

## Articles

# Revisiting the five generations of distance education: Quo vadis?

**J. F. Heydenrych**

University of South Africa  
South Africa  
email: heydejf@unisa.ac.za

**P. Prinsloo**

University of South Africa  
South Africa  
email: prinsp@unisa.ac.za

### Abstract

The history of distance education (DE) has been documented and researched by many scholars in the past. Different scholars have attempted to categorise different phases of the development of DE, as it responded to changes in technology and learning theory. These genealogical models propose a number of generations, ranging between three and six. All of these models propose the advent of DE to be based in correspondence education in the early 1900s. According to the majority of DE genealogical models, the invention of the printing press is *the* definitive moment in the history of DE. Since then, the evolution of different technologies has shaped DE and our understanding of DE's development and future.

In this article we attempt to provide a richer picture of the development of DE. We describe not only how, through the ages, DE has responded to distance and the Medusian gaze of technology, but also how pedagogy, the ownership of 'content', the understanding of the curriculum and the broader context of higher education have shaped (and still shape) DE. In this article we reflect on the generational models and ponder on the role of content, communication and context in the development of DE. We question the claim of technology as the *only* driver of development in DE. An understanding of the development of DE, responding to developments in pedagogy, context, technology and the broader educational project, provides DE practitioners with a better basis to understand current challenges and plan accordingly.

## INTRODUCTION

Distance education (DE) has evolved over centuries and its one distinctive characteristic was, and still is, the physical separation between the delivering institution and its students. It is important to note that ‘distance’ in DE refers to more than just the geographical distance between the delivering institution and its students, it also includes time, economic, social, educational, epistemological and communication distances. Addressing the different types of distances that DE faces has overshadowed the pedagogical and epistemological foundations of choosing effective teaching strategies. Faced with the challenge of overcoming distance, DE institutions embraced technologies to bridge the geographical distance, forgetting that distance is a multi-dimensional construct.

In this article we will first provide a broad overview regarding developments in DE, such as the increasing convergence of DE and face-to-face education, and the notion of ‘openness’. The blurring of the borders between DE and face-to-face institutions provides a ‘window of opportunity’ to critically engage with the historical genealogical models in DE. We provide a brief overview of the literature on the generational models in DE, before engaging with the different generations by providing an enriched and critical perspective on each. The main thrust of this article is not only to enrich the understanding of these models, but also to look at the origins and generations of DE from a *different* point of view. This view allows us to explore DE in a developing world context and reflect on the appropriateness of current generational thinking to understand some of the challenges DE in the developing world faces.<sup>1</sup>

We question the claim in current generational models that developments in technology, and the capturing of content, were and are the *primary* drivers of development in DE. An understanding of the development of DE, responding to developments in pedagogy, context, curriculum, technology and the broader educational project, provides DE practitioners with a better basis to understand current challenges and plan accordingly.

## A BRIEF OVERVIEW OF BROADER DEVELOPMENTS IN DISTANCE EDUCATION

### Blurring borders

UNESCO (1997, 10) points to the difference between DE and ‘conventional’ or ‘face-to-face’ teaching, emphasising that though ‘there is a clear distinction in theory between DE and conventional or face-to-face education, *the distinction in practice is far from clear*’ (emphasis added). With conventional universities

increasingly using blended or hybrid forms of delivery, teaching, learning and support (UNESCO 1997, 10–11), the borders between the two modes of delivery have become blurred. The growth and accessibility of new technologies increasingly allows traditional face-to-face institutions to explore asynchronous teaching, learning and student-support strategies. The same technologies also impact on traditional DE institutions, with synchronous communication between institution and students becoming a viable option. The traditional assumption that students attending face-to-face institutions are full-time students, has also been shown lately to be incorrect (Yorke and Longden 2007) and face-to-face institutions are making increased use of blended learning options, including synchronous and asynchronous teaching, learning and support. ‘There is therefore a blurring of the strict separation between conventional and distance education’ (Tait and Mills 1999). The traditional definitions and descriptions of both face-to-face and DE blur, resulting in a range of possibilities for both modes. The use of technology to facilitate and enrich learning in *both* modes provides a window of opportunity to critically examine the role of technology as the defining characteristic in historical genealogical models of DE.

### **DE going open ...**

Although open distance learning (ODL)<sup>2</sup> is discussed in the same breath as DE (e.g. Belawati and Baggaley 2009; MacIntosh 2005), not all DE institutions embrace ODL, while all ODL institutions are also regarded as DE institutions. Belawati and Baggaley (2009, module 2a, 1) describe ODL as ‘a system that combines the methodology of DE with the concepts of open learning and *flexible learning*’ (emphasis in the original).

In this article we question the defining characteristic of DE and ODL (and face-to-face institutions) as the way these institutions use technologies. In the previous paragraph we stated that the borders between DE and face-to-face institutions are becoming increasingly blurred due to the use of technologies. We therefore disagree with the UNESCO (1997) explanation that the use of technology is the defining difference between DE and ODL. ODL is a unique form of DE, in which ‘openness’ presents an *ideological* position affecting not only access and availability, but increasingly our assumptions regarding knowledge production and facilitation.

In South Africa, more and more school leavers (and therefore younger, unemployed students) are entering DE. This newer category of ODL candidates, looking for an affordable option, is often underprepared by the school system and struggles to adapt to higher education (see, for example, Scott, Yeld and Hendry 2007). The challenges in ODL are, therefore, intensified as the host institution

has to address compensating for the distance between itself and its students, which often results in student isolation. At the same time they need to cater for mature adults *and* underprepared school leavers as two distinct categories with different expectations and competencies (or lack thereof), which influence the nature of the learning experience.

From a developing context, solutions that focused on the use of technology to reproduce content en masse, and to communicate effectively (facilitation), neglected the potential of context and the ownership of learning in the community. The assumption is that although the mass production of text and the mail system promised the mass delivery of texts, and new ICTs promised to provide a solution to mediation and facilitation, this never made allowances for the challenges of affordability. Our assumption is that the future will require a shift to community ownership of DE and resources from the context, in order to make DE affordable and successful.

## ENGAGING WITH THE GENERATIONAL MODELS IN DISTANCE EDUCATION

### A brief overview

The metaphor of ‘generations’ is frequently used to explain and describe the different phases of development in DE or paradigm shifts that occurred (see, for example, Bates 2005; Belawati and Baggaley 2009; Moore 1993). Two crucial challenges emerge from these developments: the challenge of creating, capturing, duplicating and delivering content; and that of facilitating and supporting learning. The current portrayal of the development of DE in different generations addresses these issues selectively, at different stages. Table 1 provides an overview of some of the models presented by a number of authors since 1995.

**Table 1:** An overview of some generational models

<b>Garrison (1995) [in Peters, 1998]</b>	
<b>1<sup>st</sup></b>	Correspondence – single medium (print) – mass production of content
<b>2<sup>nd</sup></b>	Teleconferencing – audio – communications network – synchronous
<b>3<sup>rd</sup></b>	Multi-media, computer-assisted learning and communication – interaction with content
<b>Lauzon and Moore (1989)</b>	
<b>1<sup>st</sup></b>	Correspondence – single medium (print) – mass production of content
<b>2<sup>nd</sup></b>	Teleconferencing – audio – communications network – synchronous

<b>3<sup>rd</sup></b>	Multi-media and computer-assisted learning – interaction with content
<b>4<sup>th</sup></b>	Student control and sharing collective intelligence – Internet/WWW
<b>Guglielmo (1998)</b>	
<b>1<sup>st</sup></b>	Correspondence – single medium (print) – mass production of content
<b>2<sup>nd</sup></b>	Multi-media and computer-assisted learning – interaction with content
<b>3<sup>rd</sup></b>	Group communication – Internet/WWW communication technologies
<b>Taylor (1999 and 2001)</b>	
<b>1<sup>st</sup></b>	Correspondence – single medium (print) – mass production of content
<b>2<sup>nd</sup></b>	Teleconferencing – audio – communications network – synchronous
<b>3<sup>rd</sup></b>	Multi-media and computer-assisted learning – interaction with content
<b>4<sup>th</sup></b>	Flexible learning via online delivery – communication enhanced online
<b>5<sup>th</sup></b>	Intelligent flexible learning – automated content and responses and campus portals
<b>Moore and Kearsley (2005)</b>	
<b>1<sup>st</sup></b>	Correspondence – single medium (print) – mass production of technology – correspondence
<b>2<sup>nd</sup></b>	Radio and television broadcasting
<b>3<sup>rd</sup></b>	Combined approach – correspondence assisted by broadcasting (open universities)
<b>4<sup>th</sup></b>	Telelearning – interactive audio/video conferencing
<b>5<sup>th</sup></b>	Online delivery – multimedia interactive content with online communication and support

In many ways these generations have, in general, focused only on the manner in which *technology* impacted on the possibilities for teaching, learning and student support (e.g. Lauzon and Moore 1989; Moore and Kearsley 2005; Peters 1998; Taylor 1995 and 2001) and, to a lesser extent, on changes in educational theory (Bates 2005, 138). All the generational models (as put forward by these authors) propose the first generation of DE to encompass all forms of correspondence education, with its defining characteristic of the mass printed production of content. Lauzon and Moore (1989) propose four generations, whereas Garrison (in Peters 1998) proposes three (see also Guglielmo 1998), while Taylor (1995 and 2001) as well as Moore and Kearsley (2005) propose five generations. Although the authors proposing a five-generation model differ regarding the

exact definition of the third to fifth generations, the five generational models have the most currency in literature (see Bates 2005; Belawati and Baggaley 2009).

### **Weaknesses in the current models**

In our opinion, the five-generation models, as proposed by Taylor (1995 and 2001), and Moore and Kearsley (2005), have four main weaknesses.

The first weakness is that these models equate the origin of DE with the invention of the printing press and correspondence, thereby ignoring earlier forms of DE. If one takes as a broad working definition for distance education any effort where the teacher or instructor has 1) the *intention* to teach or instruct and 2) where the recipients of the instruction are *separated* from the teacher/instructor by time, geographical, epistemological and other distances, then the printing press, however significant, was not the 'origin' of DE. We will expand on this proposition in the next section.

The second weakness is that these models focus almost exclusively on the impact which technology had on the delivery of teaching and learning as the *definitive* factor shaping DE. While some authors (e.g. Moore and Kearsley 2005) refer to learning theories and their interplay with the development of different generations in DE, we propose that limiting the development of DE to advances in technologies and learning theories is impoverishing our understanding of the richness of the evolution and growth of DE.

The third weakness of these models is the emphasis on technological development *as a basis for exploring the future of DE*. We believe that the broader notion of *communication* (and not technology), developments in learning theory, curriculum and innovative student support in an era characterised by fluid networks (Castells 2009), risk and super-complexity (Barnett 2000), necessitate a more careful look at developments in this field.

Close scrutiny reveals that each of the different generations encompasses much more than just the impact of technology on the delivery of teaching and learning. For example, we also need to look at the role and reliance on different pedagogies and learning theories; who owned the content; what type of interaction was possible and deemed necessary; what mediums were at the disposal of both the institution and the students; how learning experiences were developed and produced; and how these interactions were stored and delivered. Looking at the different generations through this *multidimensional* lens provides a much richer picture of the generations than was previously possible.

The fourth weakness in the current genealogical models is *the disregard for context* in which DE fulfilled (and still fulfills) a specific role. The disregard of context results in most genealogical models universalising trends and making

claims regarding the next generation of DE. We propose a context-specific understanding of the development of DE, enriching our understanding of both its development and potential. In a developing context like South Africa, there are huge disparities within the potential student audience regarding access to technology as well as preparedness for higher education. We propose that the context matters. The implications of not taking the impact of context seriously in our thinking about the development of DE, often result in generalising claims regarding the role of technology and/or tutoring. The present classification and use of the genealogical models of DE also result in claims that specific institutions are *still* a third- or fourth-generation DE, while another institution is a fifth generation, without seriously considering the institution's context and the appropriateness of its responses to the context.

## REVISITING THE GENERATIONS OF DE

### Early roots of DE

Most of the current literature on the generations in DE proposes the advent of DE to be closely linked to the development in technologies, e.g. the printing press. Schlosser and Anderson (1994, 2), for example, state that '[t]he roots of distance education are at least 150 years old', while Moore and Kearsley (1996, 20) refer to the origin of DE in the United States (US) as beginning with 'courses delivered by mail'. Perraton (2007) states broadly that *modern* DE began in 1963 with the establishment of the National Extension Institute in the United Kingdom. These proposals for a 'starting date' for DE originate from a North-Atlantic canon of knowledge and seriously discount broader developments in education and human development. Our proposal for a different first generation not only contests current Eurocentric proposals regarding the history of DE, but also petitions for a less myopic (and North Atlantic) understanding of the development of DE in a postcolonial critique.

The first rock art in the form of images and symbols is estimated to have been created at between 40 000 and 32 000 BCE. Paintings were made on the walls of caves and outcropped rock surfaces. At Ukhahlamba-Drakensberg, the San people settled about 8 000 years ago and produced rock paintings. These paintings, which contained stories related to hunting and natural phenomena, served as instructions for passersby (nomadic people), visitors or next generations. This type of 'instruction' can be seen as the first form of DE, as the originator(s) of the message was not present when the message or content was encountered. The 'teacher' could not purposefully pace the actual incident of instruction – learning was incidental, to a large extent. Often the messages were coded in tribe-specific

images and characters which may have been inaccessible to passersby and outsiders to the tribe or clan.<sup>3</sup> The use of these images and rituals reminds one of the use of frescoes, paintings and sculptures by the Christian church and other religions to communicate with (and educate) the masses.

With the development of written language (about 5 000 BCE) in early forms of Egyptian and Chinese, for example, the ‘capturing of the message’ became different, if not easier. Egyptian messages were first produced on tablets, buildings (as part of the architecture) and interior decoration for documenting genealogies and conquests, as well as for religious purposes. Script was later recorded on papyrus (around 3 500 BCE), and later on parchment. Scrolls were often bound in collections or sets of scrolls which resemble a ‘book’ in modern terms. In the Middle Ages (around 300–400 CE), hand-written and copied books replaced sets of scrolls when sheets of paper were stitched or glued together. Books and letters were copied, stored and circulated. The contents of these books were purposeful in that they ‘prescribed and directed’ history and educational initiatives. Knowledge was transmitted to ‘learners/students’ and their actions were required to conform accordingly. The early achievements of this era – in terms of written language and the production of content – are mostly disregarded in terms of their value to education and how these efforts laid the groundwork for the later development of correspondence education.

The *curriculum* of this period was determined by an understanding of the skills and knowledge necessary to survive, and this curriculum was developed and sanctioned by the powerful elite (whether secular or profane) and embedded in class, caste, gender and race/tribal assumptions and relations. Knowledge production in this period precedes, in many ways, the production of disciplinary knowledge (Mode 1 knowledge production, as proposed by Barnett 2004). The dichotomy between the sacred and profane, and skills and knowledge, is largely superficial. The pedagogies of this period were based on the *transmission* of information and the *enactment* of the curriculum through rituals and oral traditions.

Table 2 provides a summarised overview of the early roots of DE.

**Table 2:** Summary of the early roots of DE

<b>Period</b>	40 000 BCE – 1450 CE
<b>Key features</b>	Oral tradition, rock art, symbol and written language (hunting, ritual, survival and other information inscribed on rocks, tablets and murals – also the invention of paper and written language)
<b>Pedagogy</b>	Transmission of information, often coded to prevent outsiders from understanding

<b>Curriculum</b>	Survival and technical skills, secular and profane knowledges formulated and sanctioned by the powerful elite and embedded in gender, class, caste, and race/tribal assumptions and relations. It is difficult to categorise the knowledge production in this period as Mode 1 knowledge production. Disciplines (as is essential for Mode 1 knowledge production) do not exist and knowledge production infuses a range of sources
<b>Content owner</b>	Community and dignitaries
<b>Interaction</b>	Content based, with limited interaction and incidental exposure in the case of rock art. Interaction with tribal rituals was gendered and governed by the distinction between sacred and profane knowledges
<b>Medium</b>	Images (graphics), text and rituals
<b>Production</b>	Manual/artisan tools and performance
<b>Storage</b>	Tablets, murals, oral traditions and tribal memory. Later on knowledge was stored in scrolls and hand-written and copied books
<b>Delivery</b>	Incidental exposure to visitors/passers-by/generations, or limited to tribal rituals

## First-generation DE

All current genealogical models describe the invention of the printing press by Gutenberg (around 1450 CE) as the defining moment in revolutionised knowledge dissemination and as the beginning of the first generation of DE. Correspondence DE started in Europe, and the English educator Sir Isaac Pitman is seen as the pioneer, with his introduction of a shorthand course by mail in 1840. Anna Ticknow also seized this opportunity in 1873 in the US when she presented educational opportunities to women through home study (Nasseh 1997). Ticknow succeeded in providing correspondence to more than 10 000 students in 24 years (Nasseh 1997), and her practice saw the integration of communication, teaching and learning in printed materials, all dispatched by mail. In the literature it is classified as the first generation of DE (Guglielmo 1998, 36).

By 1920, new inventions like sound recording, photography, film and telegraphy provided new opportunities to capture and transmit content, and enable communication. The development of printing and correspondence as modes of communication, and the mail system as a delivery option, could now be enhanced through new media and technologies. New technologies, such as the lanternslide and motion picture, emerged to provide additional, visually based options to support correspondence study (Nasseh 1997).

This period saw the rise of Mode 1 knowledge production (as proposed by Barnett 2004). This aspect of the development of DE is crucial for understanding current debates in DE in the developing world, and questions like the role of DE in development and the digital divide. Table 3 provides a summarised overview of Generation 1.

**Table 3:** Summary of Generation 1

<b>Period</b>	1451–1916 CE
<b>Key features</b>	The printing press and books – correspondence – mass media and technologies
<b>Pedagogy</b>	Behaviourism (largely transmission of information)
<b>Curriculum</b>	Knowledges formulated and sanctioned by the powerful elite and embedded in gender, class, caste, and race/tribal assumptions and relations. The rise of the modern university and the development of the different disciplines. Mode 1 knowledge production
<b>Content owner</b>	Universities
<b>Interaction</b>	Content based and dominated by limitations of print technology – self-pacing – mass delivery of DE
<b>Medium</b>	Text and images – also the advent of film
<b>Production</b>	Printing press, manual design and recording
<b>Storage</b>	Books and letters
<b>Delivery</b>	Mail system

## Second-generation DE

The second generation emphasises technological developments and reach as the main drivers of this generation. As we will illustrate, this generation did not see any major changes in curriculum development, content ownership or pedagogies.

The second generation of DE introduced a number of new mass media technologies that enabled content to be delivered to students anywhere, while requiring minimal equipment (first radio and then television). It was also possible to improve the quality of the message (content) with the help of these technologies. In 1917, radio emerged and paved the way for instruction to go on air. Wood and Wylie (in Purdy 1980, 16) mention the University of Wisconsin as the first to go on air with its station 9XM. In the US, the federal government granted over 202 radio broadcasting licences between 1918 and 1946 to educational institutions; however, the technology failed to attract a large audience, and by 1940, only one

college-level credit course was still offered through instructional radio (Nasseh 1997).

Although Baird demonstrated the first television system in 1926, and attracted great interest from educators, by 1948 only five institutions in the US had adopted television, with Iowa State University being the first to go on air (for a full description see Jeffries, n.d.). The US military were the first to undertake any audiovisual education or training (film and audio recordings) after the Second World War, training large numbers of recruits to operate sophisticated weapons (Horton 2000, 4). By 1962, 74 educational stations were broadcasting (Purdy 1980, 18).

By the 1950s, mass DE was well established both on air (radio and television) and via mail systems (correspondence). The University of Wisconsin took the lead and expanded delivery via distance in the US. In Africa, the University of South Africa (Unisa) (today one of the world's mega-universities) was established in 1946. The apparent success of correspondence and other forms of transmission-based DE (radio and television) was challenged with the invention and development of computers.

The development of a range of technologies impacted in major ways on the first and second generations of DE (in traditional genealogical models, these are the first and second generations). These generations were firstly about correspondence (texts) and the use of media, and focused largely on the production of the curriculum, as embodied in the content (learning materials) and its transmission and delivery to students (see Peters 1998; Wedemeyer in Garrison 2000). The mantra of this period was independent study and the transmission of content, with little (if any) interaction between students and the delivering institution. The responsibility of the institution was to develop the content and ensure its delivery to its students. These generations had a profound influence on the evolution of mega-universities like Unisa and the Open University of the United Kingdom (OUUK) in terms of production systems and organisational planning. However, the communication and interaction challenge remained unsolved, while there were no changes in curriculum assumptions or the practices and pedagogies used. Mode 1 knowledge was produced and sanctioned. Table 4 provides a summarised overview of Generation 2.

**Table 4:** Summary of Generation 2

<b>Period</b>	1918–1955
<b>Key features</b>	Progress in media recording, film, animation, radio and television – mass media and technologies
<b>Pedagogy</b>	Behaviourism/cognitivism (still dominated by transmission of information)
<b>Curriculum</b>	Curricula formulated in different disciplines and embedded in gender, class, caste, and race/tribal assumptions and relations. The discipline becomes the ruling mantra. Mode 1 knowledge production
<b>Content owner</b>	Universities
<b>Interaction</b>	Content based with limited interaction – mass delivery of DE and controlled access based on gender, class/caste, culture and age
<b>Medium</b>	Text, images, sound and video (film) – the start of instructional television
<b>Production</b>	Printing press, sound and video/ film recording, manual and computer design/ programming
<b>Storage</b>	Recordings – audio cassettes and video cassettes
<b>Delivery</b>	Mail system/television/ telephone/sound playback equipment

### Third-generation DE

In 1938, Konrad Zuse completed the Z1, the world's first program-controlled computer (Schmidhuber n.d.). In 1941 he completed the Z3, which was the world's first *fully functional* programmable computer. By 1950, there were fewer than a dozen electronic computers and these 'electronic brains' were so big and generated so much heat that they filled air-conditioned warehouses. Stanford University teamed up with IBM in the 1950s, to offer computer-aided instruction in elementary schools (Horton 2000, 4).

Early forms of instruction via computers took the form of computer-assisted instruction (CAI) or computer-based instruction (CBI). After this form of technology was acknowledged as a means of transmitting knowledge, the early computer systems were more readily accepted as educational tools. The first real breakthrough in this sense occurred in the 1960s, when the University of Illinois and the Control Data Corporation planned and developed PLATO (System Programmed Logic for Automatic Teaching Operations), which incorporated sophisticated branching necessary for teaching complex subjects. By 1985, over 100 PLATO systems were in use in the US, and students had logged over 40 million hours of instruction (Horton 2000, 4).

However, these achievements were in essence about human–computer interaction, thereby facilitating access to a specific content area, *rather than collaborative learning experiences based on interactive communication*. The curriculum and pedagogy had not changed from that of the previous generations. The curriculum was determined by the institution/lecturer and the pedagogies were still based on the belief that learning happens when content is transmitted to the student and learned. The use of technology did not impact on the nature of the knowledge produced (Mode 1) and transmitted. Students could access the material in their own time and at their own pace, thereby ‘gaining’ the required knowledge. Although this was a form of ‘interactive’ learning (human and machine), it did not yet represent an extensive use of computers in education, and also did not represent efficient two-way communication over a distance.

In this DE generation, two-way communication with and between students remained minimal. Learning was not seen as a *social* process in which priority is given to teacher-student interaction. The dominant approach was still the transmission of content with behaviourist learning objectives in mind. By following instructions and absorbing content, students were able to become ‘competent’ in a particular discipline area.

Table 5 provides a summarised overview of Generation 3.

**Table 5:** Summary of Generation 3

<b>Period</b>	1956–1968
<b>Key features</b>	Multimedia, computer animation and computer-assisted learning, and telematics (telephony) – interactive content
<b>Pedagogy</b>	Behaviourism/cognitivism/constructivism
<b>Curriculum</b>	Curricula formulated in different disciplines and embedded in gender, class, caste, and race/tribal assumptions and relations. Mode 1 knowledge production
<b>Content owner</b>	University
<b>Interaction</b>	Mostly asynchronous with limited interaction – mass delivery of DE – computer-aided instruction – computer-assisted learning
<b>Medium</b>	Text, images, sound, video, instructional and live television
<b>Production</b>	Printing press, sound and video/film recording and computer design/programming
<b>Storage</b>	Recordings – audio cassettes and video cassettes – storage on disks
<b>Delivery</b>	Mail system/television/ telephone/computers/video and sound playback equipment – first computers used to send batches of data

## Fourth-generation DE

The emergence of online group communication and the sharing of resources were classified by Taylor (1995) and Lauzon and Moore (1989) as a *fourth* generation of DE.

Communication over computer networks was established by the early 1960s. Attempts at networking and communication continued and in 1969, the US government developed ARPANET (Advanced Research Projects Agency Network) as an experiment in multisite packet switching (dedicated telephone lines for data communication) (Harasim 1995, 6). The experiment attempted to link researchers with remote computer centres so that they could share hardware and software resources. Research participants soon realised that they could use these links to send messages to one another about their success and progress with projects. In the 1970s, these links between researchers and the process of interconnecting became the basis for the Internet, a worldwide ‘network of networks’ that links millions of people and tens of thousands of computer resources (Harasim 1995, 6).

In the early 1990s, the World Wide Web was developed by Sir Tim Berners Lee at CERN, the particle accelerator facility in Switzerland (Horton 2000, 5). The Web quickly became a graphical user interface for the valuable and complex resources of the Internet. Education and training centres became increasingly willing to use this application.

Fourth-generation DE is based on two-way communications technologies that allow for direct interaction between the teacher (who is seen as the originator of the instruction) and the remote student – and among remote students themselves. This form of DE aims to provide a more equal distribution of communication between student and teacher, and between students – relationships are formed in order to foster collective development (for example, the online learning community). In his later work, Peters (in Garrison 2000, 7) recognised the need to address teaching in that he introduced the concept of ‘social intercourse’.

Although there may be a need for independence among distance students, there is also an argument to be made for continuous interaction facilitated by the teacher. Holmberg (in Garrison 2000, 7), as a fourth-generation distance learning theorist, introduced the argument that although substantial conversation can be contained in pre-produced courses, continued communication between student and teacher is important. With sufficient communication and support, students should be able to construct knowledge together with facilitators and fellow students. The distance learning experience, or the ‘learning package’, should not be closed, thus preventing dialogue from fulfilling a constructive role. Knowledge construction, based on constructivist and social constructivist

learning philosophies, emerged as institutions experimented with collaborative learning and the online learning community. While Mode 1 knowledge remained the dominant mode of knowledge production, an increase in Mode 2 (problem-based) knowledge production (as proposed by Barnett 2004) was noticeable. Table 6 provides a summarised overview of Generation 4.

**Table 6:** Summary of Generation 4

<b>Period</b>	1969–2005
<b>Key features</b>	Video-conferencing, audio-graphics, the Internet and WWW – sharing of resources, asynchronous and live communication – integration of media and technology for multiple platforms (freedom to select) – student and teacher options
<b>Pedagogy</b>	Behaviourism/ cognitivism/ constructivism/ social constructivism or constructionism/ enactivism/ connectivism
<b>Curriculum</b>	While disciplines and university knowledge still remain paramount, open educational resources (OERs), the corporate university, and other sites of knowledge production are increasingly impacting on the curriculum. The curriculum is moving beyond Mode 1 and Mode 2 knowledge and morphing into Mode 3 knowledge
<b>Content owner</b>	Universities and global community (dominated by so-called First-World content)
<b>Interaction</b>	Content starting to move away from the university – asynchronous and synchronous interaction – mass delivery becomes problematic and demands for interaction challenge ICTs
<b>Medium</b>	Text, images, sound and video
<b>Delivery</b>	Mail system/television/ telephone/computers/video and sound playback – equipment – computers starting to become a generic device and WWW (Internet) as a generic platform

### Fifth-generation DE

Taylor (2001, 3) introduced his fifth generation of distance learning called *The Intelligent Flexible Learning Model*, claiming that it is based on intelligent technologies that are able to record conversations and then allow for reusability through automated response systems. Campus portals provide access to institutions' processes and resources. This functionality of current technologies makes it possible to reduce the level of interaction with students, meaning scalability and costs are positively affected. Annand (2004), writing from the distance learning context of the University of Athabasca, Canada, supports a

similar view of the fifth generation as encapsulating the latest solution to the support challenge.

The online communication developments, discussed above, which are full of promise and very seductive, only *partially* addressed the need for interaction between all learning stakeholders. The need for affordable mass delivery and communication is still a tremendous challenge in developing contexts like South Africa. The role of the university is under scrutiny (Barnett 2000) and DE, whether in a developing or developed context, needs to reconsider the way in which development in communication networks impacts on teaching and learning (Castells 2009). Open-source systems, as well as online and open content reduce the cost of producing materials, but raise other challenges, for example, the critical scrutiny of resources and careful integration into scaffolded learning experiences.

This generation of DE saw the first generation in which curriculum development and pedagogical practices became drivers of new approaches to teaching and learning. We acknowledge that advances in technology created the space for these developments, but emphasising only advances in technology impoverishes our understanding of the development of DE. Table 7 provides a summarised overview of Generation 5.

**Table 7:** Summary of Generation 5

<b>Period</b>	Present day
<b>Key features</b>	Video-conferencing, audio-graphics, the Internet and WWW – sharing of resources, asynchronous and live communication – integration of media and technology for multiple platforms (freedom to select) – learner and teacher options – the rise of Web 2 technologies
<b>Pedagogy</b>	Behaviourism/cognitivism/ constructivism/ social constructivism
<b>Curriculum</b>	As more and more knowledge producers (formal, informal and self-publishing) enter the market, the curricula increasingly become open and fluid. Open educational resources and the use of YouTube and other social technologies are changing the nature of knowledge, the curriculum and the validation of knowledge
<b>Content owner</b>	Universities and global community
<b>Interaction</b>	Content starting to move away from the university – asynchronous and synchronous interaction – mass delivery becomes problematic and demands for interaction challenge ICTs
<b>Medium</b>	Text, images, sound and video
<b>Production</b>	Printing press, sound and video/ film recording and computer design/ programming/user involvement

<b>Storage</b>	Digital storage media (CD, DVD, memory sticks, central servers, hard drives, etc.)
<b>Delivery</b>	Mail system/television/ telephone/computers/video and sound playback – equipment – computers starting to become a generic device and WWW (Internet) as a generic platform

## QUO VADIS?

As the flow of communication and information increases (Castells 2009) and the roles of the traditional producers of knowledge are increasingly questioned (Barnett 2000), higher education and DE (in particular) have to critically interrogate their own (often unquestioned) meta-narratives regarding the curriculum, teaching, learning and student support. Technological advances and the supercomplexities humanity faces, necessitate Mode 3 knowledge production in which ‘knowing the world is a matter of producing epistemological gaps’ and accepting that ‘knowing produces further uncertainty’ (Barnett 2004, 251). Cormier (2008) explores the impact of social technologies on curriculum development and suggests that social learning practices ‘are allowing for a more discursive rhizomatic approach to knowledge discovery’ which is ‘antigenealogy’ and in which the curriculum becomes ‘detachable, connectible, reversible, modifiable . . . [with] multiple entryways and exits’. Barnett (2000, 410) states that the university is no longer the only provider of knowledge in the world, and that the number of knowledges and truth-claims has multiplied. Barnett (2000, 410) also states that ‘the criteria for validating knowledge claims are widening’ and that ‘the means of validating knowledge claims are changing’ (see also Cormier 2008).

We acknowledge that while new developments in technologies do offer higher education increased opportunities to formulate proposals, such as those provided by Barnett (2000), technologies are not necessarily the saviour – especially in a developing world context. Student access to affordable technologies will, for some time to come, continue to impact on higher education’s (and more specifically DE’s) response to the challenges of the 21<sup>st</sup> century. The automation of student support (FAQs) and content, as suggested by Taylor (2001), cannot be accepted as sufficient progress towards the communication challenges faced by mass distance learning institutions. The support challenge remains prominent at an institution like Unisa, which facilitates learning for approximately 300 000 students, many of whom are underprepared students and under-resourced.

While technologies can assist in facilitating communication between institution and students and among students themselves, we should not underestimate the inherent possibilities for effective support present in the communities from

which students come. Alternative resources and support in students' respective communities can (and should) be investigated and harnessed to assist students in their endeavours. DE practitioners – especially in a developing world context – should not be led to believe that technology per se provides the solution to student success. Castells (2009), Siemens (2004) and others suggest an appraisal of social and communication networks as heuristic for rethinking learning and student support. A major issue for a possible future for mass delivery of open distance learning (ODL) in a developing context will have to be the shift away from content provision to the provision of activities and guidance/pathways, to sources of content already on the Web, impacting on the role of teachers and academics. The context will also determine the success of a future generation, as additional support will come from the community in order to contribute to affordability and efficiency in terms of teaching and support.

A new era will not be characterised by the duplication of best practices from mainly North-Atlantic contexts, but by DE institutions which develop agile context-appropriate responses. Snowden and Boone (2007) propose that leaders (in any field) should be careful to respond in non-nuanced ways by trying to duplicate 'best practices' in contexts far removed from the original context of application (see also Kahane 2010). These authors propose that decisions be made based on an analysis of the kind of complexity which the institution/management is facing – ranging from simple, complicated, complex to chaotic (Snowden and Boone 2007, 2). We are of the opinion, based on Barnett (2000) and Castells (2009), that the challenges facing DE and ODL will most probably range between the complicated, the complex and the chaotic, requiring different responses (Snowden and Boone 2007). Relying *only* on technology would be foolish.

We therefore propose that a future generation of DE will have to address context- and community-based student support and facilitation as its challenge within the broader context of redefining the purpose of higher education. We foresee future learning experiences encompassing the following:

- Students form part of peer collaborative groups and communities of practice, which they share with alumni, employers, community members and tutors;
- Institutions will have to design appropriate blended learning options in a menu of service from which students can tailor-make their learning experiences, to allow for maximum self-organisation of learning with support;
- Higher education institutions have, for too long, distanced themselves from the communities in which they themselves are located, and from which their students originate. Higher education will have to find creative ways to speak 'from place' and 'to place', from their specific location within the

broader network (consisting of communities, employers, families and other stakeholders);

- Giving students access to wireless and remote technologies through negotiation with providers;
- Learning is no longer content driven, but shaped and paced by activities- and inquiry-based learning, which is embedded in the current and future student, and in employment and societal contexts (as explored by Siemens 2004);
- Regional production facilitates the speedy distribution of learning materials;
- Making use of (and contributing to) generic and open content, which can be accessed from multiple platforms (all forms of smart devices).

## **(IN)CONCLUSIONS<sup>4</sup>**

The history of DE is embedded in larger, fluid discourses regarding the role of higher education. While DE was, for a large part of its history, fascinated with and even hypnotised by content and technology, the bigger picture requires a look at more challenges than just choosing the ‘right’ or latest technologies – other factors limit the suitability of these technologies in developing contexts (for example, affordability and access).

Earlier mass-production systems, focusing on content and texts, claimed to enable economies of scale in DE, but these economies are limited when communication has to be enabled, as only a certain number of students can be assigned to a facilitator (Heydenrych 2006). In this regard, new communication technologies – even if we disregard the problem of access – are a solution only in part, because at issue is the affordability of ‘human services’ to operate the technologies, in order to facilitate and mediate learning. Students are members of communities, both nationally and globally, and therefore members of particular communities can assist groups of students to gain knowledge and competency (i.e. students can learn from the community and apply new skills in their communities).

The future of distance education will be shaped by DE’s ability to engage innovatively with the communities of a variety of stakeholders, the strategic use of technologies and the acknowledgement that the supercomplexity we face will necessitate the search for good practices, shaped by and responding to specific contexts.

## NOTES

1. We concur with McEwan (2009) that the idea of ‘developing world’ versus ‘developed world’ is a contestable notion, especially within a postcolonial critique on the understanding of ‘development’. In this article we use the term ‘development’ within the context of its accepted use in the wider discourses in education.
2. Most international literature refers to ODL as ‘open *and* distance learning’, but the University of South Africa (Unisa) has opted for the term ‘open distance learning’. The authors acknowledge that there are increasingly different uses and combinations with open, distance and other foci like e-learning, as illustrated in the title: *European Journal of Open, Distance and E-learning*, <http://www.eurodl.org/> (accessed 7 May 2010).
3. See, for example, Lewis-Williams and Pearce (2004). Images on rocks and caves are furthermore not unique to Africa, but have been found on all continents.
4. We intentionally prefer the heading for this closing paragraph to be (in)conclusions.

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