

# Articles

## SoTEL: Toward a Scholarship of Technology Enhanced Learning

*Renate Wickens, York University*

### ABSTRACT

The publication of Ernest Boyer's innovative study, *Scholarship Reconsidered: Priorities of the Professoriate* (1990), sparked sixteen years of academic studies, high level conferences, and campus teaching reforms in a movement that has come to be known as the scholarship of teaching and learning (SoTL). During this same period, a rapidly developing study and practice of digital pedagogy, to be discussed here under the heading of Technology Enhanced Learning (TEL), generated its own extensive theoretical and practice-oriented literature. This paper is part of an ongoing work that explores points of intersection between SoTL and TEL in order to lay the groundwork for the latter as scholarship in Boyer's sense of the term, that is, SoTEL.

### RÉSUMÉ

La publication de l'étude innovatrice d'Ernest Boyer, *Scholarship Reconsidered: Priorities of the Professoriate* (1990), a démarré seize ans d'études académiques, des conférences de haute gamme, et des réformes en enseignement universitaire dans un mouvement qui est maintenant connu comme l'érudition de l'enseignement et de l'apprentissage (SoTL, ou scholarship of teaching and learning). Pendant cette même période, se développaient rapidement une étude et une pratique de pédagogie numérique, qui seront discutées ici sous le titre de l'apprentissage fondé sur une technologie améliorée (ATA), et ont généré leur propre littérature théorique et d'orientation pratique. Afin de poser les jalons pour SoTL comme érudition dans le sens du terme qu'avait Boyer, cet article fait partie d'un travail continu explorant

où SoTL et l'ATA s'entrecroisent  
et deviennent l'érudition  
d'apprentissage fondé sur une  
technologie améliorée (SoTEL, ou  
scholarship of technology enhanced  
learning)

## INTRODUCTION

Over the last 16 years, Ernest Boyer's breakthrough concept of the "scholarship of teaching," as introduced in his *Scholarship Reconsidered: Priorities of the Professoriate* (1990), has provoked a literature (Cross & Steadman, 1996; Diamond, 2002; Hutchings & Shulman, 1999; Kreber, 1999; Kreber & Cranton, 1997, 2000; Paulsen, 1999; Rice, 1992; Richlin, 1993; Weimer, 1995) that expanded the original idea into what we now understand as the scholarship of teaching and learning (SoTL). Boyer, in his capacity as president of the Carnegie Endowment for the Advancement of Learning, spearheaded this development, as did his successor, Lee S. Shulman. Their work and the work of a vast number of other scholars coincided with fundamental changes in the understanding of teaching and learning, including a shift from the transmission model of teaching to student-centred learning, an emphasis on active learning and critical thinking, a concern with diversity, and a focus on both formative and summative assessment (Pescosolido et al., 2004). SoTL's project of bridging teaching and research to create a new discipline is also relevant to the increasing emphasis on cognitive constructivism and deep learning.

This same period has also seen a rapid expansion in the use of digitally based teaching and learning technologies in what is referred to in this article as Technology Enhanced Learning (TEL).<sup>1</sup> Although TEL was implemented at all educational levels, the focus here is on its implementation and scholarly examination at post-secondary research institutions. As with SoTL, the work in TEL has generated a literature that, while discussing its own concerns, also demonstrated a cognizance of the same sweeping changes in the ideology of teaching and learning that can be related to SoTL, particularly the increased emphasis on active learning, critical thinking, and cognitive constructivism (Bates & Poole, 2003; Becker & Andrews, 2004; Biggs, 2004; Bonk & Dennen, 1999).

Certainly in many of its applications, TEL has come to illustrate, address, enable, and, in some ways, embody the larger conceptual changes of the period since 1990 and, in so doing, address issues raised in the SoTL dis-

course. From the outset, the advent of digital technologies in the classroom during this period has offered a significant parallel to the conceptual changes introduced by Perelman (1992). Digital technologies have, in the discourse of technology and education, built upon a lineage of educational technologies that have, as Perelman (1992) noted, deep roots in the history of education. However, these recent innovations are more than simply an extension or repetition of the advent of educational technologies such as film or television in the classroom because here, too, the earlier media are incorporated into digital practice. The nature of these digital technologies is, I will argue, qualitatively distinct, first, because of this ability to absorb older forms and, second, because of a set of characteristics that speak directly to the integration of teaching and research that Boyer proposed. Web-based courses and their various components may be saved, allowing teaching to be documented for the purpose of sharing it as research. In mastering the pedagogical and technical skills needed to design and use web-based courses and their components, faculty transcend the conventional distinctions between teaching and research and approximate Boyer's definition of a scholarship of teaching.

In light of these assertions it may be tempting to suggest that TEL forms a complement to contemporary educational theory in general and to SoTL in particular or, put another way, while SoTL represents a strongly focused theoretical initiative looking for manifestations in practice, TEL provides a set of practices in search of a conceptual focus. But as will be noted here, TEL, construed as either the totality of technology in learning or as the practices that have emerged since the advent of computers in the classroom (Van Meer, 2003; Woolly, 1994), is the product of a historical context that predates these trends and draws upon a literature outside of them (Bates & Poole, 2003; Saettler, 1990). In both concept and practice, TEL, to borrow Boyer's description of the relationship between what he posited as the four scholarships present in post-secondary education, "overlaps" other educational theory. Yet, at the same time, it remains distinct from the broader theory and practice of information technology (Biggs, 2003; Ulmer, 2003).

My task here is to suggest a means by which TEL may be described in the context of contemporary educational theory without being subsumed to other practices. To do so, this paper will first describe some of the issues faced in the evolution of Boyer's scholarship of teaching into what we now think of as SoTL. The purpose of this discussion is twofold: first, to illustrate the utility of Boyer's reconsidered concept of scholarship as a means of describing academic work and, second, more importantly, to highlight those aspects of SoTL that, to use Boyer's term, "overlap" with TEL. Ultimately, it will be suggested that the use of the term "scholarship of technology enhanced learning" (SoTEL), as per Boyer's original concept of scholarship,

provides a sound context for conceptualizing TEL by applying to it the criteria developed as part of Boyer's legacy.

## FROM BOYER TO SOTL

In retrospect, Boyer's (1990) *Scholarship Reconsidered* functions as a response to a long-simmering sense of malaise in American post-secondary education (Katkin, 2003). His "reconsideration" of academic roles in general and the place of teaching in particular came to be seen, according to R. Eugene Rice (2002) as "a tipping point phenomenon" that would ensconce a determination to revalue the various forms of academic work according to the experiences and ideas of faculty members themselves. In brief, *Scholarship Reconsidered* was grounded in a 1989 survey completed by 5,450 faculty members at various research and non-research post-secondary institutions across the United States. The findings of that survey documented a basic contradiction in the ideology and practice of post-secondary institutions, a disparity between what faculty value most in their work and what their institutions expect in order for those faculty members to obtain tenure and promotion. Boyer's response to this disparity was to replace the conventional research-teaching-service categories of academic work with four equally weighted and overlapping reconceptualizations of academic roles: the "scholarship of discovery," the "scholarship of integration," the "scholarship of application," and the "scholarship of teaching" (p. 16). The first of these understandings of scholarship resembles the current understanding of basic research or, in Boyer's words, "disciplined, investigative efforts" (p. 17). By the scholarship of integration, Boyer meant not only multidisciplinary and interdisciplinary work but also individual work in one field that gains through methodology taken from another. The scholarship of application is service to the university and the community that draws upon and feeds into the faculty member's area of expertise. On its part, the scholarship of teaching, in keeping with expanded definitions of the other modes of scholarship, refers not only to dissemination of knowledge in the classroom but also to the dynamic, interactive process by which "professors themselves will be pushed in creative new directions" (p. 24).

Of all Boyer's proposals, the most enthusiastically received and, simultaneously, the most contentious was the idea of a scholarship of teaching. The study cited in *Scholarship Reconsidered* found faculty members particularly frustrated by the disparity between their own high valuation of teaching and their institutions' reliance on narrowly construed, often quantitative, measures of research as a basis for tenure, promotion, and other academic rewards. Certainly, in the years since the publication of *Scholarship Reconsidered*, the scholarship of teaching has inspired a large and lively lit-

erature. Much of this literature has taken the form of studies sponsored by major foundations in the area of post-secondary education, as well as the response to those studies. In July 1995, for example, the Carnegie Foundation launched the National Commission on Educating Undergraduates in the Research University (later, the Boyer Commission) which, in its 1998 report *Reinventing Undergraduate Education: A Blueprint for America's Research Universities* (Boyer Commission, 1998), resulted in teaching reforms at more than 90 American research universities (Katkin, 2003). The Carnegie Foundation also underwrote the Carnegie Academy for the Scholarship of Teaching and Learning (CASTL), an organization that has coordinated research on more than 130 campuses. CASTL reflects the expansion of Boyer's inquiry into post-secondary teaching beyond the transmission model of education to include a new emphasis on student-centred learning, an expansion of Boyer's original concept of the scholarship of teaching to the "scholarship of teaching and learning" (SoTL). A further indication of the widespread interest in SoTL came in 2000 when the American Association for Higher Education (AAHE) attracted approximately 1,400 delegates to "*Scholarship Reconsidered* Reconsidered: Update and New Directions," a conference documenting the evolution of work done in the 10 years following Boyer's original study.

This response to Boyer was both the result of the magnitude of the issues raised and the manner in which Boyer raised them. As Rice (2002) argued, Boyer's proposals were "heuristic," more a provocation to the academic community than a detailed plan of action. Within this broadly based inquiry, the definition of scholarship spoke to a number of important conceptual and practical issues. One such strand of the inquiry took the form of articles indicating how different disciplines address the teaching/scholarship divide (Diamond & Adam, 1995; Huber, 1999; Paulsen & Feldman, 1995; Rice, 1992). It also became clear that in order for SoTL to succeed, it would have to find a means of distinguishing between excellence in teaching practice and an understanding of scholarship that contextualized that excellence within a broader understanding of pedagogical theory and practice. Incumbent in this initiative was a need to agree how the quality of such scholarship might be measured, assessed, and rewarded. In 1994, in an attempt to answer these concerns, the Carnegie Foundation contacted a combined total of 140 granting agencies, scholarly presses, and scholarly journals. Responses were analyzed, organized thematically, and subsequently published in *Scholarship Assessed* with the conclusion that, in order to be considered scholarly, work should meet six standards: clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique (Glassick, Huber, & Maeroff, 1997).

Although these criteria spoke to the nature of individual projects, Lee Shulman discerned the need to gauge SoTL against conventional understandings of the overall role of academic research. Shulman pointed to the essentially public nature of what is conventionally thought of as research: that is, work made available for peer review, critique, and re-examination by other scholars. He then noted that these characteristics are generally absent in teaching practice, which he described largely as a “private act.” His solution was to expand the understanding of teaching within the context of SoTL to incorporate a range of “elements” that include vision, design, interactions, outcomes, and analysis. It is with a consideration of these elements that the scholarship of teaching transcends the private act to reach the level of public discourse normally associated with conventional research (Shulman, 1998).

In a later article jointly authored with Pat Hutchings (Hutchings & Shulman, 1999), Shulman suggested that the scholarship of teaching implies faculty “going meta” or engaging in larger issues of learning that go beyond the limits of their own classroom practice. Scholars of teaching, regardless of their disciplines, were advised to see shortcomings in their classrooms not as practical problems (or worse, personal failures) but rather as opportunities to pursue broad-based inquiries of potential use to the entire field. The article also addressed a practical consideration raised by Shulman in his earlier piece, namely, the need to find a means of recording, disseminating, and archiving “best practices.” In fact, Shulman (1998) went so far as to state that “until we find a means of publicly displaying, examining, archiving and referencing teaching as a form of scholarship and investigation, our pedagogical knowledge and know-how will never serve us as scholars in the ways our research does” (p. 7). His response to this dilemma was the call for a recognition of new “genres” of dissemination, such as research presented in the form of course portfolios or, as is more pertinent to this study, course websites (Hutchings & Shulman, 1999).

An equally important item on Hutchings and Shulman’s agenda was “sustainability,” that is, the need to maintain a momentum of innovation within a diffuse and relatively fragile new line of inquiry. The solution these authors proposed was to redefine the work of campus research officers, making them more open to asking and evaluating the “more central questions” of teaching and learning:

If we reconceived “institutional research” to be about such questions, in the service of its faculties, led by faculty members, then the scholarship of teaching would not be some newly conceived arena of work, or a new route to tenure, but a characteristic of the institution that took learning seriously. (Hutchings & Shulman, 1999, p. 15)

In the last half decade, that work has continued, though without a final resolution to Boyer's original "heuristic" challenge to achieve a sustainable balance between research and teaching. For some, the SoTL pendulum has swung too far away from the classroom and too close to a conventional understanding of academic research in education studies. One solution to this dilemma has come not from SoTL's internal discourse but from a larger context that has posited the application of ideas as research. This trend, drawing upon the literature and experience of action research, helped shape Trigwell and Shale's (2004) response to Boyer as a call for the inclusion not just of alternate genres of research but for public engagement itself as scholarship:

Our model of a practice-based scholarship of teaching is an attempt to better describe teaching practice, taking full account of the importance of pedagogic resonance as well as pedagogic content knowledge. It is also an attempt to formulate a conception of teaching as scholarship that will help to ensure that what is developed, honored, administered and funded, and is consistent with its importance, is teaching practice rather than pedagogic research. (p. 535)

What most characterizes the legacy of Boyer's original idea of a scholarship of teaching is not just the direction of these pendulum swings between emphases on teaching practice and pedagogic research but the fact that there is a pendulum swinging (Glassick, 2000). There is little doubt that there is an entity to be recognized as the "scholarship of teaching and learning" and, if anything, the inquiry seeking to define that entity continues to expand its definitions of what constitutes SoTL. For example, recent literature has discussed both holistic (Mallard, 2002) and communal (Richlin & Cox, 2004) strategies for producing not only the scholarship of teaching and learning but the scholar formed by it. There are, as there have been almost from the outset, tangible results in the form of changes to the value that research universities assign to teaching, as well as pilot projects that both generate and evaluate new understandings of what constitutes best practices (Kreber, 2002). In the area of encouraging teaching excellence at research universities, a foundation has been laid but it is, in Katkin's (2003) analysis, "a thin foundation affecting the teaching and learning of a relatively small proportion of undergraduates and faculty" (p. 37). Building upon that foundation is what can only be described as a SoTL movement, a shared commitment to a definition of scholarship that transcends both utilitarian best practices and the constraints of conventional research in the field of educational studies.

## FROM TEL TO SoTEL

This summary of the transformation of Boyer's scholarship of teaching into the current understanding of SoTL, while far from comprehensive, is intended to provide a means of identifying points of convergence and divergence that may prove useful in discussing TEL as "scholarship" in Boyer's "reconsidered" sense of the term. Interestingly, that task has already begun within SoTL literature, particularly as it recognizes the solutions that TEL offers to the practical problems that arise in an attempt to regard teaching as research. For example, in discussing the formats for scholarship dissemination listed in the CASTL bibliography, Hutchings and Shulman (1999) placed web-based resources among many other new formats (e.g., a course portfolio, a public colloquium, a textbook) within which SoTL findings could be disseminated and, then, in a single sentence, noted: "Technology ... would seem to have special promise as a vehicle for the scholarship of teaching, but much remains to be learned about how to tap its potential" (p. 5).

If Hutchings and Shulman's evaluation of TEL was made in passing and, given the state of the art in 1999, appeared to be overly tentative, it does, again in retrospect, appear to be a step toward the recognition of TEL as integral to the SoTL discourse. Subsequent references in SoTL literature discuss ways in which technology's potential has indeed been well "tapped" and, in the process, TEL has been valued as something more than a recording instrument for the documentation of teaching. This has been particularly true in what has become a central concern of SoTL, that is, the integration of teaching and learning as scholarship in designated research universities (Becker & Andrews, 2004; Kreber, 2002). Shulman (2004) proposed the model of a "teaching academy organized around technology" as one of four such models through which SoTL may be pursued at research universities.<sup>2</sup> In describing this model, Shulman identified the consideration of TEL as an element to be integrated amid teaching and learning, as an essential part of the evolution of SoTL. He wrote:

Adding technology as the third component and creating teaching academies at the intersection of teaching, learning and technology may be just the right strategy at this point in time. I see lots of evidence that technology in this next decade may turn out to be the hardest-hitting and fastest-developing context for the creation and work of teaching academies. (p. 16)

What Shulman advocated here is seeing technology as more than simply a means for solving the problem of recording the private practice of teaching so as to make it accessible to the public world of research. Rather, he appeared to recognize technology used in the academy as having attributes that make it, in and of itself, a fundamental part of the inquiry. This is in

keeping with a theory of technological development with a long history in the field of media studies. Certainly Marshall McLuhan (1964) argued that the content of media is first seen in terms of older media until, over time, distinctly indigenous practices and formats within the new medium evolve and are recognized. For example, "moving pictures" was, in the early 20<sup>th</sup> century, a term that identified the new medium of cinema as a format for presenting photography, just as photography had been originally received as a kind of mechanical painting. The same may also be said of this "paper" which, until its various electronic manifestations are actually printed, will have very little to do with paper. McLuhan labelled this phenomenon the "rearview mirror" and suggested that any comprehension of a new medium could only be achieved after one compensated for it.

In regard to pedagogical technologies, searching for what this new comprehension may entail is the overriding task of those actively engaged in TEL or, what we might now call, evoking Boyer's scholarships, a scholarship of technology enhanced learning (SoTEL). This entails a transition from the rearview-mirror view of teaching technologies to seeing the new medium as it takes place in daily practice as well as in the literature of the field. Those of us who create and teach with web-based courses know that they are not simply the "moving pictures" of conventional courses but rather open-ended entities taking advantage of the current state of interactivity and connectivity of digital media. Within that course, a lecture is no longer one voice talking during a designated time slot but rather a recording of ideas that may interact in any number of ways, and at any time the student chooses, with links to reference materials, including other lectures. In the same way, a tutorial is not limited to a specific time and place but functions as an ongoing hermeneutic conversation, singularly with the tutorial leader or collectively with any subset of the class or, in some instances, other classes.

Another aspect of a medium coming into its own is its creation of unique forms. One obvious example in TEL is the learning object as defined and debated in a growing body of literature (Bannan-Ritland, Dabbagh, & Murphy, 2000; Gibbons, Nelson, & Richards, 2000; Wiley, 2000). The common denominator of this discussion is that the learning object is not just a resource that happens to be modular but also the essentially modular nature of digital media (Manovich, 2001) that makes the learning object viable.

Focusing on what is unconventional and medium-specific about digital teaching/learning technologies is nowhere more visible than in those aspects of SoTL that TEL may be seen as addressing. Tapping TEL's potential as a genre by which, according to Shulman's (1998) criteria, pedagogical scholarship could be displayed, examined, archived, and referenced is the most obvious example. At its most fundamental level of practice, TEL provides a "vehicle" enabling "public" documentation of the "private act" of teaching.

In fact, it even provides a flexible notion of “public” and “private,” given that access to teaching sites can be precisely determined through password protocols. Sites for fully online and, in many cases, hybrid courses provide, within the sites themselves, evidence of what *Scholarship Assessed* saw as the criteria for research: clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique (Glassick, Huber, & Maeroff, 1997). It might also be suggested that, taken together, these sites provide a historical overview of the implementation of digital learning technologies, a record not only of their increasing sophistication but also, if read in context, the response of TEL practitioners to critiques of their practice.

It should be emphasized though that TEL must be regarded as more than a recording device for best practices in digital pedagogy. In much the same way that Boyer fought the idea of scholarship as limited to conventional forms of presentation, web-based teaching sites are not only successful in providing evidence of research but they also test the criteria for research. TEL practice suggests, for instance, that the “public” reached is not limited to peer researchers. It may be said that a web-based teaching site is “researched” by students in the course as they take advantage of the learning materials created for the course and the links to learning materials outside it. The teaching site can also be researched by colleagues designing their own sites, students from other courses directed to it, and assessors evaluating the curriculum. As Jones and Harmon (2002) pointed out, the same software used for assessing the student may also be applied to assessing the course. It may do so in a highly quantitative way (counting the “hits” on various links within the site) or by a variety of qualitative tools (archived records of educational pod casts, blogs, tutorials, chat rooms, or email correspondence).

A teaching site’s design is also dynamic, testing the boundaries of what is conventionally regarded as a fixed piece of research. The dynamism of a web-based course takes at least two forms. First, the course can be (and usually is) continually adjusted as the course progresses and, as a result, there is no definitive version. Second, this dynamism continues even after the course is completed; the site, the modules within it, or its design strategy may be recycled into other courses. In sum, a web-based learning course is a process in which teaching and research are indivisible—quite possibly in the same sense that they are meant to be seen as indivisible in the SoTL discourse.

In its reflection and analysis of the teaching process, another one of SoTL’s core issues is the attempt to differentiate between the pursuit of excellence in teaching and the engagement in a fuller scholarship of teaching and learning. TEL practice may be seen to aid in establishing this distinction through the examination of the use of web-based teaching sites. Ostensibly, the professor wishing to pursue excellence in teaching produces utilitarian sites aimed at the specifics of course delivery or, put another way, the content of

specific sites. In contrast, the scholar of teaching and learning might be seen as demonstrating a broader interest in teaching technologies as a whole, or in their form. In practice, the form/content distinction is no more useful to TEL than it was to the many creative practices and theoretical inquiries that have long since discarded that distinction. Even within the parameters of off-the-shelf teaching platforms such as WebCT and Blackboard, it is impossible to simply “fill in the blanks.” The experience of designing and offering online courses encourages a more sophisticated awareness of how interactivity and interconnectivity, as constructed by digital technologies, will invariably shape the teaching/learning context. And, like the distinction between research and teaching, the distinction between user and developer is continually challenged by digital learning technologies, the extent to which an application may be modified by its user, in many instances, being touted as one of its chief virtues.

Digital technologies also provide an opportunity to define TEL as an academic pursuit. Portal sites provide cross-referenced links to online publications, conference materials, course materials, and multimedia presentations. These sites have been prepared by individuals (Curtis Bonk’s “Castle of Learning” website),<sup>3</sup> as discipline-based initiatives (the American Studies Association’s “Crossroads” project),<sup>4</sup> and by the resources of professional organizations (the “Ed/IT Lib” collection made available online by the Association for the Advancement of Computing in Education).<sup>5</sup> There is also a growing movement toward the creation of academic “superarchives,” such as the “Open Archives Initiative,”<sup>6</sup> which contains vast stores of published and unpublished materials and supports both text and multimedia (sound, images, moving images) documentation donated by individual academics (Lagoze & Van de Sompel, 2003).

Although these aspects of research are made possible by purely quantitative factors such as continuing improvements in storage capacity and retrieval speed, these quantitative changes have deep qualitative implications. The speed at which disparate material may be accessed from this constantly expanding archive makes it possible to associate different work in new varieties of ways, creating instant specialized inquiries. Web access widens the scope of individual papers and, certainly in the case of TEL, facilitates the formation of an inherently interdisciplinary field (McCracken & Dobson, 2003). Case studies may be searched according to discipline or according to the concept underlying them, while theoretical concepts regarding TEL may be accessed via links to the literature of any number of fields. As this pervasive interdisciplinary mode of research comes to be taken for granted (even describing it feels like an exercise in the obvious), research per se is increasingly defined as a practice beyond disciplinary constraints.

In these examples, it is possible to demonstrate some ways in which a consideration of TEL's ostensibly practical aspects in regard to SoTL lead to a recognition of TEL embodying more conceptual concerns. TEL also speaks to the concepts underlying SoTL. It is, for example, the sense in which Hutchings and Shulman (1999) used the term, as a model of a "sustainable" initiative. The investment in and presence of the hardware and software now dedicated to teaching (not to mention the resources spent on operating, maintaining, and training) has had an immeasurable effect in encouraging university administrators and faculty to contend with TEL's potential. The presence of digital technology applicable to post-secondary learning is quite literally on everyone's desk and is likely to stay there, increasing its capacity in order to accommodate an increasing number of functions.

From the beginning, TEL has also functioned as a joint enterprise with students, whose adoption of computing skills and acquisition of computing resources has constructed TEL as a partnership between teachers and learners. Students expect access to web-based learning resources that include not only web-based courses but also what are now seen as basic learning eResources, such as an online library catalogue, email access to faculty, and training sessions in new applications. These resources constitute one of the driving forces behind TEL's sustainability. The weighty changes in teaching and research practice that have already been brought about by digital technologies are not likely to be reversed, particularly as digital technologies have an ever-greater impact in so many other facets of life. The same may be said of the teacher/learner partnership facilitated by digital technology. Even those faculty members who are not actively involved in teaching online will see an increasing TEL presence in student work. Access to web-based resources, for example, has raised expectations for the depth of research in student assignments and the creativity of their presentations.

An engagement with learning technologies also entails taking, consciously or not, a stance in current educational discourses around issues such as constructivist learning, deep learning, and action research. What that stance might be is, increasingly, a matter of contention. The characteristics of web-based teaching and learning described (in small part) above has most often been described as generating a symbiotic relationship with constructivist theories and practices (Bonk & Cummings, 1998; Duffy, 1996; Jonassen, Peck, & Wilson, 1999). This interrelationship continues to evolve. For example, Patrick Dillon (2004) noted, "New conceptions of constructivism have been proposed that are more in keeping with both technological developments and current thinking about the nature of learning" (p. 146). Dillon's ecological context for what he sees as "a mixed economy of information transmission and action-theoretical forms of constructivism" (p. 148) frames the interface of contemporary constructivism and TEL within a heritage of learning

theory, with its roots in Deweyism, and points forward to the continued productivity of that interaction.

Other academic commentators are less certain that TEL's ideological stance is inherent to or even compatible with a constructivist approach to teaching. Marxist writers (e.g., Noble, 2002) see TEL as quite the opposite of a student-centred, open-ended, active learning practice. For them, the advent of digitally based teaching and learning is little more than a corporate conspiracy to denigrate the work and inhibit the intellectual freedom of both teachers and learners. Perelman's (1992) objections to digital teaching technologies are reflective of a more broadly based perception that the wholesale adoption of digital learning technologies has deflected attention from fundamental practices and needs in education as a whole.

These rejections of TEL in some ways parallel the unease on the part of those who regarded SoTL as an intrusion upon or degrading of traditional research parameters. However, although they may well serve as cautionary interventions, it is also worth noting that, in addition to these overly optimistic and pessimistic views of TEL's place in teaching and learning, there is central ground. Maureen Spencer (2004), for example, viewed TEL as a site not only of contention but also of possible synthesis between conventional values of liberal education and a postmodern *Weltanschauung* more compatible with cognitive constructivism. She noted that "a reinvigorated assertion of rationality, critical inquiry and individual human worth alongside the postmodernist more sustained subversive questioning of authority, power and certainty may be more fruitful" (no pagination).

It is perhaps this last aspect of TEL as a provocation for a revaluing of approaches to post-secondary education that most closely aligns it with long-term SoTL inquiry. Both SoTL and TEL have, in the course of their development, addressed deep-rooted and seemingly insoluble issues in post-secondary education. SoTL proposed a way around the moribund hierarchy of research, teaching, and service, and TEL spoke to the issue of how educators might cope with the overwhelming increases in scholarly output, the challenges to disciplinary boundaries, and the reinvention of communication through electronic media. Both inquiries have engaged large numbers of scholars in an ongoing exchange of practices and ideas. And perhaps most importantly, like SoTL, TEL's place in the university still hangs between a conventional valuing of teaching practices (e.g., teaching as face-to-face transmission and TEL as audio/visual "aids") and the challenge not only of deep learning but also of a deep rethinking of the research university as posited by Boyer.

## CONCLUSION

Having discussed areas of convergence between SoTL and TEL, the question remains as to whether TEL is best served by, as Shulman proposed, integrating it into SoTL (producing, presumably, a scholarship of teaching, learning, and technology) or by positing it as a fifth such “scholarship” as per Boyer, that is, the scholarship of technology enhanced learning (SoTEL). The question is of some importance as universities continue to test Boyer’s reconceptualization of their functions against new potentials and less-positive realities (cutbacks, simplistic standards of accountability, an increased demand to provide applied research to the private sector, culture wars, and other ideological pressures). Within the present and future university context, would TEL function better under the umbrella of an inquiry into teaching and learning? Or do those who engage with the practices and ideas around learning technologies have an obligation to pursue an independent scholarship that, like the technology itself, is intrinsically linked to a world outside of pedagogy? In other words, should the scholarship of this pervasive practice value an open-ended connectivity any less than the machines with which it works?

My own argument is that while TEL has and will continue to have a productive interaction with Boyer’s legacy, its pursuit as a distinct scholarship transcends this work. Only part of the scholarship of technology enhanced learning is concerned with an understanding of learning; its other equally important focus, as seen in the body of this article, is with the relationship between learning technologies and technology itself. Shulman’s proposal, generous and enthusiastic as it might seem, nevertheless orients a study of TEL in only one of these directions. “Scholarship,” as Boyer defined it, requires a more exhaustive pursuit of the subject matter.

This will not always be easy for SoTEL, as may be seen, for example, in discussions of TEL’s historical context or, as it seems, two historical contexts. The first of these takes in all of history with the argument that many communications technologies from the beginning of human history had educational applications and therefore education and technology are inseparable phenomena (Bates & Poole, 2003; Saettler, 1990). The implication for SoTEL would be a need to consider the entirety of this long history, welcoming not only case studies on the impact of pre-digital technologies on pedagogy but also concerning itself with the wide range of historical, anthropological, cultural, and communications theories that examine such interactions.

SoTEL’s second historical context begins with the advent of digital technologies, which, while recognizing experiments going back to at least the University of Illinois’s PLATO project in 1958, is essentially oriented to the here and now. This is perhaps more in keeping with Boyer’s and Shulman’s understandings of scholarship as an activist pursuit that privileges current

practice. For example, Shulman's (2000) interpretation of Boyer is grounded in what he refers to as the three "p's" of ongoing work: professionalism, pragmatism, and policy. From a more theoretical perspective, SoTEL must at least contend with the assertion that digital technology is qualitatively distinct from previous technologies precisely because it provides the means to incorporate not only all the media that have come before it but also all the processes of media production and distribution (Manovich, 2001).

Unlike SoTL, the scholarship of technology enhanced learning emanates from no one "tipping point" and certainly does not originate from a single study as robust as Boyer's *Scholarship Reconsidered*.<sup>7</sup> Moreover, if such a text existed, it would be just as likely to be part of the literature of technology or media studies as education. But what is perhaps more important to SoTEL than a founding text in either of these areas is a literature that attempts to locate TEL in relation to the larger world of information technology (IT) or information communications technology (ICT). For example, Ron Owston (1997) questioned expectations of the web as an effective and viable learning tool, while John Biggs (2003) argued for the necessity of a distinction between IT and what he refers to as Educational Technology (ET), seeing the unstructured use of IT as detrimental to an essential learning relationship:

It is important to get away from the notion that the use of technology is about presenting more and more information. The word "information" before "technology" may easily imply that. Efficient information-handling is certainly most useful and convenient in managing learning and administering programs, but in teaching itself, we should not limit ourselves just to the information-handling facility of electronic technology. (p. 214)

Somewhat ironically, even this literature is bifurcated between Owston's and Biggs's education-based writings and a school of thought more clearly based in technology and media studies. Gregory L. Ulmer (2003), for example, suggested that the process of adapting technology to learning is flawed. Instead of reorienting technology toward the needs of education, he advocated reorienting education to the deeper understanding of technology. The goal is what Ulmer referred to as "electracy," a literacy pertaining to digital apparatus.

Given its growing variety of practices and its vast potential thanks to the ever-increasing memory, speed, and connectivity of digital tools, as well as the ubiquitous digital sphere in which so much human activity takes place, it is not likely that any single discipline-oriented discourse will be sufficient to encompass SoTEL. We must be open to discussion of technology, learning, and education in the broadest senses of those terms. This paper has taken a first step in pointing to a set of practices and understandings of those prac-

tices that parallel in their complexity and influence Boyer's conceptual innovation and thus may be seen as an analogous call for a new discourse. The next step in that discourse might well be a plan for integrating educational ideas and experience from across the digital sphere, with the object of finding foci for further interdisciplinary study. However, we should not expect the evolution of SoTEL to unfold in the relatively linear fashion that marked the development of Boyer's original idea. Like the teaching materials it studies, SoTEL will take place as an open-ended idea exchange, engaging participants from both sides of an increasingly blurry teaching/learning divide. Not all questions will or can be resolved to everyone's satisfaction. But then SoTEL, like any other form of scholarship, is ultimately defined not only by the ability to resolve questions inherent to its subject matter but also, in the best hermeneutic sense, by the ability to ask them.

## ENDNOTES

1. Technology Enhanced Learning is, of course, one of a number of terms (e.g., e-learning technologies, web-based instruction) used to describe the advent of digital technologies in pedagogical theory and practice. I have chosen to use it here because it is one of the more enduring and commonly used such terms, with self-labelled TEL initiatives currently underway not only across North America (e.g., Ohio State University, University of Texas at Austin, Harvard Business School) but also in the European Union (as part of the EU's Cordis Program <http://www.cordis.lu/ist/telearn/index.html>) and Southern Africa (The Telisa Initiative <http://pgw.org/telisa/>). I might also note that it is the terminology used at my home institution, York University (Toronto), where I serve as the Technology Enhanced Learning appointment in the Faculty of Fine Arts and Fine Arts Cultural Studies.
2. The other three models focus on interdisciplinarity, graduate studies, and a distributed model serving single instances of SoTL in many different units.
3. Retrieved August 10, 2005, from <http://php.indiana.edu/~cjbonk>.
4. Retrieved September 7, 2005, from <http://www.georgetown.edu/crossroads/conversations>.
5. Retrieved September 7, 2005, from <http://www.editlib.org>.
6. Retrieved September 7, 2005, from <http://www.openarchives.org>.
7. Though if a case were to be made for such a "tipping point," the most convincing candidate might well be the PLATO project. PLATO (Programmed Logic for Automatic Teaching Operation) began by making computer terminals available to students at a number of Illinois

campuses but soon developed into a wide-ranging experimental program that, working well into the 1980s, pioneered a wide range of educational hardware and software including early web-based teaching initiatives (Woolley, 1994). PLATO also generated a literature not only about its technical innovations and pedagogical implementation but also about the place of computers in education.

## REFERENCES

- Bannan-Ritland, B., Dabbagh, N., & Murphy, K. (2000). *Learning object systems as constructivist learning environments: Related assumptions, theories and applications*. Retrieved January 21, 2007 from <http://reusability.org/read/chapters/bannan-ritland.doc>.
- Bates, A. W., & Poole, G. (2003). *Effective teaching with technology in higher education: Foundations for success*. San Francisco: Jossey-Bass.
- Becker, W. E., & Andrews, M. L. (Eds.). (2004). *The scholarship of teaching and learning in higher education: Contributions of research universities*. Bloomington: University of Indiana Press.
- Biggs, J. (2003). *Teaching for quality learning at university*. New York: Open University Press.
- Bonk, C.J. & Cummings, J.A. (1998). *A dozen recommendations for placing the student at the center of web-based instruction*. *Educational Media International* 35(2), 82-89.
- Bonk, C. J., & Dennen, V. (1999). Teaching on the web: With a little help from my pedagogical friends. *Journal of Computing in Higher Education*, 11(1), 3–28.
- Boyer, E. (1990). *Scholarship reconsidered: Priorities of the professoriate*. Princeton, NJ: The Carnegie Foundation for the Advancement of Teaching.
- Boyer Commission on Educating Undergraduates in the University. (1998). *Reinventing undergraduate education: A blueprint for America's research universities*. Stony Brook, NY: State University of New York at Stony Brook.
- Cross, K. P., & Steadman, M. H. (1996). *Classroom research: Implementing the scholarship of teaching*. San Francisco: Jossey-Bass.
- Diamond, R. M. (2002). Defining scholarship for the twenty-first century. *New Directions for Teaching and Learning*, 90(Summer), 73–80.
- Diamond, R. M., & Adam, B. E. (Eds.). (1995). *The disciplines speak: Rewarding the scholarly, professional and creative work of faculty*. Washington, DC: American Association for the Study of Higher Education.

- Dillon, P. & Cunningham, D. J. (2004). Trajectories and tensions in the theory of information and communication technology in education. *British Journal of Educational Studies*, 52(2), 138–150.
- Duffy, T. M. (1996). Constructivism: Implications for the design and delivery of instruction. In D. H. Jonassen (Ed.), *Educational Communications and Technology* (pp. 170-198). New York: Simon & Shuster.
- Gibbons, A. S., Nelson, J., & Richards, R. (2000). The nature and origin of instructional objects. In D. A. Wiley (Ed.), *The instructional use of learning objects*. Retrieved January 21, 2007, from <http://reusability.org/read/chapters/gibbons.doc>.
- Glassick, C. (2000). Boyer's expanded definitions of scholarship, the standard for assessing scholarship, and the elusiveness of the scholarship of teaching. *Academic Medicine*, 75(9), 877–880.
- Glassick, C.E., Huber, M.T. & Maeroff, G.I. (1997). *Scholarship assessed: evaluation of the professoriate*. San Francisco: Jossey-Bass.
- Huber, M. T. (1999). Developing discourse communities around the scholarship of teaching. *Carnegie Chronicle-Supplemental Material. National Teaching and Learning Forum*, 8(6). Retrieved September 2, 2005, from <http://ntlf.com/html/lib/carnegie/86huber.htm>.
- Hutchings, P., & Shulman, L. S. (1999). The scholarship of teaching. *Change*, 31(5), 10–15.
- Jonassen, D. H., Peck, K. L., & Wilson, B. G. (1999). *Learning with technology: A constructivist perspective*. Upper Saddle River, NJ: Merrill, Prentice Hall.
- Jones, M. G., & Harmon, S. W. (2002). What professors need to know about technology to assess on-line student learning. *New Directions for Teaching and Learning*, 91(Fall), 19–30.
- Katkin, W. (2003). The Boyer Commission and its impact on undergraduate education. *New Directions for Teaching and Learning*, 93(Spring), 19–38.
- Kreber, C. (2002). Controversy and consensus on the scholarship of teaching. *Studies in Higher Education*, 27(2), 151–167.
- Kreber, C. (1999). A course-based approach to the development of teaching-scholarship: A case study. *Teaching in Higher Education*, 4, 309–325.
- Kreber, C., & Cranton, P. A. (2000). Exploring the scholarship of teaching. *Journal of Higher Education*, 71, 476–495.
- Kreber, C., & Cranton, P. A. (1997). Teaching as scholarship: A model for instructional development. *Issues and Inquiry in College Learning and Teaching*, 19(2), 4–13.

- Lagoze, C., & Van de Sompel, H. (2003). *The Open Archives Initiative: Building a low-barrier interoperability framework*. Retrieved August 28, 2005, from <http://www.openarchives.org/documents/jcdl2001-oai.pdf>.
- Mallard, K. S. (2002). The soul of scholarship. *New Directions for Teaching and Learning*, 90(Summer), 59–69.
- Manovich, L. (2001). *The language of new media*. Cambridge, MA: MIT Press.
- McCracken, J., & Dobson, M. (2003). *Uncovering principles for blended learning design*. Unpublished manuscript, Simon Fraser University, Vancouver, British Columbia.
- McLuhan, M. (1964). *Understanding media: The extensions of man*. New York: New American Library.
- Nobel, D. F. (2002). *Digital diploma mills: The automation of higher education*. Toronto: Between the Lines Press.
- Owston, R. D. (1997). The World Wide Web: A technology to enhance teaching and learning? *Educational Researcher*, 26(2), 27–33.
- Paulsen, M. B. (1999). How college students learn: Linking traditional educational research and contextual classroom research. *Journal of Staff, Program, and Organizational Development*, 16(2), 63–71.
- Paulsen, M. B., & Feldman, K. A. (1995). Toward a reconceptualization of scholarship: A human action system with functional imperatives. *Journal of Higher Education*, 66, 615–640.
- Perelman, I. J. (1992). *School's out: The new technology and the end of education*. New York: Avon Books.
- Pescosolido, B. A., Loftus, J., Scherr, S., Fingerson, S., Hadley, K. G., Stuber, J., & Namaste, P. R. (2004). The three faces of SOTL: The contribution of the summer Freshman Institute Project to service, teaching and research. In W. E. Becker & M. L. Andrews (Eds.), *The scholarship of teaching and learning in higher education: Contributions of research universities* (pp. 143–160). Bloomington: University of Indiana Press.
- Rice, R. E. (2002). Beyond *Scholarship Reconsidered*: Toward an enlarged vision of the scholarly work of faculty members. In K. J. Zahorski (Ed.), *Scholarship in the postmodern era: New venues, new values, new visions* (pp. 7–18). San Francisco: Jossey-Bass.
- Rice, R. E. (1992). Toward a broader conception of scholarship: The American context. In T. G. Whiston & R. L. Geiger (Eds.), *Research and education in the United Kingdom and the United States* (pp. 117–129). Lancaster, UK: Society for Research Into Higher Education.

- Richlin, L. (1993). Openness to a broader view of scholarship. In L. Richlin (Ed.), *Preparing faculty for new conceptions of scholarship* (pp. 39–46). San Francisco: Jossey-Bass.
- Richlin, L., & Cox, M. D. (2004). Developing the scholarship of teaching and learning through faculty learning communities. *New Directions in Teaching and Learning*, 97(Spring), 127–135.
- Saettler, P. (1990). *The evolution of American educational technology*. Englewood, CO: Libraries Unlimited.
- Shulman, L. S. (2004). Visions of the possible: Models of campus support for the scholarship of teaching and learning. In W. E. Becker & M. L. Andrews (Eds.), *The scholarship of teaching and learning in higher education: Contributions of research universities* (pp. 9–23). Bloomington: University of Indiana Press.
- Shulman, L. S. (2000). From Minsk to Pinsk: Why a scholarship of teaching and learning? *The Journal of the Scholarship of Teaching and Learning*, 1(1), 48–52. Retrieved August 30, 2005, from [http://www.iupui.edu/~josotl/VOL\\_1/NO\\_1/shulman\\_vol\\_1\\_no\\_1.htm](http://www.iupui.edu/~josotl/VOL_1/NO_1/shulman_vol_1_no_1.htm).
- Shulman, L. S. (1998). Course anatomy: The dissection and analysis of knowledge through teaching. In P. Hutchings (Ed.), *The course portfolio: How faculty can examine their teaching to advance practice and improve student learning* (pp. 5–12). Washington, DC: American Association for Higher Education.
- Spencer, M. (2004). E-learning and ideology—A post modern paradigm or liberal education reborn? *Web Journal of Current Legal Issues*, 4. Retrieved September 6, 2005, from [http://webjcli.ncl.ac.uk/2004/issue4/spencer4.html#\\_ftn4](http://webjcli.ncl.ac.uk/2004/issue4/spencer4.html#_ftn4).
- Trigwell, K., & Shale, S. (2004). Student learning and the scholarship of university teaching. *Studies in Higher Education*, 29(4), 523–536.
- Ulmer, G. L. (2003). The internet and its double. In G. Liestøl, A. Morrison, & T. Rasmussen (Eds.), *Digital media revisited: Theoretical and conceptual innovations in digital domains* (pp. 91–114). Cambridge, MA: MIT Press.
- Van Meer, E. (2003). PLATO: From computer-based education to corporate social responsibility. *Iterations: An Interdisciplinary Journal of Software History* (5 November). Retrieved September 5, 2005, from <http://www.cbi.umn.edu/iterations/vanmeer.html>.
- Weimer, M. (1995). Why scholarship is the bedrock of good teaching. In R. J. Menges & M. Weimer (Eds.), *Teaching on solid ground: Using scholarship to improve practice* (pp. 1–20). San Francisco: Jossey-Bass.

- Wierschem, D., McMillen, J., & McBroom, R. (2003). What academics can gain from building a data warehouse. *Educause Quarterly*, 1, 41–46.
- Wiley, D. A. (2000). Connecting learning objects to instructional design theory: A definition, metaphor and taxonomy. In D. A. Wiley (Ed.), *The instructional use of learning objects*. Retrieved January 21, 2007, from <http://reusability.org/read/chapters/wiley.doc>.
- Woolley, D. R. (1994). *PLATO: The emergence of online community*. Retrieved September 5, 2005, from <http://www.thinkofit.com/plato/dwplato.htm#origdev>.

## BIOGRAPHY

Renate Wickens is an associate professor of fine arts and cultural studies and the Technology Enhanced Learning (TEL) appointment in the Faculty of Fine Arts at York University. In addition to her work on the conceptualization of online pedagogy, she has published in the area of cultural studies with a particular interest in still and moving images.

Renate Wickens est professeur agrégé études culturelles des beaux-arts et occupe le poste en Technology Enhanced Learning (TEL) de la Faculté des Beaux-arts de l'Université de York. En plus de son travail sur la conceptualisation de la pédagogie en ligne, elle a publié dans le domaine des études culturelles portant un intérêt particulier aux images fixes et les images en mouvement.