Discussion Paper

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Workshop#1: Teaching and Learning in the Digital Age: Challenges and Opportunities

Prof. Narend Baijnath, Council on Higher Education, South Africa
Prof. Eva Cendon, FernUniversität in Hagen, Germany

Introduction

Teaching and learning form some of the core functions of institutions of higher education (HE). It is through teaching and learning that students are empowered with the necessary knowledge, competencies and a range of attributes that qualify them to be certified as graduates of their respective institutions. As McKenna (2016) has observed, teaching and learning are context-specific, and are thus influenced by the socio-cultural, economic, ideological, political, legal and technological environments within which institutions are located. These factors influence teaching and learning at various levels, ranging from the classroom, through institutional and national, to global levels. One of the factors that influences teaching and learning on a global scale is that of technological development (Dessus, Mandin, & Zampa, 2008). More specifically, advances in digital technologies tailor-made for educational purposes have had far-reaching influence on teaching and learning. Hitherto marginal communities not within easy geographical reach of universities are able to access them more simply and at lower cost. Universities are able to reach their students and support their learning in unprecedented ways; and higher education institutions (HEIs) are able to market their offerings across borders and reach large numbers of paying students – not practically possible prior to digitalisation. Clearly, a world of possibility now exists. These do not come without enormous implications and costs.

The objective of this short paper is to provide an overview of teaching and learning in the digital era. It unpacks what teaching and learning in the digital age entail and how they differ from traditional variants. It similarly presents a review of cases that represent the state of the art in teaching and learning in the digital era. It further explores the opportunities that teaching and learning in the digital era present, as well as the challenges or constraints that society has to confront in striving to institutionalise technology-based teaching and learning. It ends with recommendations for policy - a primary objective of the paper.

Unpacking Teaching and Learning in the Digital Age

The globalisation and internationalisation of national economies, alongside the rapid improvement in digital technologies, are unceasingly altering society's manner of living, working and learning (Voogt et al, 2013). Improvements in digital technologies have resulted in careers that did not exist in the previous era, paving ways for occupations that will exist in the not too distant future. Higher education institutions as the key role players in the development and production of skills had to rise to the challenge, and find means of equipping students with the

digital-age skills necessary for technologically driven labour markets and to face the attendant challenges ahead (Barber, Donnelly, & Rizvi, 2013).

In the light of these changes, lifelong learning has become a central paradigm and guiding principle. It shifts the focus from an institutional view to the learner and his or her learning, as life-long, life-wide, including non-formal, and informal learning processes. It stems from the premise that individuals need to update and enhance their skills and competencies throughout their lives and hence re-enter educational processes in different phases of their (working) lives. For higher education institutions, this means a shift from their traditional role of educating young students coming from schools to dealing with a wide range of students re-entering higher education at different phases of their lives. Within the paradigm of lifelong learning, learners are in focus: their different backgrounds and their learning pathways that bring them (back) to universities as lifelong learners. (Schuetze, 2014; Schuetze & Slowey, 2012) This requires a re-positioning of universities as institutions for lifelong learning and places the focus on teaching and learning in higher education to respond more flexibly to individual learners´ needs and changing market requirements. This re-positioning manifests in a differentiation of programs on multiple levels, as research or professional degrees, ranging from modules, certificates up to bachelors or masters programs and stackable credentials that allow students to leave higher education and return later, with their credits counting toward the next certificate or degree. Programs vary in their modes of delivery, providing options for part- time or full time study, aligning work and study in work-integrated or work-accompanying programs.

Digital technologies have supported teaching and learning by enabling different modes of delivery. Hence, the state of the art in teaching and learning in the digital age varies from class room-based teaching using digital technologies as teaching and learning aids to online learning where the entire teaching and learning processes take place through the media of digital technologies. In between the two, there are different types of blended teaching and learning where digital resources play a prominent role. These three (overlapping) categories form a continuum of teaching and learning in the digital age (Bates, 2015), classified as follows:

(a) *Classroom learning* using no (very rare) or just some technology aid.
(b) *Blended learning,* including a variety of designs from technology enhanced classroom learning, learning management systems as storage room for learning materials, to lectures captured as ‘flipped classrooms’, as models for alternating online and face-to-face learning in different shapes as ‘hybrid learning’.
(c) *Fully online learning,* as a form of distance learning with credit courses that cover the same content and assessment as campus-based courses, non-credit courses, fully open courses (as MOOCs) or Open Educational Resources (OER), available for free download for students and teachers.

Online teaching and learning is now a major activity for most academic departments in universities and colleges. Enrolments in fully online courses now constitute between a quarter and a third of all post-secondary enrolments in the USA (Allen & Seaman, 2014). Online learning enrolments have been increasing by between 10 and 20% per annum in the last 15 years in North America compared to an increase in campus-based enrolments of around 2 to

3% per annum (Bates, 2015). Some institutions are now developing plans to move a substantial part of their teaching into more blended or flexible modes. For instance, the University of Ottawa is planning to have at least 25% of its courses blended or hybrid within five years (University of Ottawa, 2013), the University of British Columbia is planning to redesign most of its first and second year large lecture classes into hybrid classes (Bates, 2015). However, as Power & Gould-Morven (2011) point out, many of these initiatives are administration-led and work with adjuncts or contract faculty while academics still deliver courses in traditional classrooms.

Whereas the different modes of delivery support students to learn according to their geographic locations, their learning styles and their time budgets, the respective pedagogy allows digital technologies to liberate their full potential for teaching and learning. Taking the diversity of students as lifelong learners and their learning in focus, constructivist approaches and student-centered learning have become policy-led core priorities redefining the respective roles of teachers in higher education (Attard, Di Ioio, Geven, & Santa, 2010; Redecker et al., 2011; Sursock, 2015). For online teaching in particular, special qualities and roles of teachers become necessary, exceeding the classical role of teaching and enriching it with designing and organizing learning experiences and encouraging and moderating discourse between students and students, teacher and students, and content resources (Anderson, 2008). Interaction becomes a central part (Akbar, 2016). With that the roles and designations of teachers are changing and broadening, ranging from e-moderators, to (group) facilitators, to resource persons and co-learners, enhanced by other functions supporting students with regard to technology issues (Brenton, 2009; Cutajar, 2016).

Challenges of teaching and learning in the Digital Age

Although digital technologies possess great potential in the service of effective teaching and learning, the pace of their adoption has been slow, especially so in the developing world, where infrastructure and costs are major factors. Furthermore, the effective use of digital technology in the lecture halls requires extra attention to digital skills for both the student and the lecturer, which incurs extra costs (Gulati, 2008, Pardue, & Morgan, 2008). Professional advancement of lecturers on the knowledge issues such as teaching strategies, instructional styles, student learning styles and alternative teaching strategies remain optional (Coetzee-Van Rooy, 2002). Clearly for systemic change based on the use of technology for teaching and learning and support of open learning, a more coordinated, strategic and policy driven approach is necessary (HFD, 2017; Miao, Mishra, & McGreal, 2016).

With regard to resources, challenges range from poor internet access and bandwidth, lack of infrastructure, to lack of qualified personnel for developing OER (UNESCO 2011; Miao et al. 2016, HFD 2016). This is also connected to issues of costs regarding balancing the initial costs involved in developing mechanisms, processes and procedures against anticipated or actual use of digital teaching and learning technologies (National Forum for the Enhancement of Teaching and Learning in Higher Education, 2015; Miao et al 2016). The ‘reusability paradox’ forms another issue – the more context a resource has, the less pedagogical value it has in

terms of re-use. While students need context to make learning meaningful, OER should have as little context as possible to enable their re-use (Wiley, 2007). Besides, research evidencing impact and supporting the perceived value and benefits of digital supported teaching and learning is missing (HFD 2016). Furthermore, questions regarding ownership and copyright and associated procedures remain big challenges, both on individual as on organizational level (HFD 2016).

With regard to teaching and learning practices, there are also challenges that make academics reluctant in adopting digital technologies. The integration of digital media in teaching and learning is a complex process of negotiation between different stakeholders within universities. Hence, university staff and especially academics as teachers are confronted with changing roles and qualification profiles. (HFD, 2016). Besides there are gaps in technology and digital literacy skills amongst staff that need to be addressed (Prensky, 2001). In addition, a reward or recognition system for publishing teaching and learning materials is still absent. Finally, there are concerns about the quality of OER due to the perception that free things are most often associated with low quality.

Opportunities offered by teaching and learning in the Digital Age

The afore-mentioned challenges may have hindered a broader adoption of digital technologies in the teaching and learning sector. However, these technological advances have the potential to bolster and restructure teaching and learning in higher education. Oliver & Chen (2002) pointed out that digital technologies offer prospects to modify education for students to learn in various ways and explore through different electronic and dynamic media, creating a far more interesting way of learning. Duderstadt et al (2002) noted that digital technologies offer ways to help students develop and maintain various types of communication. Digital technologies also promote a learner-centred environment by providing the tools for students to inquire and research topics for themselves (Czerniewicz, Ravjee, & Mlitwa, 2006).

According to Oliver & Chen (2002), the use of ICT allows for flexibility, and efficient delivery of learning. Technological change not only creates new virtual learning environments but also alters existing physical learning environments (HFD, 2016). Online teaching offers new, exciting opportunities to expand the learning environment for diverse student populations. E-learning permits the elaboration of personalized learning to help students develop higher level cognitive abilities. Willcox et al (2016) emphasize the facilitation for the teachers by blended learning as a “dynamic digital scaffold” (p. 24) synthesizing online and offline learning modalities. This hybridization enables teachers to “improve instruction at scale by personalizing the students´ learning experiences” (ibid.) Digitalisation thus supports the teacher to concentrate on his/her unique contribution to learning by providing context and acting as mentors and to foster reflection can contribute to the improvement of HE teaching (HFD, 2016). Furthermore, online teaching and learning promotes greater collaboration between researchers, lecturers, teachers and students. Digital teaching and learning practices facilitate the co-creation of knowledge between lecturer and students and simplifies the process of revising, updating and changing

content. This makes learning amenable to customisation to suit specific contexts; and increase collaboration between institutions; hence, reducing the 'silo-effect'. In addition, through digital teaching and learning new target groups can be reached (HFD, 2016).

Policy tracks: Channels and strategies for change

Resolute policy development and implementation, speaking to both resourcing and educational practices, is a key factor that could facilitate and promote a high rate of adoption of digital technologies in teaching and learning in higher education. Policies are required at national as well as on institutional levels. (Yuan et al, 2008; Willcox et al, 2016; HFD, 2017). There follows a distillation of the main issues that such policies should address:

At national level:

- Prioritisation of digital literacies as basic skills with long range targets and milestones for transiting to an optimal positioning in digitalisation in higher education;
- Building/expanding infrastructure for digital teaching and learning practices;
- Funding initiatives to promote, develop and distribute digital learning resources on scale;
- Promoting the development and the value of teaching in higher education through digital technologies;
- Establishing a legal framework for digital teaching (teaching load, data protection, copyright…);
- Encouragement of cooperation and collaboration among institutions in the area of teaching and learning using digital resources to amortize costs, include joint offering of online courses and/or MOOCs;
- Creation of thinking communities (Willcox et al, 2016) that continuously evaluate new practices across universities.

Strategies at institutional level:

- Initiating digitalisation strategy and change processes supported by clear policies and plans;
- Active raising of HEI profiles in their use of digital technologies;
- Expanding further education, flexible study models and new services through appropriate use of digital technologies ;
- Strategically combining internationalization and digitalization in academic programmes;
- Using digital media to increase visibility and attractiveness of HEIs;
- Joining forces through cooperation with other HEIs.

Shaping at institutional level:

- Consolidating IT systems, inspecting cloud solutions and forming new consortia;
- Investing in support structures;
- Setting up points of contact for legal questions;
- Building structures for support staff (e.g. the "learning engineer" (Willcox et al, 2016);

- Developing new and differentiated roles for teachers in the digital age with enabling policy;
- Implementing incentives for digital teaching;
- Designing new learning spaces and learning environments so that students can learn anywhere, anytime and at their own pace;
- Identification of change agents and role models for implementing new ways of teaching and learning.

Conclusion

The value and impact of digital technologies on teaching and learning are incontrovertible. The central challenges are to weave together the possibilities through infrastructure development, capacity development, appropriate policies at the national and institutional levels, and materials development and harvesting from the vast array of open resources available to create the greatest advantage for institutions, teachers and students so that graduates are optimally prepared for the digital age. Policy development must begin at the national level, resonate at the institutional level, and then find expression in detailed policies, plans and resource allocation for optimal success.

References

Akbar, M. (2016). Digital Technology Shaping Teaching Practices in Higher Education. *Frontiers in ICT*, *3*. https://doi.org/10.3389/fict.2016.00001

Allen, I. E., & Seaman, J. (2014). *Opening the Curriculum: Open Educational Resources in US Higher Education, 2014*. Babson Survey Research Group

Anderson, T. (2008). Teaching in an online learning context. In T. Anderson (Ed.), *The theory and practice of online learning* (2nd ed). Edmonton, AB: AU Press.

Attard, A., Di Ioio, E., Geven, K., & Santa, R. (2010). *Student Centered Learning. An Insight Into Theory And Practice*. Bucharest. Retrieved from http://media.ehea.info/file/ESU/07/4/2010-T4SCL_An_Insight_Into_Theory_And_Practice_565074.pdf

Barber, M., Donnelly, K., & Rizvi, S. (2013). An Avalanche is Coming: Higher Education and the Revolution Ahead. (p. 72). London: Institute for Public Policy Research. Retrieved from http://www.ippr.org/images/media/files/publication/2013/03/avalanche-is-coming_Mar2013_10432.pdf

Bates, A. W. (2015) Teaching in a Digital Age, Ontario: Creative Commons

Brenton, S. (2009). E-learning – an introduction. In H. Fry, S. Ketteridge, & S. Marshall (Eds.), *A handbook for teaching and learning in higher education: enhancing academic practice* (3rd ed, pp. 85–98). New York ; London: Routledge.

Coetzee-Van Rooy, A. S. (2002). Perceptions of quality teaching and learning as indicators for staff development aimed at experienced academics. *South African Journal of Higher Education*, 16(1), 122-135.

Cutajar, M. (2016). Qualitative differences in students' perceptions of others in a networked learning environment. In S. Cranmer, N. B. Dohn, M. de Laat, T. Ryberg, & J.-A. Sime (Eds.), *Proceedings of the 10th International Conference on Networked Learning 2016* (pp. 472–480). Lancaster. Retrieved from http://www.networkedlearningconference.org.uk/abstracts/pdf/P53.pdf

Czerniewicz, L., Ravjee, N., & Mlitwa, N. (2006). ICTs and the South African higher education landscape.

Dessus, P., Mandin, S. and Zampa, V. (2008). What is Teaching: Cognitive-based Tutorial Principles for the Design of a Learning Environment, In Tazi, S and Zreik, K (Eds) Common Innovations in E-Learning, Machine-Learning and Humanoid. Paris: EEE Europa, pp 49 - 55

Duderstadt, J. J., Atkins, D. E., & Van Houweling, D. E. (2002). Higher education in the digital age: Technology issues and strategies for American colleges and universities. Greenwood Publishing Group.

Gulati, S. (2008). Technology-enhanced learning in developing nations: A review. *The International Review of Research in Open and Distributed Learning*, *9*(1).

HFD. (2016). Discussion Paper. 20 Theses on Digital Teaching and Learning in Higher Education (Working Paper No. 18). Berlin: The German Forum for Higher Education in the Digital Age. Retrieved from https://hochschulforumdigitalisierung.de/sites/default/files/dateien/HFD_AP_Nr_18_Discussion_Paper.pdf

HFD. (2017). The Digital Turn – Pathways for Higher Education in the Digital Age. (Arbeitspapier No. 30). Berlin: Hochschulforum Digitalisierung. Retrieved from https://hochschulforumdigitalisierung.de/sites/default/files/downloads/HFD_Final_Report_English.pdf

McKenna, S. (2016), Teaching and Learning, Chapter 4 in Council on Higher Education (CHE). South Africa Higher education Reviewed: Two Decades of Democracy. Pretoria: CHE, pp 144 - 191

Miao, F., Mishra, S., & McGreal, R. (Eds.). (2016). *Open Educational Resources: Policy, Costs and Transformation*. UNESCO and Commonwealth of Learning. Retrieved from http://unesdoc.unesco.org/images/0024/002443/244365e.pdf

National Forum for the Enhancement of Teaching and Learning in Higher Education (2015) *Learning Resources and Open Access in Higher Education Institutions in Ireland* Focused Research Report No. 1.

Oliver, J., & Chen, J. (2002). Use of signature analysis to discriminate digital printing technologies. In *NIP & Digital Fabrication Conference* (Vol. 2002, No. 1, pp. 218-222). Society for Imaging Science and Technology.

Pardue, K. T., & Morgan, P. (2008). Millennials considered: A new generation, new approaches, and implications for nursing education. *Nursing education perspectives*, *29*(2), 74-79.

Power, M., & Gould, A. (2011). Head of Gold, Feet of Clay: The Online Learning Paradox. *International Review of Research in Open and Distance Learning*, *12*. https://doi.org/10.19173/irrodl.v12i2.916

Prensky, M. (2001). Digital natives, digital immigrants part 1. On the horizon, 9(5), 1-6.

Redecker, C., Leis, M., Leendertse, M., Punie, Y., Gijsbers, G., Kirschner, P., Stoyanov, S., & Hoogveld, B. (2011). *The future of learning: preparing for change.* Luxembourg: Publications Office of the European Union. Retrieved from http://dx.publications.europa.eu/10.2791/64117

Schuetze, H. G. (2014). From Adults to Non-Traditional Students to Lifelong Learners in Higher Education: Changing Contexts and Perspectives. *Journal of Adult and Continuing Education*, *20*(2), 37–55. https://doi.org/10.7227/JACE.20.2.4

Schuetze, H. G., & Slowey, M. (Eds.). (2012). *Global Perspectives on Higher Education and Lifelong Learners*. New York: Routledge.

Sursock, A. (2015). *Trends 2015: Learning and Teaching in European Universities*. Brussels: European University Association. Retrieved from http://www.eua.be/Libraries/publications-homepage-list/EUA_Trends_2015_web

UNESCO (2011). 'Building Human Capacities in Least Developed Countries to Promote Poverty Eradication and Sustainable Development' from http://unesdoc.unesco.org/images/0019/001915/191597e.pdf

University of Ottawa (2013). *Report of the e-Learning Working Group*. Ottawa ON: University of Ottawa

Voogt, J., Erstad, O., Dede, C., & Mishra, P. (2013). Challenges to learning and schooling in the digital networked world of the 21st century. Journal of computer assisted learning, 29(5), 403-413.

Wiley, D. (2007). 'On the Sustainability of Open Educational Resource Initiatives in Higher Education' OECD's Centre for Educational Research and Innovation. Retrieved from http://www.oecd.org/edu/ceri/38645447.pdf

Willcox, K. E., Sarma, S., & Lippel, P. H. (2016). Online Education: A Catalyst for Higher Education Reforms. Massachusetts: Massachusetts Institute of Technology. Retrieved from https://oepi.mit.edu/files/2016/09/MIT-Online-Education-Policy-Initiative-April-2016.pdf

Yuan, L., Macneill, S. & Kraan, W. (2008) 'Open educational resources: Opportunities and challenges for higher education' in Educational Cybernetics Reports – Paper 1.