PREPARING FOR SUPERVISION

DEVELOPING AN ONLINE COLLABORATION PLATFORM FOR TEACHING AND LEARNING RESEARCH METHODOLOGY

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INTRODUCTION

Postgraduate studies can be lonely and daunting for learners while also being a repetitive exercise for supervisors. Research methodology is taught as a compulsory module for many postgraduate qualifications within higher education institutions (HEIs). As a result, HEIs have numerous academics that teach research methodology modules. Furthermore, the academic content is taught multiple times to students within different degree programmes thereby duplicating effort and knowledge. From an institutional knowledge and information management perspective it would be useful to find a way in which universities could make better use of this knowledge in a manner that is economically viable for the institution while still providing a quality learning experience to the learners within their various disciplines. Duplication of crosscutting principles in the teaching of research methodology is both undesirable and uneconomical, seeing that it requires repetitive input (Stubbs & Range 2011:299). However, there remain portions of the teaching of research methodology that is specific to each discipline.

One option to address this repetitive input is by using a joint approach (Anderson & Backhouse 2009) between pedagogy and technology (Stubbs & Range 2011:299). It is possible to use technology to ensure an enhanced personal eLearning environment (Wilson *et al* 2007). Chawla and Jindia (2011:68) indicate that students have different attitudes to eLearning directly related to their technical abilities, thus their attitude is directly correlated to their experience with computers and the time that they are willing to spend using them.

Education at HEIs is a sought-after product of both an intangible and a concrete nature. On a concrete level HEIs confer qualifications on graduates, while

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the intangible attraction is encapsulated in the experiences, relationships and development of soft skills such as critical thinking, analytical thinking and the ability to conceptualise. Defining the product and creating meaningful relationships with both staff and students is crucial to providing a successful product (Cummings 2006). There is also competition within institutions with respect to funding, gathering sufficient student numbers, infrastructure utilisation and budgets which all contribute to a strain on resources. Therefore collaboration between disciplines, departments, faculties or institutions could translate into sharing scarce and stretched resources, eliminating duplication. There is a real need for students to learn how to create knowledge, which involves collaboration, consultation, teamwork and connectivity. Considering the major theories in student development (Evans, Forney, Guido, Patton & Renn 2010:9-17), one of the important lessons students learn during their experience at university is social and intellectual maturity, which is often developed within collaborative learning communities rather than through the consumption of content. The ability to create knowledge develops during the postgraduate student's journey towards becoming a researcher. The collaboration, consultation, teamwork and connectivity of the budding researcher, the subject(s) or object(s) of research, the supervisor and peers constitute a collaborative learning community in itself. These communities are often face-to-face or a combination of face-to-face and online, and awareness of collaborative learning communities is growing on the Web (Rae, Taylor & Roberts 2006:227). Active consumers of and contributors to online communities operate both as 'users' and 'producers' of online content. As a result, Bruns (2007) coined the term 'produser', to imply a user that also produces content through the process of online collaboration.

There is thus a need to explore possibilities to address the design of learning support that can facilitate the collaborative, consultative and teamwork approach to allow students to develop their produsage skills. Considering varying student profiles, the research focused on the architectural design concepts which need to be addressed in implementing an online collaboration-driven community for teaching research methodology at postgraduate level.

In this chapter the literature reviewed reflects learning management systems and collaboration portals. We then report on the research conducted towards the design and evaluation of the first prototype for the online collaborative platform and the resultant conceptualisation of the collaboration platform and knowledge repository.

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LEARNING MANAGEMENT SYSTEMS AND COLLABORATION PORTALS

Web collaboration allows users to create, share and contribute to communications and published content, without the need for knowledge of the underlying infrastructure (Scale 2009:11). However, within HEIs there may be resistance to acceptance of technology by academic staff. A further hindrance is the rapid pace of technological innovation in terms of content expansion, rate of expansion and accumulation of human knowledge (Craig 2007:153; Allard 2009). This continuous change has implications for academic staff and students. The unprecedented rate of this expansion has serious implication for users that requires continuous reskilling. Reskilling includes the development of greater judgment of what constitutes authoritative content, the art of negotiating Web 2.0 technologies, but more importantly they need a sensitisation to take accountability for delivering authentic, authoritative and valuable content. The fact that content is being created and processed outside the traditional cycle of publisher, editing and peer review processes has implications for copyright and intellectual property rights. Allard (2009) points out that cyber infrastructure is implicit. It is implied that the produser would have the technology to support their current information seeking and provider practices, but also that they would have the capacity to grow and interact with the growing cyber infrastructural needs and offerings. While scepticism of the value of technology remains a challenge (Craig 2007:153) it is imperative to assess institutional readiness for technological acceptance.

It seems that in the global environment it is a given reality for higher education to embrace collaborative learning as a fundamental part of the learning process. It is even further emphasised by the need to promote communities of learners within and across an organisation. The sharing of learning is increasingly seen as being key to an organisation's survival. Encyclopaedia Britannica, for instance, dismissed Wikipedia as a temporary fad, unable to compete with a centuries-old brand (Bruns 2007). Considering the inroads that Wikipedia has made as a first-stop resource serves as a warning to institutions to develop proactive strategies that would embrace the creative potential of the produser communities. HEIs are thus challenged to develop appropriate learning strategies and tools to combine separated communities, knowledge management, and learning (Rae *et al* 2006:225).

Individuals' knowledge and skills development resulting from group interaction is accomplished through collaborative learning. Some benefits of collaboration include improved learning, higher motivation, and preparation for the workplace. The numerous tools that came with the evolution of the Internet allow for synchronous and asynchronous communication in a much wider application of collaborative learning

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(Jeffrey, Atkins, Laurs & Mann 2006:32). Online learning tools allow students to determine how, what and when they access information. It is a dynamic environment that is personalised and customised in response to learner and environmental variables. One advantage is that it is available on demand and just in time. E-tools control learner interaction with content and presentation. The successes of using e-tools are influenced by many factors such as students' attitude, their perception of these tools and their technology background. Opinions and attitudes towards the modern aspect of eLearning differ greatly (Chawla & Jindia 2011:65).

Age diversity plays a big role in the interaction between individuals and the interactive information society, on how work performance is influenced as seen in generational theory research. Howe and Strauss (1991, 1993, 2000, 2007a, 2007b, 2008) imply that generational cohorts and how they react should be taken into account together with their shared values and the effect all of these have on work productivity. Experts differ on how to categorise each generation based on dates, the biggest problem being different countries of origin. The continuous internationalisation of universities, with growing numbers of students from different countries, would each fit a different profile in terms of the generational theory. In addition to the varying international student profiles, national student bodies at universities often represent students from extremely varied socio-economic backgrounds, which also have an impact on their profile fit, according to the generational theory (Taylor & Keeter 2010).

The current workforce is already challenged with users from different generations. Generation Y individuals already are more inclined to use technology than the X generation, while generation Z individuals will have even greater expectations regarding the use of advanced technologies. Generation Z individuals grew up with technology and are thus very comfortable with modern technologies like smart phones and social media (Barry 2010). Universities often perform first-year student profiling to better understand students' socio-economic backgrounds to determine their risk of not completing their studies. This could be used as an indicator of their attitude towards online collaboration as a tool for teaching and learning. For postgraduate students where research methodology is taught, the representation of all generations falls within one student cohort. Bruns (2007) places produsers as a generation C (for 'content'), as a successor to the generation X and Y. Generation C should not be perceived as individuals that fit a certain age group or socio-economic background, but rather a group that shares a set of common aims and practices that exhibit four fundamental aspects:

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- Community-based produsage contributes as a whole more and better content than a closed group of traditional producers only could accomplish.
- Fluid roles are initially based on personal skills, interest and knowledge but change as the produsage project proceeds.
- Unfinished artefacts are an inevitable reality of continual development following evolutionary, iterative, palimpsest pathways.
- Common property but individual merit is permitted for non-commercial community use while adaptation and further development of their intellectual property are rewarded by status capital gain in the development process.

Many individuals are now active consumers of IT. They are becoming increasingly familiar with technology and more and more intolerant of workplaces that do not accommodate them. Their laptops and mobile devices are almost always dual-purpose devices used for both business and personal applications (Moschella 2004). These individuals are expecting to use technology. Adding their positive inclination towards technology to the resistance of less enthusiastic staff and students only increases the complexity of the challenge.

Educational technologies in an innovative, interactive and collaborative environment largely depend on the design and use of learning management systems (LMSs). The design of LMSs often focuses incorrectly on the importance of information, technical issues and commercialised learning content rather than the learning processes (Amory 2012:2). Su, Bonk, Magjuka, Liu and Lee (2005:3) refer to technology-mediated online education as one of the most challenging types of interaction for academia due to the lack of experience with respect to learner interface interaction in traditional classroom teachings (Su *et al* 2005:3). Amory (2012:2) illustrates this point by highlighting a mistake made by lecturers in an LMS environment to replicate their traditional teaching practices. To challenge the notion that LMS environments replicate traditional teaching practices, Amory (2012) argues that “technology should not be the unit of analysis, but be part of a learning process”.

There are implications when considering the collaborative social dimension of Web 2.0 when the user advances from being a pure information seeker, to becoming an information provider. In first generation technology-mediated online education, the facilitator or instructor usually played the role of information provider, while the student fulfilled the role of information seeker. In a collaboration-rich environment the divisions in the roles of information seeker and information provider become vague when produsers are involved. While this state of affairs can be seen as a threat to higher education institutions it can just as easily be harnessed as an opportunity

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to engage and facilitate the shift from user/producer to produser in a heterarchical, instead of hierarchical (Bruns 2007) organisation of participants.

In an attempt to test students' willingness to transition into this role of produser a prototype of the collaboration portal was developed using recommendations found in the literature. To determine acceptance levels of the prototype, teaching and learning consultants (TLCs) from the University of Johannesburg were asked to review the prototype after which their suggestions were incorporated. Thereafter students registered for research methodology did a heuristic evaluation of the prototype. The results were analysed and recommendations were made to improve the prototype.

This study is built on the principles of educational design research. The ongoing project investigates the possibility of using an online collaborative platform for the teaching and learning of research methodology towards establishing an interdepartmental and possibly an interfaculty collaboration and learning portal. The next discussion focuses on the educational design research followed in the study whereafter the findings of the heuristic evaluation of the prototype are reported.

EDUCATIONAL DESIGN RESEARCH

Educational design research is defined by McKenny and Reeves (2013:7) as

[A] genre of research in which the iterative development of solutions to practical and complex educational problems provides the context for empirical investigation, which yields theoretical understanding that can inform the work of others.

Reeves (2006:52) suggests that improvements in technology-mediated teaching and learning can be enhanced by using the principles of design research as a model of inquiry. Due to its intensive and long-term collaboration between researchers and practitioners, as opposed to once-off quasi-experimental studies, education design research is gathering momentum as an iterative developmental approach to finding solutions to the real-life setting of educational problems.

The iterative approach implies that the research develops over time through multiple iterations of investigation, development, testing and refinement. Several sub-studies with complete cycles of inquiry take place within one larger study (Figure 15.1).

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FIGURE 15.1 Process display of a design study
(Source: McKenny and Van den Akker 2005:49)

Researchers agree on more or less the same three stages pertinent to the process, namely preliminary research, prototyping phase and assessment phase. This chapter contextualises the testing of the first prototype of the online collaborative teaching and learning platform for offering research methodology to commerce students in a coursework master's programme at one university.

This study was conducted through heuristic evaluation applying a set of usability principles against which the designed prototype was evaluated (Pickard 2013:131). Heuristic evaluations are essentially free-flow evaluations as opposed to task-based evaluations of cognitive walkthroughs (Pickard 2013:313). Two small groups, one with two evaluators (TLCs) and one with six evaluators (master's degree students) were identified. The reasoning behind smaller evaluation groups are that information saturation is generally attained at this level, while exceeding this number creates an overlap of identified issues which outweighs the benefits of additional evaluators (Pickard 2013:132). For the purpose of testing a first prototype, the group sizes were deemed sufficient.

The TLCs from the Centre for Academic Technologies (CAT) at the University of Johannesburg were purposively sampled. The role of CAT is multifunctional from a professional academic support services perspective. TLCs serve the role of learning designer, which besets a range of tasks within a more constructivist-learning environment within higher education. Consequently learning designers need to incorporate activities such as advising on pedagogical principles, evaluation of learning materials, advising on writing style and readability, and designing layout and appearance of materials. The increasing trend for using the Web as a medium

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to present courses has further influenced the role of learning designers to focus on the affordances of Web technologies for delivery. As a result their learning design activities also include the appropriateness of technology to address learning needs, determining the pedagogies, resources, and delivery strategies of a learning environment (Seeto & Herrington 2006:741-742). Therefore the inclusion of the TLCs provided valuable contributions during evaluation of the prototype.

The group of master's students enrolled for the research methodology module in the MCom (Business Management) qualification consisted of a voluntary sample. In usability testing the evaluators asked to perform tests are the actual users who will typically be using the system (Pickard 2013:129). The willingness of the ultimate users of the system ideally suited the profile of evaluators that was required for the first prototype testing.

Data were collected through the heuristic evaluation without a predetermined location to test the flexibility of anytime, anywhere access applicable to technologies that are mobile technology compliant (Pickard 2013:128).

The data are reported numerically, but the interpretation was intended to be of a qualitative nature and the limited number of evaluators chosen enabled the researchers to do the analyses individually. During the initial prototype design the TLCs identified were asked to review the prototype and make suggestions. A heuristic evaluation allows for systematic inspection in order to allow for the identification of usability problems through an iterative process (Pickard 2013:133). The outcome of the heuristic evaluation is presented in the form of a rubric aimed at highlighting areas of high, medium, or low agreement to the principles addressed and discusses the eventual success or failure of the prototype to achieve its goal. The responses from the open-ended questions were also evaluated and are reported on.

FINDINGS AND HEURISTIC EVALUATION FEEDBACK

After engaging with the prototype, evaluators completed a heuristic evaluation on 13 design principles that required a rating of low, medium, or high agreement. The feedback from the evaluators is presented in Table 15.1 and a discussion around any similarities or differences that emerged from their evaluation follows. Both a tablet and a computer browser were used in the testing of the prototype.

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TABLE 15.1 Heuristic evaluation feedback (TLCs n=2; Students n=6)

Principle	Low		Medium		High	
	TLC (n=2)	Students (n=6)	TLC (n=2)	Students (n=6)	TLC (n=2)	Students (n=6)
Screen information is in a natural and logical order	0	0	0	3	2	3
Facilitates user's decision making and task processing	0	0	0	5	2	1
Provides easy navigation to any section	0	0	0	1	2	5
Provides easy access back to the home screen	0	0	0	1	2	5
Is quick and easy to use	0	0	0	2	2	4
Is designed to be visually pleasing to the user	2	0	0	1	2	3
The use of multimedia improves the user experience	1	0	1	2	1	3
The Google forums bring a useful collaborative dimension that will promote and stimulate discussion	1	0	0	2	2	3
The content rather than the technology drives the application	0	0	0	4	2	2
The Google forum and Twitter feed create a sense of community (from an online social platform perspective)	1	0	0	3	2	2
This tool creates a sense of learning with technology rather than learning from technology	0	0	0	3	2	3
This tool is convenient (can be accessed any time, from any destination, when it suits me best)	1	0	0	2	2	3
The prototype is generally appealing to use	0	0	0	3	2	3

In general there was consensus between the two TLCs when scoring the prototype, while the students showed greater varying opinions. This can be ascribed to the expectations of the two groups of what a first prototype is supposed to look like. From the nature of their work, TLCs are much more familiar with prototyping than the student user group who are generally only exposed to completed systems or websites.

Feedback regarding the impact of multimedia use on the user experience indicated the request for more multimedia such as video, animations and sound to be included. As this is the first prototype for the collaboration platform, this suggestion is deemed to be reasonable and valuable as it supports what was certainly planned for subsequent prototypes. Ease of navigation was another aspect highlighted to be improved. Back buttons taking a user back to a previous screen in addition to 'breadcrumbs' showing a user where they have navigated from could potentially be corrected once the user fully engages with the system and learns the system functionality. However, this remains a matter that will be explored in future prototypes to ensure continuous easy navigation.

The open-ended questions allowed deeper insight into the evaluators' willingness to collaborate, fears for privacy and rights, general attitude towards online interactive learning and general likes and dislikes of the prototype. On the user's willingness

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and acceptance level to contribute to online forums, responses indicated a definite willingness, with some caution that contributors would prefer to know the peers with whom they share information. In addition, issues relating to “hacking” and “freedom of speech” as possible concerns added to “transparency and honest sharing of information” were indicated as important factors to be managed in such a collaborative platform.

Concerns regarding privacy, information and identity protection issues were that participants in online discussion platforms have to ensure their own devices are protected with an “antivirus and firewall as not to compromise a gateway to other users’ computers”. Furthermore, evaluators indicated that their participation in online collaborative platforms are only to be disclosed to course participants as social media is involved and privacy issues may not always be considered as ‘academic’ participation.

The evaluators’ general attitude towards online interactive learning when considering this prototype against other learning systems was both positive and cautious. One response indicated that the acceptance of eLearning as an undeniable reality in the South African techno-culture society is long overdue. Another response considered the fact that when studies are not taken full-time and are not necessarily campus-based, then seeing lecturers on a regular basis in person is not practical. These tools allow a student to get the required information in real time from any location and must thus be lauded. The collaborative appeal of the system allows students to discuss topics moving beyond traditional textbook-based approaches. However, fear of being misinterpreted was a response reflecting a cautionary approach to interactive learning environments.

The last open-ended question focused on likes, dislikes and recommendations for the improvement of the prototype. Suggestions for improvement to the prototype included the creation of at least one group in Google to allow participation. Another was more focused on formatting and layout, recommending the use of arrows. The inclusion of better graphics was indicated by all the student evaluators. This being a prototype confirms the suspicion that the expectations of the master’s degree students towards what a prototype should look like are slightly higher than what should be expected.

The feedback from the evaluators provided insight into the requirements for a second prototype that need further investigation. Considering the feedback and linking this to further literature on the topic the preliminary recommendations for the next prototype are taking shape as a result.

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USERS, PRODUCERS AND PRODUSERS – THE WAY FORWARD

Bruns (2007) suggests that such a heterarchical approach rests on four pillars that he calls the C4C (generation C harnessing four Cs, namely collaborative, creative, critical and communicative capacities).

In terms of the creative pillar it is not seen in the narrow artistic sense, but rather fundamentally concerned with content creation focusing on the development of the creative capacity. In order to collaborate effectively it is crucial to know when, where and with whom one chooses to collaborate, and under which circumstances. It is critical to understand the consequences of collaboration, particularly because online collaboration is subject to rapid and continuous change which requires lifelong personal interest in updating technological skills.

The pillar termed ‘critical’ refers to the need to be able to discern the trustworthiness of produsage-produced artefacts. While communication underpins every human endeavour and is implicit in the three other pillars, effective and successful communication is a prerequisite between the collaborative produsage participants.

Considering the findings of the heursitic evaluation and the literature reviewed, the prototype requires some adjustments and is conceptually visualised as depicted in Figure 15.2.

FIGURE 15.2 Adjusted approach to the conceptualisation of the collaboration platform and knowledge repository

Participants in the collaboration platform might use different Web 2.0 technologies such as wikis, blogs, video sharing or discussion forums to contribute to the various discussions or knowledge contributions. A blog dedicated to questionnaire

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development, for instance, would require a dedicated expert or a team of experts in questionnaire development to take ownership and accountability for the discussions taking place in that blog. Peers and the expert might evaluate contributions that have been most valuable and the contributions or shared knowledge then goes through a vetting process by the peers and expert reviewers, using the C4Cs as suggested by Bruns (2007), to escalate valuable contributions to a knowledge repository for long-term storage and sharing. This knowledge repository would have to be classified and have a good searchable function in order to navigate through the continuous contributions that are captured there.

In this way learners may learn collectively, in a less lonely supervision environment and the repetitive nature of supervision can be buffered when supervisors refer students to previously captured knowledge in the knowledge repository. The knowledge repository also remains dynamic and fresh through a continuous influx of valuable and new knowledge contributions. The collaboration platform can then be 'cleaned up' for a new set of contributors when a new module intake commences seeing that the valuable insights are moved to the knowledge repository.

This concept certainly requires further planning and deliberation, testing and evaluation as typified by the education design research process by developing prototype two for testing.

CONCLUSION

Since this study focused on one module within one faculty it is not yet known to what extent acceptance of the concept would stretch across multiple departments and faculties. If the changes over the past few years in the supervision of students at HEIs are an indicator of what can be expected in the future, it is critical that supervisors change their approach towards supervision. It can no longer be assumed, if ever it was, that students have an equal or acceptable standard of research methodological and design skills training, putting greater pressure on supervisors to offer remedial guidance. Furthermore, demanding supervisor-student ratios and a need to compete in a knowledge economy necessitate a creative and innovative approach to equipping students with appropriate skills in research to ease the burden of the supervisor. The analysis and design of an online collaborative platform for the teaching and learning of research methodology is intended as continuous and foundational support during the supervision process of research projects.

It is envisioned that this kind of collaboration platform and the subsequent development of the knowledge repository could relieve the strain on HEIs' resources by creating a collective collaborated peer- and expert-reviewed knowledge source.

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Knowledge sources are potential knowledge assets that become a commodity within the knowledge economy.

Careful planning and continuous improvement in the education design research approach could result in the needed joint approach between pedagogy and technology that could reduce the duplication of effort and knowledge in the postgraduate supervision process. Online learning amplifies the potential for collaboration as it provides access outside of the classroom for meeting and exchanging ideas. Fostering collaboration skills as produsers prepare students to become creators of content at the onset of their research journey, hopefully making it a less daunting and lonely environment to be in.

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