
The Future of Work in Teaching and Digital Classroom Contexts

Laton Vermette
lvermett@sfu.ca
Simon Fraser University
Burnaby, BC, Canada

Joanna McGrenere
joanna@cs.ubc.ca
University of British Columbia
Vancouver, BC, Canada

Parmit K. Chilana
pchilana@cs.sfu.ca
Simon Fraser University
Burnaby, BC, Canada

ABSTRACT

Teaching is a profession with many demands, and the recent influx of educational technology into the classroom is requiring many teachers and instructors to adapt their methods accordingly. Although educational technology has opened the door to many classroom enrichments, it also places new burdens on teachers, who are often responsible for learning about and implementing these new tools in their classroom. We discuss some ways that educational technology is having a substantial impact on teachers' roles and workplaces, and explore how we can help to alleviate some of the challenges through novel methods for authoring and sharing software personalizations.

CCS CONCEPTS

- **Human-centered computing** → **Human computer interaction (HCI)**.

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).

The Future of Work(places) – CSCW '19, November 09–13, 2019, Austin, TX
© 2019 Copyright held by the owner/author(s).

KEYWORDS

teachers, education, software personalization

ACM Reference Format:

Laton Vermette, Joanna McGrenere, and Parmit K. Chilana. 2019. The Future of Work in Teaching and Digital Classroom Contexts. In *Proceedings of The 22nd ACM Conference on Computer-Supported Cooperative Work and Social Computing (The Future of Work(places) — CSCW '19)*. ACM, New York, NY, USA, 5 pages.

INTRODUCTION

Educational technology has grown into a multi-billion-dollar industry with massive investment from governments and industries around the world [15]. Schools are adopting new software and hardware tools at an astonishing rate, and the range of available digital tools is becoming increasingly large to match the high demand [8, 13]. Yet even with the enormous variety of digital classroom tools in use, teachers still face many challenges throughout the process of deciding what tools to use, learning how to use them, and figuring out how to personalize them to best suit their classroom needs [13].

Although it is common for teachers to perform their work in shared physical spaces, schools are an unusual type of workplace in that teachers' main work-related interactions are with their students, not their colleagues. Teachers are responsible for the well-being and educational enrichment of a class of students, as well as the spaces (both physical and virtual) that they inhabit on a daily basis. Living up to the high demands of the profession, many teachers put in large amounts of time and effort *outside of their recognized work hours* to plan their lessons, gather ideas, and prepare materials [6, 12].

Furthermore, teachers' job duties are increasingly shifting to online tasks and interactions. These may include managing and moderating student communications over classroom discussion apps like Microsoft Teams or learning management systems like Moodle, both in class and outside of school hours [10, 14]. Other tasks outside of class might involve collaborating on future activities or sharing ideas with colleagues over social media [13]. These remote duties draw upon teachers' enthusiasm for engaging their class with fun and interesting lessons, but can nonetheless contribute to common feelings of being overworked and low on spare time [6, 12].

Recent work has shown that the right design of digital classroom tools can lead to substantial improvements in teachers' classroom awareness and help them better manage their time [1, 11]. In particular, we identify some key opportunities we can help teachers with increasingly asynchronous teaching roles and teachers who perform on-demand training & tech support roles at their school. In our research, we are exploring ways to help teachers overcome some of these difficulties through (and concerning) software personalization, and especially how online communities built for *sharing* software personalizations can facilitate this.

TEACHING OUTSIDE OF SHARED PHYSICAL SPACES

Remote teaching options such as Massive Open Online Courses (MOOCs) and smaller-scale public online classes & training have become a relatively large phenomenon in recent years [2]. At the same time, many post-secondary institutions have been providing a variety of online course offerings to students alongside their usual classes. These “distance education” arrangements benefit students who would otherwise not be able to attend classes in person, and some post-secondary instructors have even begun to teach regularly through these online means, in addition to (or instead of) in-person teaching.

As a result, teaching roles have begun a gradual shift toward working outside of shared physical spaces, instead fulfilling many teaching duties behind a computer screen. Furthermore, these remote teaching duties are substantially more *asynchronous* than traditional in-person ones, as lessons and lectures can be written or recorded well in advance of students consuming them. Answering student questions similarly becomes more asynchronous in these scenarios, compared to the immediacy of in-person Q&A (such as during class or office hours). Interestingly, some teachers have found ways to fight back against this growing asynchrony, for instance by offering “online office hours” during which they commit to answering incoming student questions over email or discussion forum in real time. Other initiatives have aimed to bring a more synchronous feel to distance education through technologies like video-conferencing [7, 9] and educational intelligent agents [14].

Considering the many positive effects that immediacy and co-location with teacher and classmates can have on a student’s learning outcomes [3, 4], there are certainly many more opportunities to improve these aspects of distance education for students. However, it is just as important that we consider how these asynchronous modes of teaching may impact how *teachers* view their role in the absence of a physical classroom, and what it means for their job satisfaction and well-being when engaging only remotely with their classes.

ON-DEMAND TEACHING AND SECONDARY ROLES

Roles often considered adjacent to teaching are those of IT support and technology training in schools. However, past work has highlighted how more tech-savvy *teachers* often fulfill secondary duties as “tech support hubs” for their school [13]. These teachers take extra time out of their day to educate their colleagues on emerging technologies and how to use them effectively in the classroom, while also helping to troubleshoot technology problems for others at their school. Despite being ancillary to their more structured teaching role, the ad hoc nature of these tech support duties can be challenging for teachers to cope with on top of an already-busy work day. In particular, teachers who perform these tech support and training duties in an *unofficial* capacity (as opposed to a district-mandated

role) may feel some frustration over the degree to which it impacts their ability to fulfill their primary cause of teaching students [13].

SOFTWARE PERSONALIZATION CAN HELP

Many teachers (particularly in K-12) personalize their physical classrooms to better suit the grade level, subject, student needs, and personal preferences. Nowadays, this personalization extends to *digital* spaces as well, with teachers often having wide latitude to introduce new software applications into their digital classroom ecosystem and modify those applications' settings as they see fit. Furthermore, research has begun to explore the benefits of online communities where peer groups share and collaborate on software personalizations [5]. These personalization sharing communities are one promising way to address some of the challenges outlined above. For instance, tech support hubs who spend a great deal of time helping other teachers set up, customize, and maintain their software systems could rely on online communities to simplify the process of distributing new customizations to their colleagues, or to seek out new ideas and collaboration opportunities from broader peer groups. Furthermore, some of the budding ideas for improving the experience of teachers in asynchronous teaching environments could become much more active and widespread through such sharing communities. We are only beginning to scratch the surface how to improve teachers' ability to personalize their digital environments, but the potential benefits to both teachers and their students are vast.

CONCLUSION

There are a variety of ripe and challenging design opportunities to improve how teachers experience their many on-demand roles and how they navigate the increasing aspects of their job that take place outside of the classroom. By exploring how software personalization in online communities can help to address the asynchrony of distance education and lower the impact of on-demand tech support roles on busy teachers, we can make a positive difference in quality of work and education.

REFERENCES

- [1] Pengcheng An, Saskia Bakker, Sara Ordanovski, Ruurd Taconis, Chris L.E. Paffen, and Berry Eggen. 2019. Unobtrusively Enhancing Reflection-in-Action of Teachers Through Spatially Distributed Ambient Information. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19)*. ACM, New York, NY, USA, Article 91, 14 pages. <https://doi.org/10.1145/3290605.3300321>
- [2] Sara Isabella De Freitas, John Morgan, and David Gibson. 2015. Will MOOCs transform learning and teaching in higher education? Engagement and course retention in online learning provision. *British Journal of Educational Technology* 46, 3 (2015), 455–471.
- [3] Manuel Fahara and Armida Castro. 2015. Teaching Strategies to Promote Immediacy in Online Graduate Courses. *Open Praxis* 7 (11 2015). <https://doi.org/10.5944/openpraxis.7.4.228>

- [4] Denise Friedman and Amy Roberts. 2013. The impact of teacher immediacy on student participation: An objective cross-disciplinary examination. *International Journal of Teaching and Learning in Higher Education* 25 (01 2013), 38–46.
- [5] Mona Haraty, Joanna McGrenere, and Andrea Bunt. 2017. Online Customization Sharing Ecosystems: Components, Roles, and Motivations. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW '17)*. ACM, New York, NY, USA, 2359–2371. <https://doi.org/10.1145/2998181.2998289>
- [6] Maya El Helou, Mona Nabhani, and Rima Bahous. 2016. Teachers' views on causes leading to their burnout. *School Leadership & Management* 36, 5 (2016), 551–567. <https://doi.org/10.1080/13632434.2016.1247051> arXiv:<https://doi.org/10.1080/13632434.2016.1247051>
- [7] Olga M Klivanov, Christian Dolder, Kevin Anderson, Heather A Kehr, and J Andrew Woods. 2017. Impact of distance education via interactive videoconferencing on students' course performance and satisfaction. *Advances in physiology education* 42, 1 (2017), 21–25.
- [8] Jesse Maida. 2016. Digital Classroom Market Will Grow at an Impressive CAGR of Almost 13% until 2020, Says Technavio. <https://www.businesswire.com/news/home/20161208005416/en/Digital-Classroom-Market-Grow-Impressive-CAGR-13>
- [9] Toni Malinovski, Tatjana Vasileva-Stojanovska, Dobri Jovevski, Marina Vasileva, and Vladimir Trajkovik. 2015. Adult Students' Perceptions in Distance Education Learning Environments Based on a Videoconferencing Platform—QoE Analysis. *Journal of Information Technology Education* 14 (2015).
- [10] A. Montoya and P. Ochoa-Botache. 2018. A New Approach in Blended Teaching Combining LMS, MOOCs, and Piazza for University Courses. In *2018 Learning With MOOCs (LWMOOCs)*. 74–77. <https://doi.org/10.1109/LWMOOCs.2018.8534670>
- [11] M. Saar, L. P. Prieto, M. J. Rodríguez-Triana, and M. Kusmin. 2018. Personalized, Teacher-Driven in-Action Data Collection: Technology Design Principles. In *2018 IEEE 18th International Conference on Advanced Learning Technologies (ICALT)*. 58–62. <https://doi.org/10.1109/ICALT.2018.00020>
- [12] Kwok K. Tsang and Tsun L. Kwong. 2016. Emotional Experience of Caam2 in Teaching: Power and Interpretation of Teachers' Work. *Frontiers in Psychology* 7 (2016), 1400. <https://doi.org/10.3389/fpsyg.2016.01400>
- [13] Laton Vermette, Joanna McGrenere, Colin Birge, Adam Kelly, and Parmit K. Chilana. 2019. Freedom to Personalize My Digital Classroom: Understanding Teachers' Practices and Motivations. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19)*. ACM, New York, NY, USA, Article 318, 14 pages. <https://doi.org/10.1145/3290605.3300548>
- [14] Frančeska Xhakaj, Vincent Alevén, and Bruce M. McLaren. 2017. Effects of a Teacher Dashboard for an Intelligent Tutoring System on Teacher Knowledge, Lesson Planning, Lessons and Student Learning. In *Data Driven Approaches in Digital Education*, Élise Lavoué, Hendrik Drachler, Katrien Verbert, Julien Broisin, and Mar Pérez-Sanagustín (Eds.). Springer International Publishing, Cham, 315–329.
- [15] Yong Zhao, Kevin Pugh, Stephen Sheldon, and Joe L. Byers. 2002. Conditions for Classroom Technology Innovations. *Teachers College Record* 104, 3 (2002), 482–515.