

# Barriers to students' use of electronic resources during lectures

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## ABSTRACT

This paper highlights one of the barriers for implementing an educational technology policy at a higher education institution. As more courses use a Learning Management System (LMS), learning resources are electronic and an increasing number of students are using Notebook computers for accessing electronic resources and reading on the screen. However, there is a dichotomy between provision of electronic resources and students being allowed to use Notebooks during classes. This paper explores lecturers' ambivalence towards student use of Notebooks during classes and illustrates how such perceptions are becoming a barrier to successful implementation of an educational technology policy.

## CATEGORIES AND SUBJECT DESCRIPTORS

K.3. [Computers and Education]: Computer uses in education Language— *collaborative learning, computer assisted instruction, and computer managed instruction, C5 Computer System Implementation-portable devices.*

## GENERAL TERMS

Human Factors, Theory, Management

## KEYWORDS

Electronic resources, e-learning, resource constrained environments, Learning Management Systems, Structuration

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## 1. INTRODUCTION

Mobile devices have potential to enhance learning and transform pedagogy [3, 7, 8, 9]. Some of the uses in education include their use by teachers for writing process pedagogies [7], and by students for note taking, quick accessing of learning materials and applications and finding relevant materials [3].

Kuh and Vesper's [5] study on the relationship between student use of computers and cognitive and development gains reported that students who used computers more often outscored those with low use on every developmental gain like writing clearly, ability to learn independently, and understanding other people and science. Despite these affordances there are several barriers to implementing e-learning at institutions. Jordan and Jameson [4] outline barriers for staff on the path to an e-University as: institutional distractions and lack of focus; perceived unclear leadership; models of learning selected inappropriate for e-learning; e-University project perceived as a threat by some e-critics or not considered at all by many; staff involved already overloaded; risk to staff of poor e-materials, lack of support and training. Van der Merwe and Mouton [10] report that lack of commitment to change by faculty members is a result of: the

time investment needed to learn how to integrate Information and Communication Technologies (ICTs) effectively into teaching and learning activities; the time it takes to develop, maintain and participate in online learning activities; lack of incentives and rewards for teaching and learning in general; lack of reflection on teaching and learning itself; and lack of understanding of the potential benefits of ICTs for teaching and learning activities. In this paper, reflections on teaching by educators are used to unravel the problem of access to electronic resources by students who own Notebooks but cannot be allowed to use them in class. This paper argues that as institutions move towards wide use of learning management systems, an increasing amount of resources is available electronically, and students will be expected to bring to class electronic resources, to annotate readings and take electronic notes. Thus, the question we sought to address was: To what extent is the educators' ambivalence to students' use of Notebooks in class a condition of a lack of understanding of the benefits of ICTs for teaching and learning.

## 2. LITERATURE REVIEW

The use of a computer as a medium for reading and interacting with course materials offers advantages such as efficient

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searching, convenient storage of large amounts of information, and navigation via hyperlinks that connect sections of text [6]. Graetz [3] argues that the migration to the web of content traditionally delivered by instructors in lecture format is helping shift the function served by brick and mortar classrooms from information delivery to collaboration and discussion.

This paper contends that in resource constrained environments such as developing countries where students have limited access to the Internet, the value of web content is evident when learning resources are downloaded and read offline. This means that students do not need to be online to read resources nor incur unnecessary printing costs as they can read resources from standalone Notebooks. Most lecture rooms at this contact university are not wireless hotspots.

### 3. CONTEXT

The University of Cape Town (UCT) is regarded as a (transformative) international African university (UCT Mission Statement) whose student clientele is drawn not only from different African countries but the world over. In 2006 a total of 21 562 students enrolled at UCT<sup>1</sup>. Consistent with its agenda to adhere to the global agenda of transformation, UCT has strived to retain a balance between diametrically different values of maintaining global educational standards on the one hand, and retaining a bona fide African institutional identity on the other, thus putting this giant institution in an ambivalent position fraught with both opportunities and challenges. One such opportunity has been UCT's visibility as early adopter of modern technologies such as the open source Sakai learning management system, locally branded as 'Vula,' among others. UCT also provides burgeoning access to online databases, printing facilities, digital archives and online search for books in libraries has since become the norm rather than an exception for both students and researchers alike. The challenge, however, lies in the receptivity of lecturers to student use of electronic resources during their lecture sessions.

### 4. THEORETICAL FRAMEWORK

The question of educators' ambivalence to students' use of Notebooks is about rules and resources on the one hand, and reproduction of relations between actors or collectivities organised as social practices and conditions that govern the continuity of transformation of rules, on the other. To this end, the study draws on the Theory of Structuration. The Theory of Structuration takes the view that human action is an expression of a mutual dependence of structure and agency [2]. According to [2], structures are about rules and resources but rules and practices only exist in conjunction with one another, hence the duality of structure. In Figure 1, the duality of structure is illustrated.

**Table 1: Definitions of structure, system and structuration**  
(Source: Giddens, 1979: 66)

STRUCTURE	Rules and resources organised as properties of social systems. Structure only exists as 'structural properties'
SYSTEM	Reproduced relations between actors or collectivities, organised as regular social practices

<sup>1</sup> <http://www.uct.ac.za/about/intro/statistics/>

STRUCTURATION	Conditions governing the continuity or transformation of structures, and therefore the reproduction of systems
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Our assumption is that Structuration theory will help to uncover structure, system and their structuration through exploration of the interplay between human action and social structures. Giddens [2] postulates that structure forms *personality* and *society* simultaneously – but in neither case exhaustively: because of the significance of unintended consequences of action.

### 5. METHODOLOGY

Twenty students were interviewed on their attitude towards use of Notebooks in class and the extent to which they felt Notebook use enhanced meaningful learning for their courses. Half of these students owned personal Notebooks and the remainder did not. Convenience sampling was used to select students with Notebooks and these were personally approached for the conduct of in-depth interviews. Those without Notebooks were randomly picked on the basis on their sex for in-depth interviews as well. To provide a more informative view of Notebook use, six lecturers in different departments, four of whom taught the interviewed students were also interviewed in connection with their perception of Notebook usage, with particular reference to enrichment of students' in-class learning experiences. Three in-class observations were conducted for each of the four lecturers' classes to ascertain the attitudes of these lecturers and their students on the use of Notebooks in class. Each observation lasted the average time of a lecture, which is forty-five minutes.

The research participants were undergraduates and postgraduates from five departments: Information systems; Demography; Education; Health Economics; and Information and Library Studies. The courses in these departments were selected because lecturers made use of the learning management system (LMS) as a medium for distributing electronic resources and by extension some students accessed the resources in class using Notebooks (NB: Few students owned Notebooks).

### 6. FINDINGS AND DISCUSSION

Interview transcripts of both students and lecturers were analysed. Giddens' notions of structure, system and structuration provided the analytical framework. To this end, the objective of the analysis was to gain insight into the interplay of rule, resources, actors, social practices and conditions of reproduction. The goal was to move towards understanding the question of educators' ambivalence to students' use of Notebooks in class and the extent to which this was a condition of a lack of understanding of the benefits of ICTs for teaching and learning.

In the next section lecturers' and students' perceptions are analyzed. For the purposes of anonymity, lecturers are described as masculine with a he or his while students as feminine. These are not necessarily their true genders.

#### 6.1 Analysis of lecturers' views

The lecturers' perceptions ranged from selectively allowing use of Notebooks in specific topics in lectures (but not encouraging their use except for one lecturer interviewed), sceptical view instantiated by perceptions of Notebooks as having a detractive effect and feelings that Notebooks were unnecessary for some classes. The following are extracts of the responses from

lecturers when asked whether they allowed the use of Notebooks and whether they felt they could enhance meaningful learning for their students

L1: I have never thought about *how* and *why* Notebooks could be used in the lectures. What I know is that I have a student who is researching on how Notebooks are being used to improve the literacy (writing) skills for Grade 11 classes of a school in the Western Cape. Of course, this school has introduced the use of Notebooks in class because it is one of the posh schools around. But for a university, I have *never figured out how this could be applied*. Honestly, I have never thought *how* this could happen.

The lecturer seemed to acknowledge the value of Notebooks in literacy development skills, yet failed to locate the essence of Notebooks in university classes hence his indifference to their use. The fact that he mentioned he has never figured out *how* they could be appropriated could have two profound meanings. First, that it might be understandable that Notebook use as mediating tools for student learning of his course might be unnecessary or that the lecture space layout could preclude their use even if he wanted to introduce them. Alternatively, this could mean that he could not figure out the pedagogical implications of introducing their use. Aptly put, where Notebooks are introduced as tools of constructivist knowledge construction and dialogic interaction, there is far reaching re-engineering of pedagogical processes necessary— renegotiation of the instruction mode, redefinition of the role of the teacher and the emergence of *multiple voices* from students which could be unsettling/ disturbing to contemplate for the lecturer. Another lecturer when asked the same aforementioned question snidely remarked

L2: That would depend on what it was used for. I mean if it is used for the same purpose as a hand written, you know if it is used *to take notes like pencil; and papers*, then I *do not see how it is different and that is how it is used I think. I think it is just used to take notes...* I had a Notebook in England when I was a student and I never carried it, never. I didn't have any need to. Pen and paper to take notes, if I need to take notes. Some students don't need to take notes, they very solely take notes in lectures, very solely. *I would rather listen and engage* and if the guy covers something, I would ask them to send me their notes that's what I will do and I have trained my students to do that also so that they *would rather engage than take notes...* So I don't think that universities are going to crush if they do not have Notebooks in the classes. You see if you use a Notebook *as a notepad it is absolutely no different* than to use a pen and paper. So its kind of a false notion that you have that one is technologically advanced by using a Notebook. It's not. It's *absolutely no different* than to use a pen and paper, it's the same technology.

The lecturer's view on student Notebook use in class sounds a bit sceptical and he feels that Notebooks are only being used to replicate what a pen and paper does. While his view of some resounding consonance between the Notebooks and pen and paper as note taking and mnemonic devices could be logical, the same cannot be said if these devices (Notebooks) were Internet networked allowing for the online discursive engagement of students and quick online access to relevant learning material.

What the lecturer seemed not to realise is that Notebooks offer more affordances for collaborative engagement than pen and paper through the exchange/sending of typed text to group members and access to related academic material on the Internet to support established personal perspectives and ideological positions expressed in text. Diametrically different from the aforementioned remarks is another lecturer who gave an encouraging remark about Notebook use in his classes.

L3: *We allow* them to use Notebooks and there are *no restrictions* and they can use anything in the lab and in class. While some lecturers could have found them *distractive* but not with our department. We also allow them to SMS questions to Dynamic Frequently Asked Questions (DFAQ<sup>2</sup>) in class, any time—twenty four hours a day. If they have got a question and they think about it they can SMS right away. The reason for that is that they do not have to wait, they can SMS twenty-four hours a day.

In this class students were allowed to post questions to DFAQ, an anonymous consultative space [11][12][13][14] with a mobile phone interface. Using DFAQ students ask questions and get responses from peers or lecturer. These threaded interactions of posts of questions and responses, generated by students, become resources (artefacts) for future reference by students. The fact that students are allowed even during lectures (in class) to post questions is encouraging and sounds inconsistent with other lecturers who feel that such engagements could be disruptive to the flow of their lectures. One student when asked about her experience of classes particularly the use of Notebooks in class, she highlighted that Notebooks could only be used for specific topics but more often than not they were discouraged.

L4. Well, the lecturer didn't have the time, in fact it was perceived not convenient for us to work with Notebooks as he would be conducting his lecture since the *lectures were more of a one way process* where the lecturer would be giving information to students and as such using Notebooks was conceived *to obstruct the course of the lecturing process...* like he felt we would not be able to pay particular full attention when he would be there displaying be it a method or whatever, in front of us explaining. So for us to be working with Notebooks that was *actually discouraged* and we did not have the time to be working on our Notebooks.

The fact that the Notebook would split student attention and eye contact between the Notebook and the lecturer was identified in addition to constraints of time, as the reasons for viewing the Notebook as distractive. This shows the dilemma that lecturers often face in introducing Notebooks in class— the need to open up learning opportunities by appropriating the technological affordances of interactive engagement and developing open educational systems receptive to digital technologies on the one hand, and the need for smoothly flowing lectures occasioned by concentrating on the teacher as the main information disseminator (“the sage on the stage”). While lecturers were concerned about the need for innovative use of Notebooks in class, they seemed equally anxious about additional demands for surveillance that were prompted by what they perceived as off-task behaviour. One professor cited this:

<sup>2</sup> DFAQ is a special purpose anonymous consultative tool developed at UCT by one of the authors of this paper.

L5: You want my opinion whether I think it is useful for students to engage with Notebooks in class? My response would be influenced by *my understanding of what I thought* the students would be doing with those Notebooks. If they were taking notes or summarising notes, I would have no problems with that and *that would have to be apparent...and I know how distracting* a Notebook can be. If I felt the tool was helping to understand the learning material I wouldn't be unhappy with it at all... But I think *I need to know what they are doing with the Notebooks, what specific function or what value they were going to get from that Notebook. If it is to fiddle round and play notes and crosses and bridges, what's the other game that they play?* Some video games? Yaah, then I won't be interested.

What is very apparent in the Professor's utterance is not only the need to optimise the students' learning experiences with these interactive gadgets but also the tension and dilemma of the occasional need to retain the lecturer's *authoritative voice* in the class on the one hand, and the challenge of managing other perceivably flippant activities or off-task behaviours by students, on the other. The professor's legitimate right to retain the former is evident in his emphasis on the validity of his opinion as an authority figure- "*my understanding of what I thought* the students would be doing with those Notebooks...and *that would have to be apparent...* But I think *I need to know* what they are doing with the Notebooks, *what specific function or what value they were going to be getting from that Notebook.*" The complexity of sanctioning perceivably distractive engagements is evident in the latter statement: "*If it is to fiddle round and play notes and crosses and bridges, what's the other game that they play?* Some video games? Yaah, then I won't be interested."

The same professor also underlined that:

L6: If I need to *demonstrate and show something* a little bit complicated, I do not want them to be distracted with e-mails or looking at other things. You know, sometimes *they get behind and they start fiddling and fussing.* So I think distractions computers or Notebooks offer are many, opportunities for distractions like getting meddled up or losing your words or something happens or whatever, there can be a grand distraction... I would also not like the Notebooks to be a distraction to other students who don't have Notebooks. You know when people are working at a Notebook *they mutter under their breathe and they are doing all sorts of things* because technology is not always smooth. So if they were getting flustered, irritated or impatient *they would start muttering* or what ever, yaah.

The central place of the lecturer in the class is manifested in this transmission mode of pedagogy where he directs and controls the instruction and flow of interactions permissible, and the students' role is to follow and observe the demonstrations or examples.

**Table 2: Structuration Analysis of Lecturers' Interviews**

<p>STRUCTURE Rules and resources organised as properties of social systems. Structure only exists as</p>	<p>L1: Attribution of use of Notebooks to a well resourced school. Distinction between schools and universities; and the unspoken rule that literacy (writing) skills are what happens at schools and not universities.</p>
<p>SYSTEM Reproduced relations between actors or collectivities, organised as regular social practices.</p>	<p>L2: During lectures students listen and engage without note taking. L3: Students set rules of when and where they use ICTs. Provide resources 24/7 as learning cannot be confined to time or space. L4: Students are discouraged from using Notebooks to enable them to concentrate during a lecture which embodies resource investment in terms of educator's time to prepare. L5: The rule of use is that the educator ought to know that students are doing with the Notebook but seem unaware of how the device can be integrated for teaching and learning. Knows what students should not be doing and not what they should be doing.</p> <p>L1: Social practice is reproduced through operating within what is known. L2: Old experiences as a student are reproduced through expectations of students to do the same. L2: Universities will survive with or without technologies and ICTs are merely tools for doing what we do already. L3: Existing student social practices as evidenced outside the classroom are allowed to reproduce in class. L4: Reproduce notions of a lecture room as a space for one way communication from educator to learners. Interaction with learning resources, which Notebooks enable, is not seen as a lecture room activity. L5: Quest to maintain attention by removing distracters aims at reproducing relations of teacher-learner and not learner and learning. L6: Reproduce silence in class when a lecturer is explaining something important. Nothing is said about what should happen any other time.</p>
<p>STRUCTURATION Conditions governing the continuity or transformation of structures, and therefore the reproduction of systems</p>	<p>L1: Not to have thought about how and why suggest unconscious inclination to continuity of status of lectures. L2: A pre-determined use limited to familiar metaphor of pencil and paper thereby seeing normal practices continued in electronic form. L3: Transformation is fostered through support as educators use popular tools among students for teaching and learning. L4: Preconception of a lecture as a place where one person (usually a lecturer) speaks and the rest of the class is "quiet" and Notebook use seen</p>

	<p>to distort this culture.</p> <p>L5: Condition is governed by pre-understanding of possible uses and only the known uses are reproduced.</p> <p>L6: Users of Notebooks mutter things when using them. Unsure whether such muttering shapes learning or is a sign of reflection but importantly stopping usage will reproduce the status quo.</p>
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## 6.2 Analysis of students' views

Students interviewed echoed the need to change the teaching mode/ strategy where Notebooks are used for collaborative student learning, problem solving and engagement with learning resources. One student coined the need for proper time management and for lecturers to wander around the class to keep students focused on the task, if necessary:

S1: When a lecturer adopts the methodology of using Notebooks as part of his teaching strategies he needs to be careful in terms of *time management*. He needs to ensure that instead of him standing in front of the class he has to be going right round the students monitoring and seeing how they are trying to follow what he is teaching. Where possible, students should make the corrections necessary there and there so that they do not spend a lot of time trying to solve one problem. So the *interaction must be more intensified* when using Notebooks than when they are doing that one-way lecture system.

The welcoming ambience of students consciously attending to a guest lecture while subconsciously/ unconsciously browsing the Internet (for important literature related to that lecture, global affiliations that can leverage their context specific real-life learning experiences on specific lecture topic and instant messaging of students' reflections of their lecture experiences to peers) could expose exciting opportunities students are dearly missing by silently listening to the lecturer in class. Not only does this academic set up provide insights on the implications of reduced teacher authority as the predominant "authoritative voice" [1] and information hub, but instantiates some rethinking about how innovative pedagogy could be activated in a reconfigured classroom set up involving multiple technology enabled voices.

Despite the popular notion of student empowerment, lecturers also seem to be concerned about student social power and thus there is tension between class discipline and empowerment. When these researchers suggested to one lecturer that Notebooks could be used to access extra online educational material for a writing (literacy) project in class, he retorted:

S2: While the lecturer is lecturing? Show me a lecturer who could be keen to lecture to someone who is not listening, is searching for material. Searching for material while I am lecturing? No! No! No! Maybe it may have to be outside. So when you are talking about technology, you are also envisaging a different manner of transmission...

Similarly, the other Professor also noted:

I do not think it is especially useful to say should Notebooks be used in a classroom? There might be instances where lecturers would say No, it's not

necessary. I am *demonstrating things* on the board and I don't need a Notebook, they can just need a pencil and paper to do a mathematical formula. They do not need a Notebook for that. So I think it depends very much on the activity or the task.

It seems this transmission mode has also been internalised by students as they are being taught using this style and their conceptualisation of the lecture legitimises the lecturers' authoritative voice. Appropriating the lecturer's voice one post graduate student said:

S3: ...Notebooks do not have an actual use in that learning process. Because I do not see the use of a Notebook when I *am telling you* something. I have come here *to tell* you A, B, C, D, *you would not need* a Notebook to hear that. You would *only need your ears*. You would *just listen* and maybe I have a handout on that so I would give you a handout for that...

Yet another student doing a statistics based programme (which can not be mentioned for the purpose of anonymity) expressed the importance of Notebooks for student practice in class as the lecturers demonstrate on the board so that their mistakes can be apprehended instantly by the teacher. The student noted:

S4: From my own point of view, the most convenient way would be for us to be using Notebooks in class *as we are learning* about something- be it a method or a certain technique. For us in (Degree programme mentioned), as we are learning that technique the convenient way would be *putting it into practice as he will be teaching us*. We have to implement that *in practice*. But now if he *postpones* (that is by allowing them to practice in the laboratory after the lecture), it actually *creates some problems* and *we won't be able to comprehend*. So for me, the most convenient way would be to use the Notebooks in class so that we would learn from that practically. He could be giving examples and we could be typing on our Notebooks instead of lecturing separately and then we go to the labs and try that out. That *postponement* actually *creates loopholes* in the learning process. The convenient way would be to make the lectures *more practical*... Basically it goes back to the point that lecturing should be a *two way process* whereby the lecturer teaches, we face a problem and we tell him *there and there and we get feedback*. So that two-way process is the most convenient way of learning.

The most disturbing issue is to reduce the complex process of meaningful learning to consumption / acquisition (the first student's observation). What seems apparent is the ambivalent position with regards the loci and foci of student voice in an interactive learning environment enabled by digital technologies. Lecturers appear to reinforce one way instructive process that could be potentially disempowering on the students' part as the latter student complains.

**Table 3: Structuration Analysis of Student Interviews**

<p>STRUCTURE</p> <p>Rules and resources organised as properties of social systems. Structure only exists as 'structural properties'</p>	<p>S1: i) Students need supervision to stay focused on a task and lecture time would be lost if such supervision was undertaken in class as students use Notebooks.</p> <p>ii) Completion of syllabus and heavy workload is shown as a sign of</p>
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	<p>progress in learning and use of Notebooks is needed to contribute to this.</p> <p>S2: Students to listen and not do anything else during a lecture. Looking up electronic resources during class causes unnecessarily disruption and has no place in class.</p> <p>S3: i) Teacher initiated resources are more valuable than those from student /their peers / technology mediated. ii) Notebooks are not associated with 'hearing' or recording of a lecture through it.</p> <p>S4: The gulf between practice and theory must be closed.</p>
<p>SYSTEM</p> <p>Reproduced relations between actors or collectivities, organised as regular social practices</p>	<p>S1: Create a more interactive learning environment rather than the traditional one-way communication.</p> <p>S2: Reproduce superordinate-subordinate relations by restricting in -class online access to resources.</p> <p>S3: Continue to use ears to hear and there is no need for technology mediation.</p> <p>S4: Teaching should be a two way communication between a teacher and students, students and resources, and use of Notebooks will allow this to happen.</p>
<p>STRUCTURATION</p> <p>Conditions governing the continuity or transformation of structures, and therefore the reproduction of systems</p>	<p>S1: i) Change the way lecture time is managed. ii) Foster continuity of lecturer' role as a controller of learning processes and not as a 'guide on the side' of a learner.</p> <p>S2: Do not see how searching for material during a lecture could be related to a current lecture.</p> <p>S3: Classes are places to hear and there is no place for technology there.</p> <p>S4: Use of devices will make lectures more practical and more convenient for students.</p>

## 7. CONCLUSION

This paper has discussed the extent to which educators' ambivalence to student use of Notebooks could be attributed to lack of understanding of the benefits of ICTs for teaching and learning. While some limited resources and configuration of lecture space were identified by lecturers as standing in the way of technology mediated interactive teaching and learning, the challenges and tensions of retaining the authoritative voice of these educators in class frequently surfaced as one of the reasons for their uneasiness about students' use of Notebooks during lectures. Giddens' [2] Structuration theory was used to show how some of these lecturers' old experiences are often reproduced when they expect their students to act in the same way as they did in class like seating in silence, observing,

handwriting notes or not taking notes at all. As an increasing amount of learning resources are distributed to students electronically, Notebooks mediate access to and engagement with learning resources anywhere anytime. Notebooks are increasingly replacing the traditional student backpacks. Our conclusion is that educators' ambivalence to students' use of Notebooks in class is a condition of misunderstanding the implications of electronic distribution of resources and electronic tools at students' disposal to access, read and annotate the resources. Embodied in such condition of understanding is the need for pedagogical knowledge of Notebooks. The educators' ambivalence to students' use of Notebooks in class need not therefore be a barrier to successful implementation of an educational technology policy.

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