

Tapping the potential of the Internet in the classroom: a case study

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ABSTRACT

The internet may well change the way lecturers think about teaching, but many of these changes could have happened without the Internet. The real potential seems to lie in the way it changes the relationship between teacher and student, forcing the lecturers, the students and also the institutions to rethink their behaviour and attitudes. In this article, the potential of using the internet in face-to-face teaching will be explored, based on my personal experience with using the internet in teaching an Introduction to Business course at Midrand University in 2000. What emerged from the experience was that something as simple as a website introduces sufficient new elements into the classroom system to change the system of relationships and the awareness of all participants in the system. The change in awareness and relationships, more than the internet change in the methods or tools, seems to explain most of the benefits derived from using the in the classroom.

INTRODUCTION

Many debates about whether the internet will replace the lecturer (especially those of the face-to-face variety) are misguided. Such debates assume that using the internet in the classroom is simply a matter of adding new technology without any other changes taking place. The potential of the internet is thus seen as its ability to make education more efficient. Thinking like this may well make education more efficient, but will at the same time also bring isolation to education. This is because each educational medium (be it the internet, the textbook, the study guide, the lecturer) adds certain unique benefits to the educational process. It is by using each medium in such a way that it makes its unique contribution relative to the others that one taps its potential. Adding a new element to the educational process changes the process itself and makes new connections and unknown synergies possible. By this logic, it is not only the internet's potential in the classroom that lies hidden, but also the introduction of the internet may show that the other media can be used in ways never thought of before.

The purpose of this article is to explore this unknown territory of the potential of the internet in face-to-face teaching. This will be done primarily by analysing my experience with the use of the internet in teaching an introductory business course at Midrand University in 2000. The ambitious vision and the eventual reality will be compared to determine what unique contributions the internet made in the classroom and which actions prevented the potential from being achieved. The findings will also be compared with other discoveries of the internet's potential, in order to conclude with guidelines for lecturers and universities attempting similar quests into the land of potential.

FINDING POTENTIAL

Finding the potential of a new technology is always difficult. Examples of underestimating potential abound - IBM is famous for a study they commissioned which estimated a total worldwide demand for fewer than ten computers. The cause of underestimations is that people tend to think of a new technology in terms of old ones. For example, the computer may initially have been seen as nothing more than a fast calculator with lots of memory.

The same applies to the internet, and specifically to internet-based learning. Some lecturers think of the internet as simply a worldwide database of information or a powerful communication system. Many web-based courses are nothing more than so-called page-turners, maybe with a chatroom attached and possibly some moving pictures. This shows that

many instructors still think of the internet in terms of the old media, ie a collection of electronic "textbooks", virtual "classrooms" and educational "movies".

By thinking in terms of these old elements, one is limited by their individual capabilities and cannot tap the potential that lies in the synergy created by bringing old and new elements together within the internet. Hilf (1998:4) makes the point eloquently: "If the new media industry is satisfied to follow the pattern of the past, following the production models of the established media, it must also be content to live within the same ceilings and boundaries of those former media types".

Because potential is about what is possible, it is difficult to judge and impossible to see. Some of the ways to find a technology's potential are to look at it with new eyes, to think about it like a beginner, to find new metaphors to describe it, or simply to experiment. It was the route of experimentation that led to the ideas presented in this article.

THE STARTING POINT

In July 2000, I was given the task of designing a semester course to introduce a group of graphic design students at Midrand University to business. Since I was given a great deal of freedom, I decided to develop the course around a specific outcome using a website as the coordinating mechanism. Since I had no budget or special training, I worked under a number of constraints, which made it impossible for me to develop the things that one might expect such as flashy multimedia, discussion forums and chatrooms. This made the more conventional use of the internet in teaching impossible.

But ignorance combined with idealism can sometimes be useful. Based on a review of some literature, I developed a good idea of what I wanted:

- The course had to have an overarching practical outcome and be developed with outcomes-based education principles in mind. I wanted the outcome to motivate students to construct their own knowledge and understanding of business.
- Given the misconception that the internet threatens the lecturer, I wanted to use the internet in such a way that it complemented my teaching, but I also wanted my teaching to complement the internet tools I used. Each of my resources (classroom teaching, study material and internet tools) had to make contributions that the others couldn't make.
- The methods I used would not have to require special knowledge or additional resources beyond those that already existed at the university.

THE IDEAL

The closest I could get to a practical outcome was to ask the students to develop a plan (either a strategy or a business plan or a combination) for a business they would like to start one day. This would then provide the learners with a framework in which to place the knowledge they gained during the semester. The next step was to provide them with a basic foundation and overview of Economics and Business Management. Given this foundation and framework of knowledge, constructing the rest was up to the class.

The curriculum depended on what the class wanted to learn - they told me what they needed to know to advance toward their outcome, and I provided it. The class divided itself into groups. At the end of every week, each group had to decide what they needed to know, and presented me with a list of three to five questions. I would then categorise the questions, prioritise them (according to popularity at first, and later according to important gaps in their knowledge that had not been addressed yet) and posted it on the course website. I also looked at all the questions, and if any of them had been answered during the week, I moved them from the "Questions not yet answered" subcategory to the "Questions answered" subcategory. During the weekend, I prepared the material for the week ahead based on the prioritised questions.

As I discussed the material in the week that followed, new questions would be asked; sometimes I suggested some as well. If I was unable to answer a question immediately (because I did not know the answer or because there was not enough time), I requested that the question be handed in at the end of the week. The students had to consult the website during the week to check on the current questions in order to see what unanswered questions they still felt had to be answered so that they could achieve their own outcomes.

The list of questions inevitably grew faster than I could answer them, which led to some friction between the class and myself. This could have been an indication that the students were not comfortable with their new role as required by this approach (even though I spent two weeks explaining it, answering objections and soothing their fears). The approach required the students to become responsible for their own learning. But their experience with other teachers and lecturers reinforced the misconception that I should be the all-knowing lecturer and that I was paid to provide neat and comprehensive answers to all questions as quickly as they were asked. To assist them in finding answers to questions I could not answer, I used the website to provide references to textbooks for answers to questions and links to useful sites and articles on the internet.

I also required each group to organise a guest lecturer on areas that had not been addressed yet. During the semester eight guests addressed us, and I was surprised by the quality of speakers that my students had access to. I wrote up two of the talks as articles (a millionaire who spoke on the secrets of business success and a web developer who spoke on how to set up an e-commerce business) and handed them out to the students.

I had wanted to provide summaries on the website of all questions answered, thereby creating an evolving knowledge base for the course and the class. Unfortunately, due to lack of time, students had to be satisfied with my simple outlines of topics that had been covered as well as references to articles, websites and textbooks. I never placed the articles and outlines on the website, though it would have been a good way of getting them to consult the site. However, at that stage, resistance to my approach from some students was already quite strong, and I decided to use more paper-based material to make them feel more comfortable.

THE REALITY

The biggest problem I experienced was the resistance from some students. They wanted me to follow the more conventional lecturing approach. The most common reason they expressed was that they were not studying graphic design in order to start a business one day, and would never need to start one.

The resistance surprised me. For the first two weeks I explained the approach to the class and opened each lecture in the first few weeks thereafter with a discussion of the approach. Each time, students brought up problems and I addressed them as well as I could. I continued doing this until about six weeks into the semester, which I felt was the point of no return. Up to that point I had been willing to change the approach and even discard it completely if students were uncomfortable with it. In the seventh week, a significant minority of students suddenly stated that they wanted me to discard the approach completely. By this time it was not possible, but this nevertheless forced me to water down the approach to prevent destructive conflict in class between the "anti" group and the "pro" group.

Here are some of the other problems and how I tried to solve them:

- Students did not know what questions to ask. To overcome this I provided an overview of the broad topics that might be covered as well as a visual framework.
- Many groups only wrote down their questions minutes before they were due (which indicated that few consulted the web site). Little thought and reflection therefore went into their questions, which defeated the purpose of the questions. Eventually (in the last month or so), I was forced to lecture without regard to their questions, in order to

ensure that we covered all the relevant areas necessary for them to achieve the course outcome.

- Toward the end of the course, questions started becoming more diverse. This may have been partly the result of students not putting much thought into their questions or not having started their assignments. The increasing range of topics made it difficult for me to decide which questions to answer, and students were therefore not sure which questions would be answered. To solve the problem, I took the easy way out - in the last month I no longer required students to hand in questions. A better solution may have been to ask students to focus their questions in specific areas. Another possible solution would be a chart of some kind, showing how well certain areas have been covered, and excluding the best-covered areas from further questions.
- The course covered too wide a range of topics. Once again, the visual framework was useful to show how the topics were related. However, it remained a problem until I related the visual framework to the final assignment as well.
- Many students said that they had too much information and too many ideas, and had no idea of where to start or how to structure their assignments. Complaints persisted even after I provided them with a framework and outlines of topics covered. I believe that this struggling to make sense of information and complexity is a problem faced by most knowledge workers, and regard it as an essential part of the learning process. However, in the end I capitulated, and provided the class with a possible structure for their assignment together with some questions to guide them.
- No single resource was available with all the information students needed. This problem was impossible to overcome unless students took responsibility for their own learning, which did not happen in most cases. Learning in real life draws from a diverse range of sources, and my course attempted to mimic this real-life learning by using different sources (books, lecturers, guest speakers, articles, internet).
- Students felt safer with a more conventional approach and preferred to get notes. I responded by providing outlines of each week's work, together with references to web resources and to articles and books in the library.

My response to some of the problems led to a significant watering down of the ideal. I felt that this was necessary due to the culture at Midrand University, where a lecturer can be removed from a course at short notice if the lecturer evaluations completed by students show that they dislike the lecturer or the approach followed.

DID IT MAKE A DIFFERENCE?

Despite the watering down of the approach, the addition of a simple website (and the accompanying tasks) seems to have brought about a change in the relationship between myself, as lecturer and the rest of the class. This change in the relationship explains many of the benefits and problems that the approach created. A brief look at the main benefits from the specific approach I followed will be the starting point for us to identify the potential of the internet in the classroom.

- **Immediacy:** students could access information at any time and did not have to wait for the next lecture to gain new information.
- **Tangibility:** the website made student and group learning tangible. Progress was made evident through the constant updating of the site. It became a knowledge base, a kind of group memory of the knowledge that had been covered and created throughout the course. If all answers to questions were captured, students could have printed them out at the end of the course, and had their own custom-built textbook on all the topics that mattered to them.
- **Reality:** the experience approximated learning as it takes place in the real world. Some of the real-life learning problems that they had to face were: applying technology in learning, consulting a much wider range of sources compared to what traditional courses required, coping with the growing number of questions relative to the number of answers, and having to set their own boundaries in terms of what they wanted to learn and communicate. For learning to be effective, it has to mimic the

way learning takes place in the society learners will enter. This approach attempted to mimic the transactional systems of the information society, as opposed to the conventional classroom that mimics industrial society in many ways (Tifflin & Rajasingham 1995:73-76).

- Extension: the abilities of both the lecturer and the students were extended. The site became a resource and information centre, extending the capacity of the lecturer (as long as the lecturer researched good resources on the web and made them available). The website, and the tasks accompanying it, also extended the ability of the students to design their own learning experience within limits.

These benefits emerged from the new lecturer-student relationship, and in turn also had an impact on the relationship. Most of the problems experienced also emerged from this changing relationship, as it exposed inconsistencies between the approach and my lecturing style, student expectations, and the larger university system. The underlying cause of the resistance was feelings of insecurity and confusion due to the observed inconsistencies, as old unconscious ways of thinking and doing remained unchanged and clashed with the new. DeLong (1997:6) supports this finding when he says "that the fundamental challenge presented by the Web to higher education is not technological but cultural - not to its curriculum and pedagogy but to its outlook and values".

Becoming aware of the inconsistencies will enable one to identify in advance some of the changes that need to take place to tap the full potential of the internet in the classroom. The inconsistencies in my approach and some of the problems they caused were:

- Inconsistency with lecturing style: the approach required students to participate in designing the curriculum and some elements of the learning experience. However, when I lectured, I mainly employed the conventional one-way talk-and-chalk method. It was probably partly because of this inconsistency that I had discipline problems during some of the lectures. The mere fact that I expected "discipline" showed that my thinking was in some ways inconsistent with my approach, and the students realised that too.
- Inconsistency between authority and responsibility: while the approach shifted greater responsibility to the student, the assessment of the final assignment was still done by the lecturer without any input by the student. This effectively defeated the purpose, and made the students feel insecure. On the one hand they had to do more in a different way, but on the other hand their lack of authority and power remained unchanged. This violates the well-accepted parity principle found in management literature, which states that when someone is given more responsibility, that person's authority must increase proportionately to enable them to execute their tasks effectively (Smit & Cronjé 1997:248-249). This may explain why students continuously asked for specific guidance about what sources they had to consult and what exactly they had to write in their final assignment, and why they complained about the diversity of sources and topics covered.
- Inconsistency with university environment: while the approach was fairly innovative, the larger system of lecturer evaluation encouraged lecturers to keep students happy by sticking to what works : handing out extensive notes and prepackaging information. Under this pressure I, like my students, felt increasingly insecure whenever something failed to work out as expected or when a student complained, and therefore I felt compelled to make significant adjustments to the approach I had envisioned.

Creating a safe environment (physical and psychological) is essential if one wants to educate people according to the principles of adult learning (Vella 1994:6-8). Unfortunately, the inconsistencies created insecurity for both the lecturer and students, and prevented all participants from experiencing the full potential of my use of the internet. It is therefore necessary to look at some of the other benefits that could have appeared under improved circumstances if one is to get a better idea of the full potential of the internet in the classroom.

OTHER DISCOVERIES OF THE INTERNET'S POTENTIAL

The conventional discussions of the potential of the internet in education focus mainly on how it changes the content of the learning process. The view of the widely read Hambrecht Report seems to have pervaded thinking in education and training circles; one of its phrases, "content is king", is heard in many discussions on the future of internet-based learning. It also propagates the idea that web-based learning is a type of distance learning. The main benefits of web-based learning that the report identifies are making content available anywhere, anytime to anyone; travel cost savings; ease of updating content; personalisation of content; making learning less intimidating; and greater interaction between learners (Weggen & Urda 2000:6-7).

One of the more interesting documents that attempt to expand on the unique benefits the internet brings to education is a case study by Ruhleder and Twidale. In it they show how the use of the internet brings about benefits similar to the music masterclass. A masterclass is a cyclical process that starts when a student comes with a prepared piece, performs it, and then receives feedback in real time from the audience of teachers and peers which can be immediately incorporated into the next performance. Ruhleder and Twidale (2000:3-4) identify the following similar benefits from the masterclass and the use of the internet in education:

- New focus on collaborative iteration: a student's output can be posted for comment by their peers and the teacher. This continuous refinement can happen several times in a very short period until the student is satisfied.
- Creating a new expectation of development: not only do students expect joint development of their output, but those who provide feedback expect that the recipient will reflect upon the feedback and incorporate it into future efforts.
- Mutual availability of feedback and change: students can now see each other's work and so learn from their peers' successes and mistakes.
- Multiple levels of contribution: feedback can come from a wide range of backgrounds and perspectives and the feedback itself can range from the very specific to the level of abstract principles.
- Context-based exemplars: student and peer actions can be contrasted with the ideal in real time, bringing about faster learning.
- Reification: the teacher and students can refer back to any previous student actions to identify and illustrate concepts under discussion. Abstract principles and exhortations thus become concrete and easier to follow.
- Reflection: posted output and contributions can remain for as long as the class wants so that participants can return to them for review and reflection.

Most of the above benefits can only be enjoyed if there is interaction, and it is an interaction made possible by the introduction of the internet. In Ruhleder and Twidale's (2000) case study the interaction is assumed to happen only online, but the mentioned benefits can also be enjoyed if the face-to-face interaction of the music masterclass is combined with online interaction, as with my approach.

As a summary, one could categorise the potential (or unique benefits) of using the internet in the classroom into two areas: firstly, its influence on content of the learning process and secondly, its influence on the interaction during the learning process. Tabulating the benefits identified from my approach as well as the Ruhleder and Twidale case study, it seems as if the greatest potential lies in the area of interaction during the learning process (see table 1):

Table 1
Categorising the benefits

	Content of learning process	Interaction during learning process
My approach	Immediacy Tangibility	Reality Extension
Ruhleder & Twidale	Reification Reflection	Collaborative iteration Expectation of development Mutual availability Multiple levels of contribution Context-based exemplars

While a clean categorisation is difficult, the information in this table casts doubt on the idea that the internet's potential in the field of education lies mainly in the delivery and management of content. Based on a historical study of communication technologies, Odlyzko (2001) also challenges the notion that "content is king" on the internet. Odlyzko's study was not only focused on the educational uses of the internet, but his argument is similar to the conclusion that can be drawn from the table, namely that connectivity is more important than content. Palloff and Pratt (2001:152-153) also state that their experience has taught them that even for purely online classrooms "course development needs to focus on interactivity, not content".

WHAT TO LOOK OUT FOR IN THE QUEST

Once one accepts that the potential of the internet in the classroom can be tapped by focusing more on the development of interaction, one can also more clearly identify what may sabotage the quest for finding that potential. The most lethal destroyer of the potential that was hidden in the approach I followed, was a lack of awareness that the introduction of the internet into the classroom changed the relationships among all participants. The internet does so not only by "democratization of information" (DeLong 1997:5), but also because the medium of the internet conveys a message that is different from that of other educational media.

Postman and Weingartner (1968:16-24) in their classic text *Teaching as a subversive activity* explain that McLuhan's aphorism "the medium is the message" is just as true in the classroom. Conventional lecturing conveys a message of lecturer-power or institutional power, while the internet conveys the message that power is decentralised or is rather found in the network of knowledge. If institutions attempt to introduce the internet into classrooms without changing anything else, they will merely be pouring new wine into old bottles. The message of the internet is inconsistent with the lecturing approach, the authority given to students and many institutional policies and practices. Without proper alignment, lecturers will find either that the internet makes no difference in their classrooms or that they spend a lot of time fighting the resistance offered by students who mistrust inconsistent messages.

Some of the specific lessons I learned about making my actions as a lecturer more consistent with my use of the internet in the classroom were:

- Do not decide on an approach beforehand and then try to persuade learners to accept it. Rather ensure that students understand the need for the course and a

different approach. A pre-course needs assessment - in consultation with department heads, industry and a sample of students - could be more consistent with the approach.

- Do as much as possible in the beginning to make the students feel safe. A feeling of uncertainty and lack of safety cannot be eradicated easily once it has taken hold.
- Use a case study lecturing approach and other more participative approaches that are more consistent with the broader approach.
- Students can be expected to do many of the things I did eg categorising questions, prioritising questions, answering questions and posting their answers on the website, and finding other resources. As with Amazon.com, students could even have been expected to rate the contributions of their peers, e.g. resources or answers that other students posted on the site. This rating could then be made part of the overall assessment.
- As for assessment, greater student involvement would also be more desirable. This involvement can be extended into assessment with students defining what a quality outcome would be and assessing themselves and their peers (see Pirsig 1974:208-213 for an interesting description of how this can be done).

Institutions can also learn a number of lessons from my experience with the approach:

- The internet has the potential to enhance face-to-face lecturing rather than replace it. In fact, it creates a need for the lecturer, albeit in a different role. Both the student's and the lecturer's roles need to change (see Palloff & Pratt 2001:153), and institutional policies and accepted practices should reflect this.
- Even using the internet in the classroom on a small scale requires a rethink of online and face-to-face teaching practices to make it effective. It may well lead to approaches where students learn more in shorter periods and are better prepared for the world of work. For an institution that wants to generate a reputation for high quality and innovative teaching, this would be ideal.
- The institution must be tolerant of experimentation, since effective and innovative practices are only found by exploring territory that is unfamiliar to both the lecturer and student. If innovation is not rewarded and supported or if risk-taking is not supported, one can expect most lecturers to stick to old methods and practices for as long as the institution exists. Palloff and Pratt's (2001:154) experience is also that web-based learning is more successful if the faculty members involved are supported.
- A consistency in approach must be created between lecturers. Even if other lecturers don't follow the same approach, at least they should not erode what others are doing. For example, if some lecturers prepackage all the information for their students, this could easily cause students to resist constructivist approaches that require them to take more responsibility.

CONCLUSION

Educators will only tap the potential of the internet if they realise that most of that potential can be found in the interaction and relationships made possible by the internet. The internet is less a tool for managing learning content, and more a tool for creating learning connections. But educators also need to realise that the internet also subverts old relationships. If educators and their institutions fail to align their methods and general culture with the changes brought about by the internet, then they may find that using the internet destroys more connections than it creates.

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