM education professional development activities.

Gamrat and Zimmerman examined how teachers planned and navigated

various learning modules, and collected data on their progress, as well as their intended and completed professional activities. Specifically, they explored how learners identified their learning goals and the path they took to achieve them.

Zimmerman said digital badging provides new opportunities for personal development.

"Digital badges allow learners to personalize their educational experience to focus on their unique professional goals as they maximize their own expertise. Because learners can access the digital badges from their phone, tablet or computer, digital badges become a tool for people to learn on the job in various ways."

In the first iteration, teachers were encouraged to write a goal statement to help point them in a direction to pursue their professional learning. In the second iteration, with updates to the learning system based on first session feedback, an orientation activity was added to introduce a badging system and to help participants identify and organize the learning activities they wanted to accomplish.

The researchers found that teachers who completed both a goal statement and orientation activity achieved a significantly higher number of activities compared to those who completed only the goal statement. They also found that teachers using the first iteration of the system identified their goals mostly based on available topics, while participants in the second session were interested in expanding knowledge of topics both within and outside of the system's library—suggesting their desire to expand their learning to meet their cross-curricular goals and needs.

The researchers also found that teachers' navigation of the digital badging system differed from the intended design in terms of how they selected and completed learning activities. Additionally, the teachers

accessed the system in three distinct time-based patterns: those who used the system for a number of consecutive days, demonstrating an immediate need and pursuit of professional development; those whose participation ebbed and flowed over the course of three months; and those who completed some activities then returned to continue learning after months of nonuse.

According to Zimmerman, an important aspect of the research are the suggestions for educational institutions that want to offer personalized learning experiences for their employees or volunteers.

"A key finding was more structure in the learning activities did not always provide better learning outcomes," she said. "By providing open pathways for learners in our badging system, some people create unique ways of using the system to meet their distinct needs—beyond what we thought of as designers. Space to individual learning is important."

The findings could inform design considerations for independent teacher professional development systems, making activity choice more flexible and encouraging learners to complete more professional learning activities. The work also encourages researchers to use sociocultural learning theory to consider the design of digital badges and how they can be used for personalized learning.

According to Gamrat, these recommendations could benefit not only the teacher-learners who are pursuing the knowledge, but also the individuals with whom they work and teach.

"When working with NASA, we believed that by helping teachers grow and learn, you're creating this multiplier effect, because each of those teachers that you're helping is impacting hundreds of students," said Gamrat. "If we're giving learners better technological tools, we're actually able to positively impact more people."

The work was supported by NASA's Aerospace Education Services Project.

**More information:** Chris Gamrat et al, Digital badging systems as a set of cultural tools for personalized professional development, *Educational Technology Research and Development* (2021). [DOI: 10.1007/s11423-021-10028-1](https://doi.org/10.1007/s11423-021-10028-1)

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