

“SHOULD WE TEACH UNDERGRADUATE STUDENTS ELECTRONICALLY?” A SOUTH AFRICAN PERSPECTIVE

by
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ABSTRACT

Although there is general agreement that the introduction of new information and communication technologies, and specifically the move towards distance education and open learning, will be fundamental to the learning environment in future, the author is convinced that these offerings are not suitable for undergraduate education, and will not be able to eliminate, replicate or be equal in any way to traditional residential programmes, particularly in South Africa. It is the lifelong learning requirements and expectations among more mature students and adults that are supposed to drive the expansion of distance learning, not undergraduate education. The rationale for this argument should be viewed against the background that most undergraduate students, but specifically the non-traditional students in South Africa, due to various socio-cultural and political reasons, do not possess the required skills, knowledge, competencies and motivation to function effectively within this new technology enriched learning environment.

INTRODUCTION

The introduction of new information technologies, such as the Internet, particularly the World Wide Web, Internet-based teleconferencing, satellite videoconferencing, and interactive multimedia, to name but a few, seems to be perceived by many as the long awaited solution for the many diverse challenges and pressures to be met by institutions in the 21st century. These technologies will be fundamental to the learning environment in future, and will have a profound impact on the way we acquire, communicate, deliver and control information (McSeveney 2000: 4), that is, the way we teach and learn (Corraine 2000: 50). Evidence of this impact on the structure of higher education already exists (Green & Hayward 1997: 15), as more and more universities, globally, but also in South Africa, re-invent themselves as technological institutions offering “virtual” courses and degrees for different sectors of the educational world. It must also be noted that a significant proportion of these offerings are provided not by traditional academic institutions but by online profit-making enterprises.

For some commentators, (Breivik in Selwyn, Marriott & Marriott 2000: 167, Schutt in Shaw & Polovina 1999: 2) this new learning environment (in relation to this article referring to online computer education without any traditional face-to-face contact) threatens the very existence of the traditional education sector, particularly residential undergraduate education, while others (Davey 1999: 45, Russel in Farber 1998: 801, Harasim in Brown 1997: 117) even perceive these “virtual offerings” as to be equivalent to the traditional undergraduate experience - in a sense even more tailored to the specific needs of individuals and groups (Mayor 1996: 38).

DISTANCE EDUCATION AND OPEN LEARNING IN PERSPECTIVE

The author would like to begin by determining the initial driving forces behind the introduction of new information and communication technologies, specifically the enormous move towards distance education

and open learning, and put the magnitude of the task of training, retraining and creating expanded opportunities within context.

This new learning environment is the result of increasing pressure on higher education institutions by governments, the public, business, and students, to make greater contributions to economic growth and development (Green & Hayward 1997: 11); provide cost effective education (Langlois 1998: 285); ensure job training and competitiveness (Bates 1995: 230); and, in addition, deliver more flexible and relevant educational programmes (Charp 2000: 6) - thus making education more effective, more affordable and more accessible (Farrington 1999: 38). More specifically these pressures stem from large scale industrial restructuring and technological developments (Pitcher & Purcell 1998: 179), resulting in a complex, diverse and demanding society and professional market, in which a higher skilled workforce need to be re-trained numerous times in their working lives if they wish to remain employed (De Alva 2000: 52). Access to convenient lifelong learning opportunities is therefore essential, and progressively becomes more critical.

The requirements of this new market/sector are very different from those of the youngsters the system has traditionally served (Bates 1995: 230). This new learning environment is based on the need to provide formal or informal training and retraining, in the workplace, for a diverse body of mature learners, tailored to their individual needs (Diaz & Cartnal 1999: 132) and delivered at any time in any place. For De Alva (2000: 53) this growing number of adult learners are "demanding a professional, businesslike relationship with their campus that is characterised by convenience, cost- and time- effective services and education, predictable and consistent quality, seriousness of purpose, and high customer service geared to their needs".

IMPERATIVES POSED BY A CONSTRUCTIVIST APPROACH TOWARDS TEACHING AND LEARNING

Coupled with the lifelong learning requirements and expectations among more mature and adult students detailed above, is the subsequent and inevitable shift towards a more constructivist and asynchronous approach (McSeveney 2000: 5) of participation in higher education. This new paradigm of learning, although not exclusive to distance learning and extensively used in contact education, does allow for the flexible learning patterns needed by this sector, but places learning firmly within control of the student.

It is expected of students in this new learning environment no longer to be 'passive' recipients of explicit knowledge and instruction (Megarry in Brown 1997: 116), but more active participants that use higher order thinking skills and multiple perspectives of a phenomenon to construct their own knowledge and meaning (Henderson in Kennedy 1997: 3, Pham 1998: 111, Laurillard in Brown 1997: 116) - thus signalling a shift from "reproductive to higher order learning activities and an emphasis on meaning-directed and investigative styles of learning" (Trigwell & Prosser in McLoughlin 1999: 225). More specifically, this new learning paradigm relies heavily on students' independent learning and self-pace (Salomon & Almog 1998: 228), increasingly carried out in a distance learning environment without any formal structure, location or schedules. Students can access material according to whatever daily schedule their other personal and work obligations allow (Davey 1999: 45) and in a manner more suited to their own individual needs and interests (Bain & McNaught in Kennedy 1997: 5).

Active learning is further encouraged by the inclusion of self-directed learning activities (Megarry in Brown 1997: 116) as well as the use of various information and communication technologies such as e-mail, bulletin boards, listservs, chat rooms, discussion lists, video and audio taped materials, on-line testing applications, and telephone communications, to name but a few, in order to provide a rich learning environment and replicate traditional face-to-face contact (Davey 1999: 45), specifically classroom instructions and collaborative learning between students.

THE UNDERGRADUATE EXPERIENCE

The main force that will constrain the unlimited spread of undergraduate distance learning in “virtual” online classrooms, and something the author cannot over emphasise, is the fact that most average eighteen-year old undergraduates (our typical first year students), even the smartest and most capable ones, are simply not ready or mature enough, to succeed outside of a structured learning environment (Farrington 1999: 40). Henderson in Kennedy (1997: 4) supports this view and is of the opinion that the most effective application of constructivist learning environments is to the stage of advanced knowledge acquisition, where students already have well-formed schema, mental models, knowledge integration, and prior knowledge. Most of the undergraduates are not sufficiently self-directed to manage this “virtual” learning environment (Farrington 1999: 40), and have enormous difficulty with self-discipline and self-monitoring (Salomon & Almog 1998: 225).

Furthermore, independence and lifelong learning skills, as well as higher order thinking skills (the construction of knowledge and meaning), have not yet been developed at this stage (Bates 1995: 246) and these students, in order to thrive, seem to need the structure, discipline, boundary-setting, guidance, motivation-sustaining functions, and regular face-to-face contact that a regular classroom with its peers and instructor would usually provide (Salomon & Almog 1998: 229).

RESEARCH ON UNDERGRADUATE TEACHING AND LEARNING

Decades of extensive research on undergraduate teaching and learning confirm this need for extensive face-to-face contact and communication between students and instructors, as well as the reciprocity and cooperation among students (Chickering and Gamson in Chizmar & Williams 1997: 2). Frequent student-instructor interaction and dialogue in and out of classes (O’Reilly & Morgan 1997: 2), as well as students’ peer interaction (Austin in Farber 1998: 799) are regarded as an essential part of the residential experience. This interaction is seen as of central importance for the achievement of educational goals (Davey 1999: 45) as well as the motivation and involvement of students (Gamson in Farber 1998: 800), inevitably thus encompassing teaching and learning (Harasim in Brown 1997: 117). Beyond knowledge of subject matter, and beyond the quantitative and verbal skills and the higher level cognitive skills that are typically tested and measured (Pascarella & Terenzini in Farber 1998: 802), it is ultimately this context-linked interpersonal interaction, discussion, debate, experimentation, and inspiration, all referring to basic human needs (Shaw & Polovina 1999: 2), that are truly worth the undergraduate residential experience (Farrington 1999: 43), and that leads to changes in attitudes, values and aspirations (Pascarella & Terenzini in Farber 1998: 800) - a context the author refers to as “the total experience”.

There seems to be general agreement then, that “the total experience” serves a variety of crucial functions, especially for undergraduate students, and that the remarkable transformation of these residential students is as much the product of the general intellectual and social experiences on campus as the result of what goes on formally in the classroom. However, although some of the commentators (Davey 1999: 45, Harasim in Brown 1997: 117), as well as various other studies (Russel in Farber 1998: 801), agree and conform with the principles of “the total experience”, they still argue that distance education is as effective as face-to-face learning and that the use of information and communication technologies offer a potentially rich learning environment which can replicate or even be equal to “the total experience”. These contradictions are directly a result of very limited and inconclusive research on the effectiveness of distance education and the introduction of new information and communication technologies (Petrik - Online, Merisotis & Phipps 1999: 14). Some of the studies for example show that Internet students achieved lower cognitive and affective gains than their on-campus counterparts (Chizmar & Williams 1997: 8), while in other studies they out-performed them (Schutte in Chizmar & Williams 1997: 8). Various studies looked at by Russel in Farber (1998: 802),

also indicate that there are “no significant difference” in the effectiveness of different instructional methods and that “the technology used to deliver instruction will not impact the learning for better or for worse”.

Despite the fact that too much emphasis seems to be placed on the “utopian” possibilities rather than the practical implications of technology (Merisotis & Phipps 1999: 14), and that there is also no discrimination between the user needs of different sectors of the educational world (Bates 1995: 244), the main reason for these inconclusive and contradicting findings is that this research is only concerned with straightforward academic performance/measurable competence (Farber 1998: 802). Students pay money, punch in the requisite competencies and degrees come out. There is no concern, whatsoever, with such questions as: What are the implications for the loss of face-to-face interaction between students and instructors that takes place in a traditional classroom? and, What about the loss of peer interaction among students? (McSeveney 2000: 5), referring to the social aspects of learning. But, if measurable competence is all we are after, thus producing training, and not education (Farrington 1999: 38), then not only don't we need universities, we have no need whatsoever to invest and maintain expensive learning technologies, since it is perfectly clear that for example, radio, telephone, and the postal service will do the job as well, at a minimum cost.

The author shares the opinion of Farber (1998: 804) that “when students, in isolation, receive decontextualised instruction geared solely to the demands of the market, when the most enriching, broadening, and life-enhancing elements – the most transformational elements – have been stripped away from education”, it is difficult to imagine how anyone can regard it to be as equal to or even replicate “the total experience”.

REALITIES IN SOUTH AFRICAN UNDERGRADUATE TEACHING AND LEARNING

The need for residential undergraduate education, that is “the total experience”, is particularly evident in South Africa, and although it refer to all our undergraduates, it is, as mentioned, especially evident of those diverse body of learners from non-traditional backgrounds, that enrol into tertiary institutions under-prepared. This phenomenon in South Africa is specifically the result of the fact that society is characterised by extreme disparities and inequalities, with over seventy percent of the population that belong to the third world with poverty, unemployment, poor communication networks (9.5 main telephone lines per hundred people), little educational opportunities and, in the main illiteracy (Hall 1998: 147). Coupled with this is the price of under-resourcing, poor quality of education, a breakdown in the culture of learning and teaching, vast disparities in infrastructure (Bagwandeem, Bojuwoye, Lebete, Letsie & Matobako 1999: 2), and widespread inequalities in access to educational and information services that students and teachers have to pay for due to apartheid segregation (Hall 1998: 149). Until very recently, many of the new information and communication technologies were totally unknown to the vast majority of learners in South Africa, and most students in disadvantaged communities with under-resourced educational systems, still do not possess or have access to basic technologies such as the telephone and audio recorders.

In particular many of these non-traditional students enter higher education with demonstrated potential to succeed but with the burden of their physical and socio-cultural environments as well as poor quality primary and secondary education. The effects of these physical and socio-cultural environments, coupled with poor quality education, came to the fore, and again emphasised the need for “the total experience”, when an extensive study by The University of South Africa (UNISA), South Africa's largest distance education institution, investigated reasons why the academic performance among their non-traditional (black) students was the poorest when measured against that of students of other racial and cultural categories (Van Heerden 1997: 76).

Van Heerden's study (1997) revealed that the domestic environment in which the majority of these students grow up is poorly equipped with items important for intellectual development, such as reading matter, radio,

television and toys. This domestic environment is furthermore characterised by poverty and either semilliterate or illiterate parents, that do not provide the necessary stimulation and home environment that function as part of a support system for the world of learning (Van Heerden 1997: 78). There is thus little to stimulate thought about matters outside immediate experiences and these students are expected to accept matters at face value. Most of the students initially experience the school, which is embedded in the Western culture, as a 'strange and impractical place'. The study also confirmed a statement by De Boer (1997: 159) that the curriculum includes aspects, for example foreign countries, airports and the sea, that are unfamiliar to most students, and in spite of pictures and photographs, cannot successfully accommodate the new information into their frame of reference (Van Heerden 1997: 79). This absence of an appropriate frame of reference allowing data to be accommodated and interpreted, together with the fact that the languages of instruction, Afrikaans and English, are foreign to most students, led to a school system that is still characterised by rote-learning (memorisation) and the reproduction of information without comprehension, thus the lack of analytical thinking and creativity (Van Heerden 1997: 80).

A major research project involving institutions in the Western Cape confirms the aforementioned statement and also found that students from disadvantaged backgrounds come to tertiary education with a dualistic view and expect to be 'provided' with the 'correct' answer. They find it very threatening to be presented by different points of view and a lecturer's expectation that they should be able to distil and defend an individual position (Sayed & De Jager 1997: 11). More specifically the school system in general is based on an instructionist approach to learning and does not provide for the development of independent and lifelong learning skills. It must be noted however, that it is envisaged that Curriculum 2005, if properly implemented, will eradicate this situation in schools.

Furthermore, despite the domestic environment and the school system, the study at UNISA also revealed that the physical environment of these students poses great difficulties in their study activities. Neighbourhoods in the evenings are too noisy to study and students have to study in homes that lack electricity and have inadequate space, making it very inconvenient. Students also have difficulties contacting lecturers and other students because of a lack of, or problems with telephones and the postal service in black residential and rural areas (Van Heerden 1997: 81).

Other prominent observations from the research at UNISA, and still relating to the need for "the total experience", are that these students did not study systematically and intensively. There was also a tendency among these students to attribute their underachievement to external factors and disregard the element of personal responsibility in terms of individual input (Van Heerden 1997: 84). It appears that, besides the above-mentioned socio-cultural factors, there are aspects of African thought woven into students' daily lives, which may shed further light on the way they deal with their studies. Their concept of time led to a situation that they never planned but studied 'when time was available' (Van Heerden 1997: 83). Studies were further regarded as subordinate to people and human relations and they did not study over weekends since weekends are for funerals, marriages, relaxation and in generally for spending time with other people (Van Heerden 1997: 84). Education is furthermore seen as a commodity, something you can buy or be given. This has led to the idea that education can be given to or withheld from a person, and people view themselves as passive receivers or unfairly disadvantaged non-receivers. The perception further leads to students believing that they may boycott classes and then take sudden remedial action to be 'given' enough education to succeed in the examination (Van Heerden 1997: 84).

It is obvious then that it is necessary to provide extensive learner support throughout the years of university study so that students can develop the necessary skills and gradually move towards a more constructivist approach. Such programmes thus require the close attention of experienced and qualified instructors who can work with these students in realising their potential - needs that cannot be met by any 'virtual' offering. The author, based on personal experience, can confirm this need to *gradually* move towards a more

constructivist approach. Introducing first year students from non-traditional backgrounds to a resource-based learning environment and reducing face-to-face contact time resulted in very high failure rates. The need for peer group contact and contact with the facilitator was regarded as so important among these students that contact hours had to be increased during their first year.

However, despite the above-mentioned scenario, South Africa does have, especially in certain sectors of society, a reasonably well-developed distance education and open learning infrastructure that delivers undergraduate programmes. This infrastructure is supported by a well-committed policy environment, and was emphasised as a way to increase access and improve quality in education. But, although the current infrastructure is reasonably well established and will probably expand in future, it appears that we are repeating many of the mistakes made around the world. There is a widespread legacy of failed technological initiatives in South Africa as well as serious concerns about the efficacy, appropriateness, effectiveness, and overall quality of current distance education provision (Butcher - Online). The problem seems to be the growing interest of traditional face-to-face institutions as well as online profit-making enterprises, in using distance education methods as a strategy for coping with dwindling finances and growing demand for places. The emphasis for these institutions is so much on the increase of student numbers and/or income, that they are using certain distance education methods and cheap versions of information and communication technologies (Butcher - Online), with little or no concern for the educational quality, principles and issues that must drive these choices. These considerations, or rather lack of them, coupled with the student profile outlined above seem a definite blueprint for failure and explain the concerns mentioned, but also the low throughput and completion rates of many of these programmes. Making this scenario even bleaker, and relating to the previous point, is the fact that many institutions, due to the pressure of student numbers and scarcity of resources, limit the scope of their learners need analysis and profiles and cannot ascertain the prior knowledge, motives, background interests, attitudes and experiences of their learners – information essential for effective teaching and learning. Students are expected to fit into the system and to cope the best they can.

The author has no doubt that distance education and open learning has a major role to play in opening access to cost-effective education, but the focus, as mentioned, must be on the continued and lifelong learning requirements of more mature students, and not undergraduate education. The concept of lifelong learning and the prevalence of information technology dictate that institutions of higher learning should first equip students with these skills, and students must be assisted to move away from a student-centred learning approach to a more independent learning approach, so that they could become lifelong learners. To conclude on a more positive note, it must be stated however, that most higher education institutions consulted by the author, are particularly sensitive towards first year programmes in which technology is the dominant mode of delivery, and do their utmost to implement a “high touch” “high tech” approach where technology plays only a supportive and supplementary role.

CRITICAL ISSUES IN THE EFFECTIVE IMPLEMENTATION OF TECHNOLOGIES - THE WAY FORWARD

Although there is little doubt in the author’s mind as well as in the minds of many others (Charp 2000: 6, Farrington 1999: 40, Davey 1999: 45, Sims 1999: 257), that information and communication technologies can never effectively replace “the total experience” and that the formal classroom environment, especially on undergraduate level in South Africa will prevail, the author is hesitant to say that learning should *never* take place without a human interface. The author believes that the use of information and communication technologies in South African institutions has the potential to enrich our teaching and learning, but, that these institutions would do well to remember that for the foreseeable future, due to the complexity and diversity of our learning goals and the learning needs and circumstances of our students, a very wide range of classroom activities, from the traditional face-to-face lecture to virtual reality experiments, will be used for different purposes and continue to serve the needs of our students. Bates (1995: 224) also supports this idea with the

notion that “there will always need to be a balance between face-to-face contact at a residential level, interpersonal contact through telecommunications, and interaction between an individual and a piece of technology”. What we need to discover and be aware of, however, are the principles that determine this balance and the different sectors involved, ranging from undergraduate first years to mature students and adults.

If the South African education sector wishes to eliminate failed initiatives and unfulfilled expectation it must furthermore remember that the introduction of information and communication technologies is not only about cost-saving in infrastructure and a wider potential customer base, but that various measures with regard to the design, delivery, instruction, learner support and quality must be taken to ensure the enhancement of teaching and learning. As the broad principle of learner-centeredness starts to gain credence in South African education and training, it becomes ever more important to be aware of the features of the group or groups of learners for which a planned or existing programme is intended. I also want to emphasise that ‘The Everest Syndrome’ identified by Maddux in Selwyn *et al.* (2000: 182), that is, computers must be used in education simply because ‘they are there’, is a dangerous and ultimately damaging approach for institutions to take. Successful implementation and integration of information and communication technologies in education depends more on the need to design an appropriate and effective learning environment, with clear educational benefits for a particular sector or group of students, than on producing a delivery medium per se. In other words, it should be more concerned with the design of the entire experience, ultimately promoting educational excellence, than with any particular delivery medium - education versus technology.

The author totally agrees with MacFarlane in Selwyn *et al.* (2000: 181) that if education technology is to succeed it must be supplementing and complementing - not displacing traditional methods and means of teaching and learning, and that extensive research is required to determine what technology does best and how it can be manipulated to provide effective learning environments (Sims 1997: 70). The goal should be a more personal educational experience, not a dehumanised system of learning by machine (Farrington 1999: 38). Of specific relevance for the South African situation the author would like to suggest that the most important direction undergraduate education can take is not to transfer education from the classroom to the screen, but to learn to make better use of the classroom, and learn to exploit the advantages of real time, real space, and real community. Our notion of how we teach traditional learners on campus is in need of drastic revision. The overall goal should be to make residential undergraduate education more effective and in the words of Farrington (1999: 41) “improve what can be made better, leave alone what is working just fine, and have the good sense to know the difference”.

The author wants to conclude this paper with a set of questions that Bates (1995: 1) suggests all institutions ask themselves in order to analyse the effective implementation of information and communication technologies. He groups these questions under the following criteria: • Access: how accessible is a particular technology for learners? How flexible is it for a particular target group? • Costs: what is the cost structure of each technology? What is the unit cost per learner? • Teaching and learning: what kinds of learning are needed? What instructional approaches will best meet these needs? What are the best technologies for supporting this teaching and learning? • Interactivity and user-friendliness: what kind of interaction does this technology enable? How easy is it to use? • Organisational issues: what are the organisational requirements, and the barriers to be removed, before this technology can be used successfully? What changes in organisation need to be made? • Novelty: how new is this technology? • Speed: how quickly can courses be mounted with this technology? How quickly can materials be changed?

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