

Technology Mediated Learning Practices in Higher Education: Exploring Innovation over Time

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פרקטיקות למידה מתווכות טכנולוגיה בהשכלה הגבוהה: החידוש ושברו

רות הלפרין

אורנים המכללה האקדמית לחינוך

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Abstract

This paper reports on a longitudinal research exploring the implementation of a Learning Management System (LMS) in higher education. A Structural Practice Lens was extended and applied to reveal the emergence and evolution of Technology Mediated Learning Practices (TML) within a Master's Programme. A case study method was used in a two phased design providing findings at distinct points in time: when the system was first introduced and after a decade of continuous operation. During the initial phase new learning practices have emerged. Over time, however, innovative practices were abandoned, reverting back to traditional pedagogy. As the LMS became institutionalized, managerial interests overruled educational agenda, leading in turn to the demise of the pedagogic innovation enabled by technology.

Keywords: learning management systems, learning technology, blended learning, higher education, structuration theory, practice lens.

Objective

The goal of this study was to explore the emergence and evolution of technology-mediated learning (TML) practices within the institutional context of higher education. The study was designed specifically to address TML in the prevalent blended mode (Garrison and Khanuka, 2004; Graham, 2013). It is concerned with the efforts of a well-established, traditional university in the UK to integrate technology into its academic learning practices. Focus was placed on the use of a Learning Management System (LMS) in the provision of a Master's program in a faculty of Social Science.

Although a growing body of literature examines the use of LMS (Hom and Fisher, 2017), findings on offer are typically anecdotal, providing snapshots of discrete experiences (Reeves and Ho, 2017). To reveal the implementation dynamics and consequences over time, the present study

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applied a longitudinal research design encompassing 16 years, with data collection and analysis undertaken in two phases. Applying a contextualist method of investigation, TML practices are not examined *per se*, and the focus is rather on the ways in which new online learning practices *interact* with and are *integrated* into, the existing and long established institutional practices. In so doing, the research seeks to offer insights into some of the substantive issues arising in blended learning.

Theoretical Framework

The study applied a Structural Practice Lens (Orlikowski, 2000, Halperin, 2017) as theoretical underpinnings. Researchers studying the adoption and use of information and communication technology have increasingly been adopting Structuration Theory (Giddens, 1984) over the last decades (Jones, 2011, Loureiro-Koechlin, and Allan, 2010; Kleser et al. 2015). Structuration is theory of the creation and reproduction of social systems based in analysis of both structure and agents as a duality: social structure is being drawn on by human agents in their actions, while the actions of humans in social contexts serve to produce, and reproduce, the social structure. Structure shapes people's practices, but it is also people's practices that constitute and reproduce structure (Jones and Karsten, 2008).

Structuration Theory provided a proper conceptual basis for this study because substantively it focuses on social practices and because it is inherently dynamic and grounded in human action (Orlikowski, 2000). The research aim was to study the role played by technology in structuring academic learning, but in contrast to the existing literature on this topic where learning is typically understood in cognitive terms, focus instead was in exploring learning as *practice* (Hager, 2014). Shifting the emphasis to the practices of groups not only coincides with prevailing approaches to learning but also echoes current moves from individual to social learning, which contemporary technologies are thought to bring about (Rendell et al., 2011). Furthermore, in the existing empirical work of learning technology emphasis tends to be placed on evaluating predefined interventions and learning outcomes (Porter et al., 2014). Informed by Structuration Theory, 'practice' was adopted as a key unit of analysis that moves away from the measurement of learning outcomes to an examination of learning activities as they unfold over time within their socio-organizational environment. Finally, as with other technological systems, the use of learning technology often leads to contradictory consequences. Structuration was therefore chosen as a non-deterministic theory (Oliver, 2011) better able to account for a wide range of dialectical processes and outcomes.

Building on earlier structural models of technology, the Practice Lens framework (Orlikowski, 2000) applied in this study is aimed at studying emergence and change in technologies and in their use. The Practice Lens starts with human action and examines how it enacts emergent structures through recurrent interaction with the technology at hand. These enacted structures of technology use are termed 'technologies-in-practice', defined as the sets of rules and resources that are (re)constituted in people's recurrent engagement with a technology (Orlikowski, 2000). Founded on Giddens's 'dimensions of the duality of structure' (Giddens, 1984), the Practice Lens model is depicted in figure 1 below.

Methodology

This research is based on a case study involving the use of a standard LMS¹ in a well-established research university in UK. It is focused on the integration of the system into the provision of a Master's Degree within a faculty of Social Science.

The case represents a typical mode of blended e-learning in which the LMS is used to facilitate delivery of courses alongside traditional face to face instruction. From its initial development in 2000, a central role has been assigned to the technology in this program, which was one of the few trial courses in which the LMS was first introduced in the institution.

The technology has continued to play a role in successive delivery of the program to this day, thereby providing an opportunity to carry out a contextualist longitudinal design (Pettigrew, 1990) as research methodology. A diverse set of data collection tools was applied, including online and offline observations, interviews, informal conversations and documentary so as to generate thick descriptions and arrive at a rich and detailed picture of the phenomenon at hand (Yin, 1984).

Data collection and analysis spanned over two phases, each encompassing three consecutive years. The first phase, from the point at which the technology was first introduced (2000-2003) and the second phase a decade later (2013-2016). Data analysis relied on an extended framework of the Structural Practice Lens (Orlikowski, 2000, Halperin, 2017). Drawing on this framework, structure of technology use, that is, TML practices were identified and accounted for.

Results

During the **first phase** of the implementation, a diverse set of TML practices has emerged. These practices were classified under three broad categories as Collaboration, Coordination and Individual Productivity practices.

The *collaboration domain* of TML consisted of practices as *information exchange* and *knowledge sharing*. Information exchange represents an emergent TML practice in which the technology was used recurrently to exchange information regarding learning content. Routine activities associated with information exchange included information seeking as well as contribution of information. The second collaboration practice was labelled *knowledge sharing* because students were seen to share information that they had organized and processed to convey understanding, experience or expertise. Knowledge sharing emerged as a major category comprising a set of novel sub-practices. For example, *knowledge presenting* characterised a sub-collaboration practice in which the technology was used recurrently to present knowledge on given learning topics in a structured and timed manner. Another TML practice termed *debate* represents a practice in which the technology was used to engage in focused debates concerning specific topic studied. Structured activities of this practice involved time-condensed message interchange in a dense 'single-topic' discussion.

To support collaboration activities within the programme, an online *coordination practice* emerged through on going use of the LMS. It involved routine activities associated with managing the learning process and relied on modules such as digital calendars and dedicated forums and conferencing.

1 WebCT followed by migration to Moodle

Self-productivity represents a TML practice where students used the learning technology to obtain various resources and content related to the course, specifically, lectures notes and reading materials uploaded by course instructors.

Findings show that during the first phase of the implementation, diverse ‘technologies-in-practice’ emerged through ongoing use of the LMS. The TML practices identified provided evidence for the emergence of new learning interactions that had not existed prior to the introduction of the technology. Since new modes of conduct did not replace their pre-existing counterparts (of the traditional learning components) but rather added to them, it was concluded that the technological environment had contributed to the enhancement of the repertoire of learning practices (Kirkwood and Price, 2014). Through these TML practices, traditional boundaries were challenged - that of time and space co-presence, and significantly, that of previous individualistic learning practice lacking any form of structured collaboration amongst students.

Furthermore, the immediate context of the offline courses, was strongly involved in structuring the technology use. Analysis of the contextual elements indicated that TML practices were intertwined with key components of the offline course, including face-to-face activities and learning tasks. TML practices were seen to provide for preparation and support, and to lend continuity to offline activities. Indeed, the contextual consequences of the technology use showed TML practices ultimately giving rise to extensions of face-to-face interactions, serving as a points of reference for offline activities and reshaping their focus and structure (Halperin, 2008).

Finding arising from the **second phase** of the analysis showed that although the LMS was continuously in use, only *self-productivity* practice persisted. The entire set of collaborative practices was abandoned as well as coordination practices which supported collaboration activities on and off-line. Over the extended period of the study, the same professor acted as program director and course convener. Other key players also kept their positions, specifically, managers within the Centre for Learning technology—a cross organizational unit responsible for learning technology support and maintenance. Although the student body changed each year, the students profile accepted to the program was mostly unchanged. Likewise, the contents and structure of the program remained. Notwithstanding this, the TML practices found in the first phase of the study did not persist or transformed but were rather abandoned. The one TML practice which was reinforced, i.e., self-productivity, is a practice associated with the individualistic tradition of the institution’s learning culture. The collaborative TML practices, representing a shift towards social constructivist pedagogy and the development of learning communities have all disappeared.

Conclusion

Moving beyond snapshots of discrete courses and experiences to observing learning technology over time within its broad institutional context, we find that the more institutionalized the technology became the less innovative were the learning practices enacted.

During its initial phase, learning technology implementation was centered on pedagogic innovation. Accordingly, key actors in the design of the technology were instructors –lecturers and their teaching teams. The LMS was meant to improve traditional teaching and learning experiences and to enhance their effectiveness. Online course development and delivery was predicated on an experimental and innovative ethos, seeking differentiation and uniqueness.

Efforts were focused on integrating technology for the purpose of increasing the quality of academic learning.

In the second phase, however, LMS use became centered on systemic streamlining. Administrators replaced instructors as key actors, providing standard conventions for course design across departments and programs. Norms dominating online course development and delivery became standardization, efficiency, minimal investment, central control and monitoring. In other word, the LMS ceased to play a pedagogic role, acting instead as a managerial tool. Indeed, blended learning became ‘the new normal’ (Halverson et al, 2017) and a compulsory component in *all* academic courses. However, the learning practices enacted reverted to old tradition now reinforced by technology.

It is argued that if technology is to realize its potential for transforming higher education (Harasim, 2000, Garrison and Khanuka, 2004) pedagogy must stand as the driving force.

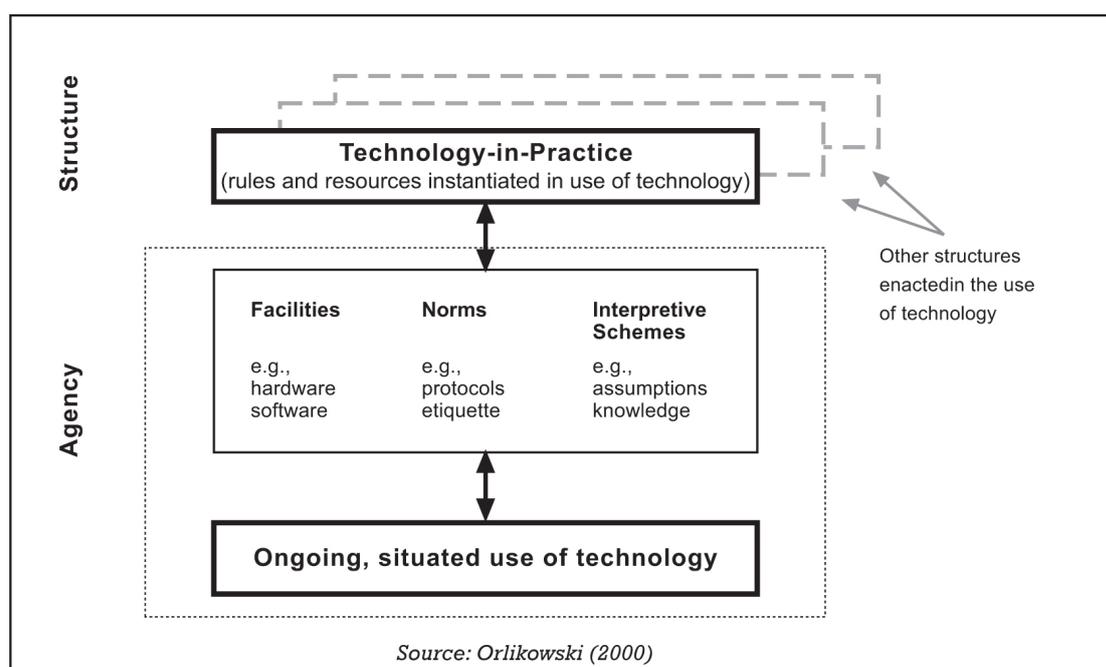


Figure 1. Enactment of technology-in-practice

References

- Garrison, D. R., & Kanuka, H. (2004). Blended Learning: Uncovering its Transformative Potential in Higher Education. *Internet and Higher Education*, 7(2), 95–105.
- Giddens, A. (1984). *The Constitution of Society*. Cambridge: Polity Press.
- Graham, C. R. (2013). Emerging practice and research in blended learning. In M. G. Moore (Ed.), *Handbook of distance education* (3rd ed., pp. 333–350). New York, NY: Routledge.
- Hager, P. (2014) Practice and Group Learning. *Educational Philosophy and Theory* 46(6) 584–599
- Halperin, R. (2017) Learning practice and technology: extending the structural Practice Lens to education technology research, *Learning Media and Technology*. 42(3), 279–294

- Halperin, R (2008) The Role of Institutional Factors in the Formation of e-learning Practices, In Editor: F. García (Ed.) *Advances in E-Learning: Experiences and Methodologies*. Idea Group, pp. 96–111.
- Halverson, L. R., Spring, K. J., Huyett, S., Henrie, C. R., & Graham, C. R. (2017). Blended learning research in higher education and k-12 settings. In J. M. Spector, B. B. Lockee, & M. D. Childress (Eds.), *Learning, design, and technology: An international compendium of theory, research, practice, and policy*. Springer International: pp. 1–30.
- Harasim, L. (2000). Shift Happens: Online Education as a New Paradigm in Learning. *Internet and Higher Education*, 3, 41–61.
- Horn, M.B., and Fisher, J.F (2017) New Faces of Blended Learning, *Educational Leadership*, 74 (6) pp. 59–63
- Jones, M. Structuration Theory (2011) in: *The Oxford Handbook of Management Information Systems - Critical Perspectives and New Directions*. W.L. Currie and R.D. Galliers (eds.), Oxford University Press, Oxford, pp. 103–135.
- Jones, M., and Karsten, H. (2008) Review: Giddens's structuration theory and information systems research. *MIS Quarterly*, 32(1) pp. 127–157
- Kirkwood, A. and Price, L. (2014) Technology-enhanced learning and teaching in higher education: what is 'enhanced' and how do we know? A critical literature review. *Learning, Media and Technology* 39
- Klesel, M, Gunnar M, and Björn N. (2015) Maturing, Flagshipping and Piggybacking: On the Use of Structuration Theory in Information Systems Research. *American Conference on Information Systems*
- Loureiro-Koechlin, C., and B. Allan. (2010) Time, Space and Structure in an e-Learning and e-Mentoring Project. *British Journal of Educational Technology* 41 (5): 721–735
- Oliver, M (2011) Technological determinism in educational technology research: some alternative ways of thinking about the relationship between learning and technology. *Journal of Computer Assisted Learning* 27 (5), 373–384
- Orlikowski, W. J. (2000). Using Technology and Constituting Structure: A Practice Lens for Studying Technology in Organizations. *Organization Science*, 11(4), 404–428.
- Pettigrew, A. (1990). Longitudinal Field Research on Change: Theory and Practice. *Organization Science*, 1(3), 267–291.
- Porter, W. W., Graham, C. R., Spring, K. A., & Welch, K. R. (2014). Blended learning in higher education: Institutional adoption and implementation. *Computers & Education*, 75, 185–195
- Reeves, TC. and Ho, EG. (2017) The goals and methods of educational technology research over a quarter century (1989–2014) *Educational Technology Research and Development* 65 (2) pp. 325–339
- Rendell, L., Fogarty, L., William J.E. Hoppitt, T.J.H., Morgan, M. M., Webster, K., Laland, N. (2011) Cognitive culture: theoretical and empirical insights into social learning strategies, *Trends in Cognitive Sciences*, 15 (2) 68–76.
- Yin, R. K. (1984). *Case Study Research: Design and Methods*. Thousand Oaks, CA: Sage.