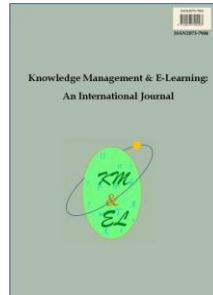


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# **Knowledge Management & E-Learning**

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## **What makes lecturers in higher education use emerging technologies in their teaching?**

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## **What makes lecturers in higher education use emerging technologies in their teaching?**

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**Abstract:** What makes lecturers in higher education use emerging technologies in their teaching? From the literature we know that lecturers make use of teaching and learning technologies in response to top-down initiatives, and that some also initiate bottom-up experiments with their own teaching practice, driven by both pragmatic and pedagogical concerns. This study is particularly interested in what motivates lecturers to try emerging technologies – those teaching and learning technologies that are new, or are used in new ways, or in new contexts to change teaching practices. This paper analyses the responses of university lecturers in South Africa, who use emerging technologies in their teaching, to a national survey which asked what motivates their practice. The rationales that lecturers use to explain their practices include a mix of pedagogic concerns, pragmatism and external imperatives. These rationales speak to common higher education discourses: effective learning, the welfare of students, and oversight and control; efficiency in the face of the conditions of higher education; as well as the external “imperatives” of the knowledge economy and labour market. Alongside these a discourse of empowerment emerged, including resourcefulness in under-resourced contexts, and creative individual responses to higher education challenges. Such discourses seem to imply that lecturers who engage with emerging technologies are asserting themselves creatively and claiming a more positive positioning in the challenging landscape of modern higher education.

**Keywords:** Adoption; Emerging technologies; Innovation; Higher education; South Africa

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## 1. Introduction

Emerging technologies in higher education teaching and learning are new technologies, or technologies that are being used in new ways or in new contexts to change teaching practices. What makes university lecturers innovate in these ways? Much of the research into why lecturers make use of learning technologies in higher education is undertaken from the perspective of the institution – asking what makes lecturers use technologies provided by the institution or what institutional conditions, including reward structures, would support or hinder adoption (Machado, 2007; MacKeogh & Fox, 2009; Mufeti, Mbale, & Suresh, 2008; Schneckenberg, 2010, Stensaker, Maassen, Borgan, Oftebro, & Karseth, 2006; van der Merwe & Mouton, 2005).

This paper is instead concerned with the perspective of the academic innovator who pushes the boundaries by exploring new or unusual technologies, or uses technologies in new ways, or introduces technologies into contexts where they have not been used before. What motivates these people? Why are they willing to put in time and energy to experiment and make changes to their teaching practice? This paper looks at what university lecturers in South Africa, who use emerging technologies, say about why they do this.

## 2. Emerging technologies and the South African emerging technologies project

The term “emerging technologies” is defined in the annual Horizon Reports (Johnson et al., 2008, 2009, 2010, 2011) in terms of the impact that the technologies are likely to have “on teaching, learning, or creative inquiry on college and university campuses within the next five years” (Johnson et al., 2011, p. 3). Other reports, instead of defining the term, list the characteristics or affordances of emerging technologies. For example Bryant (2007) identifies communicating and connecting, collaborating and co-creating, using visual and audio materials as well as text, and blending real and virtual worlds as characteristics of technologies that students are engaged with. Siemens and Tittenberger (2009) list affordances of emerging technologies which include accessing resources, declaring physical or virtual presence, expression, constant interaction and aggregation of information and relationships (p. 42). A shift in the locus of control away from the institution and towards individual lecturers and students has also been identified as characteristic of emerging technologies (Oblinger, 2008; Committee of Inquiry into the Changing Learner Experience, 2009).

The first significant attempt to define emerging technologies was made in 2010 by Veletsianos after observing the lack of a coherent definition among researchers in the area. He defined emerging technologies in education as “tools, concepts, innovations, and advancements utilized in diverse educational settings (including distance, face-to-face, and hybrid forms of education) to serve varied education-related purposes (e.g., instructional, social, and organizational goals)” (Veletsianos, 2010, pp. 12-13). He went on to describe five characteristics of emerging technologies: (1) they are not necessarily new; (2) they are evolving; (3) they go through hype cycles; (4) they are not yet fully understood and not yet maturely researched and (5) they have the (often unrealised) potential to disrupt (Veletsianos, 2010, pp. 13-17).

In South Africa, the members of a research team working on a national emerging technologies research project grappled to find a common understanding of emerging technologies in the South African higher education context (Gachago et al., 2013). The

team identified a number of different institutional and disciplinary contexts that might lead to different technologies and practices being considered emerging. For example, on a campus where there is no learning management system, implementing Moodle to deliver learning materials to students might be considered an emerging technology. The team concluded that Veletsianos' definition was able to take account of the contextual complexities in higher education in South Africa and identified two additional characteristics of emerging technologies: that they were used by particular people and that they were empowering for students and lecturers (Gachago et al., 2013).

Working from these definitions, for the purpose of this paper, I view emerging technologies as technologies and practices surrounding their use in higher education to serve education-related purposes where the following characteristics are evident. (1) These technologies are new to a specific context or are being used in a new way. (2) The technologies and the ways in which they are used are evolving; they are not well-established. (3) The use of emerging technologies mirrors established "hype cycles" of inflated expectations and disillusionment, followed by either more realistic adoption or abandonment. (4) Emerging technologies are not yet fully understood or maturely researched within the particular context. (5) Emerging technologies have the potential to transform higher education teaching practices and learning experiences and outcomes. (6) Emerging technologies create shifts in the locus of control or the balances of power within higher education. The matter of the type of people who use such technologies is what I wanted to investigate, and so I omit the sixth of the characteristics identified by Gachago et al. (2013).

### **3. What do we know about why lecturers use technologies in their teaching?**

We know that the adoption of information and communication technologies (ICTs) in university teaching and learning is driven both by top-down strategies, where national bodies or institutions seek to increase the use of technologies in teaching and learning, and by bottom-up experiments of individual lecturers, or groups of lecturers (White, 2007; Moll, Adam, Backhouse, & Mhlanga, 2007). The top-down approaches are sometimes supported by national policies and programmes, such as quality assurance in the UK (White, 2007) or the infrastructure, training and standards-setting programmes around e-learning in China (Zhou & Xie, 2009), and sometimes by institutional policies, infrastructure and support mechanisms (Czerniewicz, Ravjee, & Mlitwa, 2007; Moll, Adam, Backhouse, & Mhlanga, 2007; Stensaker et al., 2006; van der Merwe & Mouton, 2005; White, 2007). The extent to which technologies are used in a university has also been linked to the nature of the institution, its organisational culture and the level of resources it has (Czerniewicz & Brown, 2005; Moll, Adam, Backhouse, & Mhlanga, 2007; White, 2007). In South Africa, the socio-economic and political contexts of the institution have been found to play a role (Czerniewicz & Brown, 2005).

White's (2007) study of higher education e-learning in the United Kingdom found that more financially autonomous institutions were likely to have good, but localised, "bottom-up" implementations of teaching and learning technologies. Such implementations were also observed in South Africa with individuals or small groups experimenting with technologies to address particular pedagogic concerns (Moll, Adam, Backhouse, & Mhlanga, 2007). Whereas top-down institutional implementations involve well-established and understood technologies, small-scale bottom-up initiatives are more likely to involve emerging technologies. White found that lecturers who initiate these

projects are motivated by pragmatic reasons, or by the desire to improve teaching and learning, sometimes in the form of research into teaching practice.

Research into why lecturers use technologies in their teaching often focuses on lecturer uptake (or lack of uptake) of technologies provided by the institution (Machado, 2007; MacKeogh & Fox, 2009; Mufeti, Mbale, & Suresh, 2008; van der Merwe & Mouton, 2005), or on the institutional conditions, including reward structures, that support or hinder adoption (Schneckenberg, 2010, Stensaker et al., 2006; van der Merwe & Mouton, 2005). From these studies we know that lecturers' attitudes towards these technologies, willingness to risk new forms of teaching, and skills in using technology are key factors in their engaging with teaching and learning technologies. Barriers to adoption include unsuitable facilities (Brill & Galloway, 2007; Chitanana, Makaza, & Madzima, 2008) and a lack of skills, or time to develop skills and prepare new materials (Chitanana, Makaza, & Madzima, 2008; Stensaker et al., 2006; van der Merwe & Mouton, 2005) as well as a lack of pedagogical knowledge (McPherson & Nunes, 2008; Ng'ambi, Bozalek, & Gachago, 2013). Research has also found that university lecturers generally have positive expectations of using ICTs in teaching and learning (Brill & Galloway, 2007) and, when they do make use of them, they are motivated by pedagogic concerns and not by extrinsic rewards (van der Merwe & Mouton, 2005).

This research looks more broadly at why lecturers use emerging technologies, and includes those who opted to make use of technologies provided by institutions as well as at those who took the initiative in using other technologies to enhance their teaching practice. The goal was to see whether motivations differed from earlier studies that had a more institutional focus.

#### **4. The emerging technologies survey**

This research is part of a three-year project on emerging technologies, investigating the educational outcomes and transformations of higher education teaching and learning that can be realised through the use of emerging technologies. The project was initiated in 2011 and involves 18 researchers based at 8 South African universities and one international non-governmental organisation (NGO). The emerging technologies project included a national survey of lecturers at South African universities as well as in-depth case studies of some of their practices. This paper focuses on one aspect of the larger research project – the rationales and motives for using emerging technologies – as revealed in the responses to the national survey.

The emerging technologies survey was conducted among lecturers at South African higher education institutions during August and September 2011. Purposive sampling was used to get responses from lecturers who were using emerging technologies in their teaching. The survey was distributed electronically to individuals identified by members of the project team, or by appropriate institutional representatives, as using emerging technologies and respondents were asked to forward the survey link to others in their networks who were similarly engaged.

A total of 262 responses were received and they included academic staff at 22 of the 23 public universities in South Africa. Most of the respondents (46 percent) identified their knowledge field as the professions and applied sciences, with fewer from the social sciences (11 percent), formal sciences (9 percent), humanities (9 percent) and the natural sciences (7 percent). The remainder did not identify a knowledge field. The majority were appointed at more junior levels: 34 percent lecturers, 20 percent senior lecturers, 10

percent associate lecturers. Only 7 percent of respondents were professors and 8 percent associate professors. The remainder were not in academic positions.

A list of 33 technologies was presented in the survey, based on emerging technologies mentioned in the Horizon Reports (Johnson et al., 2008, 2009, 2010, 2011), and the research team's experience. The list included technologies such as instant messaging, blogging, wikis, open educational resources, screen-casting, personal response systems, electronic portfolios and augmented reality. The complete list is reported in Gachago et al. (2013). Although the research team could not be certain that respondents shared our understanding of emerging technologies, their choosing to participate indicates that they considered their own use of technologies to be emerging.

The survey investigated the rationales and motives for using emerging technologies, by asking for a textual response to the question: "Please explain the rationale or motivation for engaging with this particular teaching and learning practice. What prompted you to initiate or use this practice?" This paper analyses the 150 responses to this particular question. Responses were an average of about 100 words in length, with some running to 500 or 600 words. The responses were coded according to their content, with brief descriptors. This process was continued until all parts of every response were coded, some with multiple descriptors. The list of descriptors was then scrutinised for overlaps and some were combined. For example, the descriptors "accommodating different learning styles" and "accommodating different students" were combined. The coding was then reviewed by an independent researcher to check for other possible interpretations of the responses, and refined. In all, 352 occurrences of a final 39 descriptors were noted. In the discussion below, counts of the frequency with which descriptors arose in the data are used as an indication of which categories of responses were most prevalent.

In interpreting what lecturers say about why they use emerging technologies, I distinguish between motivation and rationale. Motivation is what makes someone expend time and energy on a task (Cooper & Jayatilaka, 2006), while a rationale is "a set of reasons or a logical basis for a course of action or belief" (Rationale, n.d.). While motivation results from intrinsic or extrinsic rewards, or from social obligations (Cooper & Jayatilaka, 2006), rationales are the reasons that individuals construct to explain their actions to the world, and to themselves. Rationales need to be rational, or reasoned, and so they make use of the discourses that surround an activity to construct a logical or defensible account of their decision. Consequently, such accounts "reflect culturally embedded normative explanations" (Orbuch, 2007, p. 460).

The data that this paper reflects on included both motives and rationales, with the rationales providing useful insights on how lecturers understand and respond to prevalent higher education discourses.

## **5. Pedagogic concerns: "my passion – student support"**

Lecturers who use emerging technologies are primarily concerned with improving their teaching practice and their students' learning. This reflects the findings of prior research as discussed above. Eighteen of the 39 descriptors related to pedagogic concerns and 53 percent of the coded data was linked to these descriptors. The descriptors, examples of responses, and the frequency with which the descriptors occurred are given in Table 1.

**Table 1**  
Pedagogic reasons to use emerging technologies

Descriptor	Examples	Frequency
To promote social or collaborative learning	“The use of chats and creating of group assignments encourage collaborative learning”	25
To engage students more	“getting students to engage more meaningfully with the ideas”	20
To facilitate new or different ways to teach	“It offers an opportunity to blend traditional class-based teaching and learning with real-time teaching and learning that is not limited by space and a physical place.”	20
Better or different learning materials	“I discovered that students are recording lectures on their cellphones. I wanted to support them since they obviously have a need for such material.”	18
Better learning experience	“We were looking for ways of increasing a sense of community among the students and so that they don't feel isolated when working on their assignments on their own.”	16
Better or different learning outcomes	“The use of the Wiki enabled some of them to make the link between a theoretical concept and application.”	16
New or improved assessment practices	“New approach makes effective marking of assignments possible and practical feedback times can be achieved.”	10
To develop practical skills	“I needed a more effective way of developing competencies, which required students to actually apply the referencing principles and practice the referencing skills.”	10
Accommodating different students (differentiation)	“It provided versatility to meet different learning styles.”	8
To facilitate personalised learning (personalisation)	“All students could learn at their own pace.”	7
To promote more active learning	“Students' inability to understand calculations on a PowerPoint presentation, but they are involved when calculations are done with a tablet.”	7
Monitoring students	“It's also an indirect way of monitoring attendance, and the act of monitoring improves attendance.”	6
To promote real-world learning	“It gives the student a real world working experience; gives students exposure to tools he will use in his career”	6
To aid understanding of complex concept	“I chose to use concept mapping to model the links between cardiovascular hemodynamics because students find it difficult to make these connections.”	5
Motivate students	“My intention is to enhance motivation to learn.”	5
To access experts	“Due to the lack of a deaf person lecturing the subject I wanted to expose students to a natural signer.”	3
Supports traditional teaching methods	“Allows both sharing of programmes / documents as well as 'classical' classroom teaching using a whiteboard.”	3

Lecturers used emerging technologies to change or improve their teaching. Many said that they were trying to increase social or collaborative learning. For example, a lecturer in health sciences used Google groups to encourage communication “between

students themselves; encouraging them to share experiences to prompt learning”. Several expressed an interest in making learning more active. A chemistry lecturer who felt that “students sit inactively in class and wait for information to flow naturally into their brains without them taking part or providing any effort of their own” had made use of cell phones as a student response system and was able to incorporate student feedback and questions into lectures. Lecturers also used emerging technologies to simulate “real-world” experiences. For example, “Physioex simulated physiology labs allows students to experience laboratory experiments without the need for in depth experimental knowledge or equipment”.

Some pointed out that these technologies facilitated ways of learning not supported by traditional university teaching practices. For example, students can be made to engage more actively with the subject matter:

*“Taking the student out of the comfort of the textbook-solved problem ... through a step by step discussion toward final solutions and offering an opportunity to question fundamentals as they build their own solutions from scratch.”*

Technology also facilitates engagement with the lecturer and with each other, as this respondent explains:

*“I used Elluminate to show its superiority to expensive conferencing systems, as well as to show how interactivity is possible, adding synchronous real time meaning construction to traditional forms of asynchronous delivery (discussions, quizzes, assignments etc.)”*

Use of emerging technologies can also change the interpersonal dynamics. A lecturer in health sciences who made students “collaborate to create a Wiki on a specific topic as a class assignment” said that “the design of the assignment allowed for all the students to participate without individuals with stronger/weaker group-personas to be marginalised”.

Emerging technologies were used to provide “good quality learning materials” and innovative learning materials. One lecturer started making podcasts, vodcasts and video lectures because “the PowerPoint slides ... only gave students an overview of the concepts ... students had no way to refer back to the in-class demonstrations.” Videos, animations, simulations and other interactive software were used to explain complex concepts ranging from molecular processes to computer programming. While these concepts can be explained using more conventional methods, the respondents chose to use technologically sophisticated tools and felt that these could enhance their explanations.

Lecturers used emerging technologies to increase the range of learning materials available. They provided learning materials that were more accessible because they were visual, such as practical methods and techniques in art, or locally relevant; “European texts are ... not accessible to our students”. They could also provide access to external experts to contribute to students’ learning, such as exposing students learning sign language to a native signer.

Emerging technologies provided improved ways to assess learning and more effective means of monitoring students’ progress. Many commented on the ease of giving feedback quickly to students and they said that technology “allows for quick testing of students’ understanding, not the least for formative purposes”. Lecturers were able to provide more meaningful assessment, directly related to intended outcomes:



*“I wanted students to develop a digital portfolio where they could show evidence against criteria and exit level outcomes and I wanted them to be able to reflect on their practices and receive feedback in doing so.”*

Lecturers used emerging technologies to monitor progress; one said that chat rooms were “a very good indication of struggling students”. Technologies helped to monitor and influence behaviour; one lecturer said that clickers were “an indirect way of monitoring attendance and the act of monitoring improves attendance”.

Respondents reported that emerging technologies resulted in better learning outcomes, including higher quality work and more relevant or practical skills. A lecturer in fine arts who made electronic examples of cartooning techniques available to her students reported that “the resulting student cartoons were so much more consistent and impressive”. Two people who taught programmes in education referred to the technology skills that future teachers were developing that they would be able to apply in their teaching. There were benefits to the teaching outcomes, even when resources were limited, as this lecturer reported:

*“Because there are only 25 clickers available at the University, students had to share a clicker in groups of two or three. This also exercised their argumentative skills because if they disagreed they had to convince one another to finalise their vote.”*

In this case the use of clickers had the unanticipated effect of improving language skills, which has been identified as a barrier to the adoption of e-learning (Qureshi, Khloa, Yasmin, & Whitty, 2012).

While this study relied only on lecturers’ perceptions of improved outcomes, this is in line with previous studies that have measured such improvements (Aghili et al., 2012; Simelane & Skhosana, 2012).

Others expressed concern for the students’ learning experience; they were looking for ways to make students feel less isolated. Lecturers also spoke about how technology allowed them to differentiate their teaching; for example, to accommodate different learning styles; or how it allowed students to personalise their learning, for example by allowing students flexibility about when and how they learned (Bray & McClaskey, 2013). Several of them reported that emerging technologies were effective tools to motivate and engage students, saying that “the opportunity to use ICT introduces a palpable sense of enthusiasm amongst the students”.

The discourses that underpin the pedagogic rationales are those of effective learning and the welfare of students. The teaching practice of lecturers engaged with emerging technologies is concerned with students’ experience, and is informed by their understandings of learning which include common discourses of personalised learning, social and collaborative learning and of skills development.

I was interested in whether particular learning theories underpinned teaching practices using emerging technologies. Some responses made explicit reference to theories of learning including cultural historical activity theory, situated learning, social constructivism and multiple intelligences. Others referred to the more general concepts of active learning, “real-world” learning and collaborative or social learning. Responses that emphasised the use of technologies to better explain or illustrate concepts seemed to imply a cognitivist perspective. Lecturers who use emerging technologies seemed to embrace a wide range of learning theories, but the survey proved inadequate to accurately identify individual assumptions about learning and teaching.

Underlying the pedagogic issues that were raised, there was a strong sense, in many of the responses, that emerging technologies provided expression to the passionate engagement of lecturers with their teaching practice. They responded at length, but in half formed sentences, ideas running breathlessly into each other. It seems that many lecturers, who use emerging technologies do so as an extension of their passion for teaching.

## 6. Pragmatism: to “simply make our lives much easier”

Many lecturers in this survey make use of emerging technologies because they see obvious or direct practical benefits. Nine of the 39 descriptors related to practical reasons and they occurred in 28 percent of the data. The descriptors, examples of responses, and the frequency with which they occurred are given in Table 2.

**Table 2**  
Pragmatic reasons to use emerging technologies

Descriptor	Example	Frequency
To make learning materials available	“This allows learners to review content after official lecture times at their own pace.”	19
Efficiency	“Help demonstrators and tutors to mark electronic assignments more efficiently”	14
Cost savings	“It was the most cost-effective, least intrusive way of dealing with things”	12
To communicate with students at a distance	“My students are scattered all over the place and to keep in contact with them is a mission”	12
The technology was there	“All of them have cellphones: we decided to use the mobile interface”	11
Convenience or useful tools	“It made sense to use a tool that was user friendly and would save time”	11
Compensate for lack of facilities	“There are insufficient hands-on training venues on campus”	8
Working with large classes	“Large class numbers and also being able to respond to everyone in one go.”	7
Ease of administration	“Not such a lot of paperwork anymore”	6

Lecturers said that these approaches “just made sense”. They make use of emerging technologies for their own convenience; “ease of use – additions or corrections – allows reproducibility year after year” and “using the iPhone/iPad instead of a laptop allows me a lighter load to carry to lecture venues which may be far away from my office”. They also use them because they are available; “students... have ready access to mobile phones”, and to save time:

*“... all the non-formal ‘lectures’ given to groups of students after lectures – I saw no reason to repeat myself 5 times, and noticed that the students accessed the podcasts whether they had been present during the original meeting or not.”*

Other reasons put forward were financial, “cost – travel is expensive”; and to lessen the burden of administrative work, as this submission reflects:

*“...with large numbers of students, the use of Blackboard facilitates certain processes (e.g. class tests in the form of quizzes, control over assignment*

*submission, plagiarism checking, etc.) which are normally time consuming to do manually. ... Bulk SMS: students are not always on campus and sometimes it is necessary to send them urgent messages, for example if a part-time class has to be cancelled or postponed, if their marks have been published and they need to access it online, etc.”*

Some of the pragmatic reasons related to the teaching programmes and to the specific circumstances of students. Emerging technologies were used to distribute learning materials to students; to facilitate communication with students; or to make it practical to work with large classes. Some examples of such responses include, “our students are geographically very distant and we only meet face-to-face three times a year at our ‘Doc weeks’”, and:

*“This student body includes part-time students, some of whom are distance users of the Library. Face to face teaching is not always possible, especially after hours. .... Our Librarians are faced with very large classes which requires scheduling multiple repeat training sessions for smaller groups ... it became important for us to find a very flexible means of ensuring that students may avail themselves of learning materials – often short videos that coach them – on how to access, evaluate and use information resources to fulfil their learning tasks.”*

Past research found that a lack of facilities was a barrier to the use of learning technologies, particularly in developing countries (Brill & Galloway, 2007; Chitanana, Makaza, & Madzima, 2008; Qureshi, Khloa, Yasmin, & Whitty, 2012; van der Merwe & Mouton, 2005) but, interestingly, several responses to this survey indicated that emerging technologies were being used to compensate for such deficiencies. Respondents said that the lack of books, computers, or appropriate venues led to their engagement with emerging technologies. For example, one person sought electronic course materials because “we did not have sufficient books in the library for all students to access the necessary material” and another made use of a remote classroom because “the lecture hall could only accommodate 88 students and some groups had more than 88 students assigned to them”. Another response was that:

*“I am working at a university where there is very limited funding, shortage of equipment and almost no communication channels... I had to become innovative and create my own platforms and situations in which I could teach effectively, my students could learn effectively and where we could be in communication all the time. This platform was born out of frustration!!!”*

The pragmatic rationales articulate discourses of common sense and efficiency, in response to changes in higher education such as larger classes and distance provision. They also engage with discourses – particularly common in the African context – of lack and scarcity; universities have limited resources and need to do more with less. However, there were also discourses of individual resourcefulness and creativity in addressing problems and constraints. Such discourses include a sense of empowerment of academic staff which is often lacking in the higher education sector.

## **7. Imperatives: “pressure on academics”**

On a much smaller scale (13 percent of responses), the third category of descriptors indicated that lecturers were in some sense “forced” into adopting emerging technologies: they either had no choice, or they faced pressures that were difficult to resist. The

descriptors, examples of responses, and the frequency with which they occurred are given in Table 3.

**Table 3**  
Imperatives to use emerging technologies

<b>Descriptor</b>	<b>Examples</b>	<b>Frequency</b>
Students demand it	“Students relate: if you cannot beat them or ban them embrace and incorporate them, everyone relaxes.”	10
Best practice	“Current best practices in Physics Education making use of these tools.”	7
Technology Imperative	“The rationale for the use of the AD instrument systems came from a need to replace out-dated technology in teaching labs that could no longer be adequately maintained.”	7
This profession or career path requires it	“The Chartered Accounting profession in SA has recently produced a competency framework which focuses on competencies throughout the subjects rather than specific course content.”	6
The university, faculty or department said so	“We have been strongly encouraged to make use of it.”	5
The global knowledge economy requires it	“To equip students with appropriate knowledge and skills to meet the challenges of a labour market in an increasingly globalising world”	4
Reputational reasons	“We also wanted to be a trend setter in South Africa and we were the first university to make a whole-hearted move to equip undergraduate labs with this system - this allowed us to become an African reference centre and raise our profile within Africa.”	4
The nature of the course requires it	“The nature of the courses that I teach demands experimentation with new media tools for purposes of understanding user behaviours and also the relation and influence of these tools on professional media practice.”	3

In some courses, for example in computer science, media studies or education, the nature of the course demands that students engage with emerging technologies because they are learning about such technologies. More frequently, lecturers reported that students put pressure on academics to make use of technologies. For example one person said that “postgraduate students are requesting blended teaching and reduced face to face teaching”.

Some lecturers said that their institution, faculty or department “put pressure on academics” or “strongly encouraged” the use of technology. In some cases this was driven by concerns for reputation or the “good image” of the university, or by a belief that such approaches were “best practice”. Some of the pressure related to the expectations employers had of graduates. Either there were explicit expectations by professional bodies or employers, or more vague assertions, such as that students needed “appropriate knowledge and skills to meet the challenges of a labour market in an

increasingly globalising world". Finally, some had responded to technology imperatives, such as having to adapt because technology had to be upgraded.

These responses reflect common higher education discourses of globalisation, the knowledge economy and the labour market (Collis, 2005; de Boer et al., 2002) which are often cited as "imperatives" that drive higher education practice. However, they are not the dominant discourses, indicating perhaps that the lecturers who are engaged in using emerging technologies generally have more of a sense of their own empowerment and are less driven by external demands.

## **8. Other reasons**

There were four descriptors that did not fit the three categories above. Some lecturers cited personal interest in technology as their reason for using emerging technologies (6 occurrences); for others, attending a training course triggered a change in their practice (5 occurrences). Some were motivated to reduce the use of printed material or travel out of concern for the environment (4 occurrences); while a few were undertaking research into their teaching practice (3 occurrences).

## **9. Conclusion**

This survey of lecturers in South African universities who are using emerging technologies in their teaching and learning practice has confirmed what other studies have found: they are motivated primarily by pedagogic concerns. Their rationales are informed by pedagogic discourses of effective learning, social and collaborative learning, student-centeredness and skills development. To a lesser extent, lecturers are motivated by pragmatism, informed by discourses of common sense and efficiency, or of scarcity and limited resources. In lecturers' responses, the ideas of higher education responding to globalisation, the knowledge economy, and the labour markets are present, but not prevalent.

What this study has revealed is that emerging technologies provide an avenue for those who are passionate about teaching to creatively explore new ways to teach more effectively. It may well be that this passion is what drives lecturers to invest time and energy in learning about new technologies, and that creativity is an essential element in being able to see the possibilities inherent in emerging technologies. Even those who embraced emerging technologies for more pragmatic reasons invoked a discourse of resourcefulness and inventiveness, of "making do" with what is at hand. It would appear that constrained resources, far from being a limitation in the use of technology for teaching, can actually encourage it as a means to address the lack of resources in creative ways.

For some early adopters, emerging technologies provide opportunities for creative responses to the challenges of modern higher education, and engender a sense of empowerment in the face of these challenges.

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