

# Emerging Trends in Higher Education Pedagogy

*Edited by*  
Santhiram Raman

 **WOU Press**



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# Foreword

## The Making of a “New” Instructor

The classroom we inhabit today is both a challenged and challenging environment. One reason it is challenged is the changing focus of the environment which has shifted from us, the teachers, to them, the learners; it is challenging because most of us who populate it as professors, associates and assistants are confronted by them who are not only well informed but often are better informed, simply because of their access to technologies, abilities in using the technologies rapidly and smartly, and perhaps most importantly, their capacities to source, share and disseminate current information rapidly amongst their peers.

The roundtable is about the capacity building of the teaching fraternity to work in today’s lecture halls and theatres, not just as purveyors of content but also, at the same time, as pilots and navigators of the young knowledge explorers entrusted to you. It is also likely that, within your professional lifetime, many of you will be working in classrooms that are figured far differently from the ones that you presently function in. For instance, large lecture halls may be a thing of the past, except for ceremonial events. With new instructional models, every classroom may be reconfigured for charging tablets and connecting USB ports. Likely, classrooms rich with interactive whiteboards, document cameras and lecture capture systems will support active learning environments. Telepresence systems, video and web conferencing expand classroom walls in online or distance learning scenarios to include participants from anywhere in the world. In a flipped classroom, students can learn at their own pace, equipped with notebooks, tablets and smartphones, using classroom extensions that can be accessed at any time, and from any place. Adding network access and digital projectors to classrooms encourage the use of interactive content. New technology provides the means through which new instructional models take hold and flourish.

I recollect, as faculty at USM in the early seventies, when life was a lot simpler, staff induction arrangements began with a simple mantra i.e., faculties teach and students learn. Our inductors then walked us through classroom management, security and safety issues, lesson notes and handouts, use of overhead projectors and transparencies, exams and assessment rules. The library and its resources were as near as you can get to learning materials, and prescribed textbook or books were a critical part of that environment. However, life is no longer simple and the changing demands and nature of instruction is not just a matter of the inclusion of technology. The nature of instruction, behaviour of instructors and expectations of the quality of instruction have all been changing. These issues require both reflection as well as serious consideration, on the “teaching” styles of instructors. Not too long ago, Tsisana Palmer, an ESL instructor and a member of the EDUTOPIA community, shared her insight as to what is required of and from her as an instructor<sup>1</sup>. A few questions arising from those insights resonate well with me and let me share these with you.

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<sup>1</sup> <http://www.edutopia.org/discussion/15-characteristics-21st-century-teacher>

**1. How prepared are our instructors to function in learner-centered classrooms and support personalised instructions?**

The digital natives who are increasingly populating today's classrooms have access to any information possible. They do not require us to "spoon-feed" them. Instead what may be more helpful is to support them as they journey through the WWW and help them identify those resources that meet their needs. As students have different personalities, goals and needs, offering personalised instructions is not only just possible but also desirable. When students are allowed to make their own choices, they own their learning, increase intrinsic motivation and put in more effort — an ideal recipe for better learning outcomes!

**2. How receptive are our instructors to engaging students not just as consumers but also as producers of content?**

It is likely that almost all of today's students own a smart phone and laptop of sorts. Tablets are also becoming a must-own gadget but the sadness in having these gadgets is ownership but use. Usage hardly goes beyond communicating with family and friends via chat, text or calls. Even though students are now viewed as digital natives, many are far from producing any digital content. While they do own expensive devices with capabilities to produce blogs, infographics, books, how-to videos, and tutorials, just to name a few, in many classes, they are still asked to turn those devices off and work with handouts and worksheets. Sadly often times, these papers are simply thrown away once they are graded. Many students do not even want to have anything to do with them, let alone keep or return to them later. However, if guided, helped and given a chance, students can produce beautiful and creative blogs, movies, or digital stories that they feel proud of and share with others. These may in fact be one of the most important tasks today's instructors should do.

**3. How prepared are our instructors to continuously learn new technologies?**

In order to be able to offer students choices, having one's own hands-on experience and expertise will be useful. Since technology keeps developing, learning a tool once and for all is not an option. The good news is that new technologies are new for the novice and experienced teachers alike, so everyone can jump in at any time! While the cost of owning the very latest gadget is expensive, many software programmes and platforms are free and versions of these sit comfortably with older hardware as well. It is to the advantage of instructors to join communities of practitioners to keep up with trending practices.

**4. Can our instructors smarten up using smart phones?**

Whether we accept it or not, smart phones are a part and parcel of our everyday existence. Instructors, despite their inhibitions about smartphones in the classrooms, should encourage students to view their devices as valuable tools that support knowledge (rather than as distractions), and assist them in using them as such. With the plethora of available search engines at their disposal, students can look for specific bits of information unique to their needs without distracting their peers' time — different students have different needs when it comes to say, help with new vocabulary or questions; therefore, there is no need to waste time and explain something that perhaps only one or two students

would benefit from. Instead, teaching students to be independent and know how to find answers they need to make the class a different environment! In such a situation, students become contributors to classroom dialogues.

#### 5. **Can our instructors blog?**

For any instructor, to blog or not to blog should not be a question anymore! The question is how effectively the blogosphere can support the conversations in the classroom. Social media is a big thing. Peer-to-peer learning is effective and appropriately constructed blogs can lead to active debate and dialogue; and if instructors can channel the discussion cleverly, learning becomes interesting, engaging and fun.

#### 6. **Can our instructors create their own website by going digital?**

Another important attribute is to go paperless — organising teaching resources and activities on one's own website and integrating technology in bringing students' learning experience to a different level. Sharing links and offering digital discussions as opposed to a constant paper flow allows students to access and share class resources in a more organised fashion.

#### 7. **Can instructors develop skills to engage in project-based learning?**

As today's students have access to authentic resources on the web, experts anywhere in the world and peers learning the same subject somewhere else, teaching with textbooks is very "20<sup>th</sup>-century" (when the previously listed options were not available). Today's students should develop their own driving questions, conduct their research, contact experts, and create final projects to share all, using devices already in their hands. All they need from their teacher is guidance!

While all of the abovementioned techniques and technologies help create a much more exciting classroom, they at the same time are also useful tools to develop an instructor's own capacities and professional development. Some ideas that are worthy of exploration include the following.

#### 8. **Learn to use Twitter Chat**

Participating in Twitter Chat is the cheapest and most efficient way to organise one's own professional development, share research and ideas, and stay current with issues and updates in the field. We can grow professionally and expand our knowledge through great conversations happening every day, and going to conferences is no longer the only way to meet others and build professional learning networks.

#### 9. **Learn to connect**

Connect with like-minded individuals. Again, today's tools allow us to connect with anyone, anywhere and anytime. Do you have a question for an expert or colleague? Simply connect via social media: follow, join, ask or tell!

### 10. Learn to collaborate

Technology allows collaboration between teachers and students. Creating digital resources, presentations, and projects together with other educators and students will make classroom activities resemble the real world. Collaboration should go beyond sharing documents via email or creating PowerPoint presentations. Many great ideas never go beyond a conversation or paper copy, which is a great loss! Collaboration globally can change our entire experience!

### 11. Learn to build your positive digital footprint

It might sound obvious, but it is for today's teachers to model how to appropriately use social media, how to produce and publish valuable content, and how to create shareable resources. Even though it's true that teachers are people, and they want to use social media and post their pictures and thoughts, we cannot ask our students not to do inappropriate things online if we ourselves do it. Maintaining professional behaviour both in class and online, will help build positive digital footprint and model appropriate actions for students.

### 12. Learn to code

While this one might sound complicated, coding is nothing but today's literacy. As pencils or pens were the tools" of the 20<sup>th</sup> century, making it impossible to picture a teacher not capable to operate with it, today's teacher must be able to operate with today's pen and pencil, i.e., computers. Coding is very interesting to learn — the feeling of writing a page with HTML is amazing! There are some interesting online guides that provide help.

### 13. Don't hesitate to innovate

As instructors, we have today a whole range of assets available to us at a personal level, besides those made available through our institutions. We have the opportunity to create and expand our personal teaching toolkits. Open Educational Resources (OER), Massive Open Online Courses (MOOCs), hundreds of YouTube videos including those presented as TED talks, are some that come immediately to mind. Instructors need to be creative, committed and passionate about their profession and their role. These would mean that at the minimum, many of you who are at this roundtable, in your capacities as "trainers" of new instructors coming to your colleges and universities have a key role to play in the making of a "new" instructor equipped to make their classrooms engaging, exciting and enriching. As new pedagogies and new technologies keep emerging, discarding old ways and adapting to new ways becomes essential.

Tan Sri Emeritus Professor Gajaraj Dhanarajan  
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# Introduction

This collection of papers on the broad theme of “Emerging Trends in Higher Education Pedagogy: Innovative Learning Environments in Higher Education” aims to review the thinking and research done in the area of higher education pedagogy. The papers were given at a Roundtable Workshop entitled “Emerging Trends in Higher Education Pedagogy” that the School of Education, Languages and Communications organised on the 25<sup>th</sup> and 26<sup>th</sup> of February 2016, to bring together a group of experts to explore new forms of teaching, learning and assessment for an interactive world. It is hoped that these new forms will provoke major shifts in educational practice among practitioners, particularly in tertiary education.

Higher education institutions are facing new challenges especially in this age of rapid technological changes and adoption in this sector. Educators need to face and address today’s higher education learning landscape offering new insights, fresh ideas and learning experiences from different educator perspectives.

Ancient pedagogies which started off as a “sage on the stage” and moved on to a small set of basic teaching methods (instruction, discovery and inquiry) have been extended to become a profusion of pedagogies and their interaction with their own philosophical and pedagogical theories.

The future for education is seen as hugely dynamic and mobile. Knowledge comes from reflection and contemplation. The engine for learning is a continuous cycle of engagement and reflection. With the advent of social or participatory web, it has enabled users to participate actively in knowledge building. The principles of active production, collaboration, sharing, publishing and social bookmarking have been transferred to education.

Smart classrooms are equipped with the latest in wireless connectivity, interactive SMART boards, audio, video and educational technology not having access to keyboards to support writing assignments.

Are our educators in institutions of higher learning able to keep pace of these developments which are seen as hugely dynamic and mobile, and incorporate them in their teaching interactions with the students? The best way for universities to stay relevant is to innovate and introduce dynamic and new methods of teaching.

Innovative pedagogies have been defined as “theories and pedagogies and practices of teaching, learning and assessment for the modern technology enabled world.” (Sharples, M et al. 2015). Six leading experts in this field, Prof. Mohandas Menon, Assoc. Prof. Beena Giridharan, Prof. Glenda Grosling, Assoc. Prof. Lucy Bailey, Ms. Vanitha Ponnusamy and Prof. Madhulika Kaushik presented papers on various innovative aspects of higher education pedagogy as defined above and led in the workshop discussions that followed.

The second half of the 20<sup>th</sup> century saw cognitive paradigm and constructivist schools of psychology, putting more influence in higher education pedagogy leading to the emergence of the new theory of andragogy specifically for adult education. New theoretical principles and their

applications emerging out of both physical and social or behavioural sciences have impacted the development of several pedagogical and andragogical practices, and these practices have made a difference in the quality of the teaching-learning process. Mohandas Menon examines how the applications of ICT and the availability of a digital environment has led to innovative practices such as OERs, OEPs, social media and MOOCs, and made it possible to improve the quality and increase access of higher education. Here, Mohandas is also revisiting the theoretical base of the learning processes that these practices have created based on the existing theoretical positions about learning.

Beena Giridharan's paper provides an incremental and robust professional development programme that incorporates continuous professional development that encourages academics to embrace learning and teaching approaches that have sound pedagogical foundations and address learner needs. Reporting on initiatives taken at Curtin University, Sarawak, the paper focuses on the latest advancements in professional practice in higher education, and highlights the gains and challenges of faculty development programmes that influence pedagogical approaches and impact student success. It discusses initiatives taken to support academics through teaching and learning inductions followed by the Foundations of Learning and Teaching programme. This programme articulates into a range of specialist professional learning programmes supporting Transforming Learning at Curtin which encourage scholarship for teaching and learning.

One outcome resulting from the change in the demography of students going into higher education has been that institutions now need to focus on students and their learning, rather than mainly on teaching processes and the syllabi. Within this context, it is now understood that the assessment of student learning plays a powerful role in higher education studies. Not only is it a means through which students can be guided as to appropriate approaches for their study, but it is also seen to drive student learning. While assessment enables students' levels of achievement in a subject to be gauged and recorded through summative means, it is also an extremely effective way to develop students' understanding of their subjects through formative assessment feedback. Glenda Crosling's paper discusses the major role of assessment in student learning, sound design approaches, and ways that assessment can be structured to recognise student diversity and prepare students for success in the world of the 21<sup>st</sup> century.

Lucy Bailey and Vanitha Ponnusamy report on a range of initiatives that have been undertaken at the University of Nottingham, Malaysia Campus in order to enhance student involvement in teaching and learning processes. The three initiatives discussed here are:

1. Student observers of teaching
2. Student mentoring
3. Students as change agents

The data collected from students and lecturers regarding "student observers of teaching", illustrate the perceived benefits to both parties of student involvement. The authors also describe some of the challenges involved in implementing these changes and how they were addressed. Madhulika Kaushik discusses the advent of technology-supported pedagogy and its pervasive influence on matters related to education. The majority of our higher education institutions were built for the learning needs and behaviours premised on the requirements of the Industrial Age rather than the Digital Age. The affordances provided by technology, in terms of improved

access, lower costs, interactivity and the possibility of improved quality, and the rapid changing nature of the learner populations are forcing academics and education technologists to evolve pedagogies and learner support applications with a better fit with the evolving times.

This paper presents the trends in technology-supported teaching learning processes and the approaches used in higher education institutions to add value to the knowledge creation, curation, distribution and sharing with their learners, as well as to support learners through their academic life with the institution. As the World Wide Web and fast paced networks make ubiquitous learning a very real possibility, digital scholarship on an individual basis with learners taking different courses from a variety of providers is a trend that is developing fast. Online learning, flexible learning, mobile learning, OERs and MOOCs, collaborative platforms supporting peer-to-peer learning and co-creation of knowledge, supported by learning analytics are some of the interesting developments of our time that could lead to transformational changes in the way higher education institutions conduct their core activity and view the scope of their markets. As the changes in pedagogy approaches are becoming visible, accreditation, assessment and widely accepted certification remain thorny. The paper also briefly looks at the implications of the technology-supported pedagogies for users and stakeholders.

## Conclusion

It is apt to conclude with a quote from Arnoud De Meyer who talks about what the future holds for the educators and students of institutions of higher education:

“We are moving from a teaching paradigm towards a student-centered learning paradigm..... Our role evolves towards that of a guide and facilitator: a guide to help the students make the difference between the good, the bad and the ugly information; a facilitator to help make sense out of the overload of information available at our fingertips. As a consequence, the initiative for designing a curriculum may well shift a bit from the academic supplier to the student user. The new learning paradigm will no doubt be more experience-based. Project-based learning as a subcategory of experiences-based learning is not new. The simple idea to start from a real as opposed to a stylised problem, and have the students learn from the experience they build up in solving these problems, will get more applications in other disciplines. Related to this is the concept of the flipped classroom where we let the students learn from the conceptual frameworks outside the classroom, thus freeing up time in the classroom to apply concepts by solving problems, debating applications, and so on. This may not sound revolutionary to those of us who have been teaching by the case study method for example. The change is no doubt in the richness of what can be done outside the classroom through rich media and social networking. “Going to the classroom” will be less identified with spending time in a well-defined and constrained physical location. The classroom has become virtual and may exist everywhere and at all times of the day.” (Arnoud De Meyer 2016, 313-319)

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Sharples, M, Adams, A, Alozie, N, Ferguson, R, FitzGerald, E, Gaved, M, McAndrew, P, Means, B, Remold, J, Rienties, B, Roschelle, J, Vogt, K, Whitelock, D and Yarnall, L (2015) *Innovating Pedagogy 2015*, Open University Innovation Report 4, Milton Keynes: The Open University.

# Chapter 1 Higher Education Pedagogy: Theoretical Basis for Developments in Practice

~ Professor Dr. Mohandas Menon

## Introduction

Teaching and learning have been inherent in the life of humans since the start of their existence as parents. Teaching children came naturally to them. With the emergence of community, society and the civilisation, the organisation of teaching-learning became ordered but more informal in a family-based environment. People in ancient times often learned through observation and participation in everyday life of their respective communities and families. Learning occurs through interactive processes relative to one's culture and community. While the sociologists called these processes within the agencies of family and community as socialisation, educationists considered these as informal learning processes. This article attempts to examine the development of or understanding about teaching and learning not in general, but with a focus on higher learning or higher education.

Higher education or third level (tertiary) education is an optional final stage of education that occurs after primary, secondary and post-secondary levels. Teaching and learning in higher education has gone through considerable changes since the time of the ancient and medieval universities. Later with the emergence of the concept and practices of a societal system, it evolved into organised efforts made by specialised agencies of the society viz. schools, colleges and universities. Teaching has over several centuries of development transformed from a simple educational function into a complex profession. It is seen today as a very specialised function involving pedagogic principles and practices designed to provide unique service to meet the educational needs of the individual and of society. Initially the pedagogic principles and practices were mainly based on casual observations to more organised observations, and generalisation of experiences, and later based on philosophical and psychological postulates and theories that emerged during the last two millennia. This article attempts to trace the development of pedagogy in higher education since the ancient period to today's digital era.

## Scope and Approach of the Review

The paper tries to capture the major pedagogic developments based on philosophical perspectives and socio-psychological postulates and theories that led to today's understanding of the learner and learning, as well as teaching-learning processes at different age levels in higher education. It also attempts to review the external factors emerging from the influence of the changing socio-cultural environment in society as well as progresses in science and technology including the industrial revolution and the fast changing scenarios in the modern and postmodern periods that led to remarkable ongoing transformation of teaching-learning environment.

While the emphasis here is on the theoretical basis for pedagogical development, the context will be confined to higher education. The methodology adopted is a historical analysis based on secondary data obtained from selected sources from available literature to see how different philosophical postulates and theoretical propositions have contributed to the development of pedagogical principles that underlie good teaching-learning models and practices in higher education. It also reviews major landmarks in the history of science and technology that led to critical changes in the mode of instructional organisation. The canvas for this academic exercise is no doubt very vast, however the literature included in this analysis is no way exhaustive that could be demanded for a thorough historical research. The purpose is limited, hence the paper, taking into account the constraints of space, will not be able to go deep into the higher educational theory and practices during different times in the 2000 years history of education, emerging from different cultural backgrounds and influenced by different societal developments and critical landmarks.

## Pedagogic Thoughts and Practices

Pedagogy may be commonly defined as the art and science (and maybe even craft) of teaching. However, viewing pedagogy in this way fails to honour the historical experience and connect crucial areas of theory and practice. To understand the term fully, it needs to be explored through the thinking and practice of those educators who look to accompany learners, care for and about them, and bring learning into life (Encyclopedia Britannica 2015). Teaching is just one aspect of their practice. In recent years, there has been more intense and wider discussions on this term perceived from different directions. Paulo Freire, for instance, has been seeking a “pedagogy of the oppressed” or “critical pedagogy” and has proposed a pedagogy with a new relationship between teacher, student and society. As a result of the broader debates on pedagogy, practitioners have been wanting to rework the boundaries of care and education via the idea of social pedagogy; and perhaps most significantly, governments wanting to constrain the activities of teachers by requiring adherence to preferred “pedagogies” (Smith 2012).

This section provides a time line covered for this historical review which provides only a bird’s eye view of development in higher education during ancient, medieval and early modern periods. More emphasis is given to principles and theoretical schools of thought emerged during the late modern, postmodern and in the new millennium, covering the developments during and after the industrial revolution starting from late eighteenth century till to date.

Ancient Cultures (from 16 <sup>th</sup> century B.C. to 1285 A.D.)	Teaching-Learning methods/Pedagogy
<p>Ancient Greece (8<sup>th</sup> to 6<sup>th</sup> century B.C. to 600 A.D., into the beginning of the early middle ages).</p> <p>Rome, Hebrew culture, etc. (5<sup>th</sup> century to 1300 B.C.)</p> <p>Aristotle’s School (built at 350 B.C. and later)</p> <p>Plato’s Academy (founded in 387 B.C.)</p> <p>(<a href="http://ancientgreekeducation.weebly.com/">http://ancientgreekeducation.weebly.com/</a> and <a href="http://www-history.mcs.st-and.ac.uk/Societies/Plato.html">http://www-history.mcs.st-and.ac.uk/Societies/Plato.html</a>)</p>	<p>The distinction between teachers and pedagogues, instruction and guidance.</p> <p>Pedagogues (paidagōgus): Moral supervision by the pedagogue was significant in terms of status.</p> <p>Subject Teachers (didáskalos) Teaching methods based on reading and oral learning, and conducted through repetition. Teaching, especially in rabbinic schools, also included debate and practice.</p> <p>Encouraged an exploratory learning process where teachers and students were co-travellers in a search for truth. The teaching methods used reasoning and questioning. Nothing was labelled as the final answer.</p> <p>(Young 1987; Longenecker 1983: 53; Smith 2006:201)</p>
<p>Education in the Vedic period.</p> <p>Universities in Ancient Indian subcontinent – beginning 8<sup>th</sup> century B.C. and developing into ancient Indian universities (Nalanda, Taxila, Vikramshila, etc.)</p> <p>4<sup>th</sup> century to the close of the 8<sup>th</sup> century, under the Guptas and Harsha and their successors, is a remarkable period in India – age of the universities.</p>	<p>Memorisation with stress on pronunciation.</p> <p>Focus on critical analysis and comprehension.</p> <p>Contemplative pedagogy:            Sravana: listening to the teachings            Manana: reflection on the teachings            Nididhyāsana: the stage of meditation on the truth</p> <p>Storytelling question and answer method.</p> <p>Hands-on method.</p> <p>Seminars.</p> <p>Catechism—the pupil asking questions and the teacher discoursing at length on the topics referred to him.</p>

<p>Chinese region.</p> <p>Taixue (Imperial College) or Guozijian (Imperial Academy).</p> <p>Shang Dynasty (16<sup>th</sup> century B.C. - 11<sup>th</sup> century B.C.), Western Zhou Dynasty (11<sup>th</sup> century B.C. - 771 B.C.), Sui Dynasty (589 - 618) to the last feudal dynasty, Qing Dynasty (1644 - 1911).</p>	<p>Confucian thoughts: humanism, harmony and hierarchy, benevolence (ren), righteousness (yi), wisdom (zhi), loyalty (zhong) and altruism (shu).</p> <p>A good teacher must be a good moral exemplar.</p> <p>Education should be open to all (role modelling).</p> <p>Oral instruction and teaching by example were the chief methods of education. The molding of character was a primary aim of education.</p>
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**Table 1** Pedagogic principles and practices — Ancient period

## Education in the Ancient Period

It is difficult to argue that ancient history is the foundation of our modern-day educational system. During the period from 610 B.C. to 1285 A.D., many cultures, countries, dynasties and religions including Greece, Roman, Hebrew, Hindu, Buddhist, Muslim, and Christian cultures had commonalities and disparities in their educational thoughts and practices. However, they all contributed in providing certain pedagogical principles and processes that provided positive educational prospects for the future. This section discusses mainly the pedagogical thoughts and practices in the educational systems of European region (Greek, Roman, Hebrew), Indian subcontinent and Chinese cultures. During the period from 610 B.C. to 1285 A.D., several cultures, countries, dynasties, and religions provided several commonalities and disparities. This analysis discusses the educational systems of these countries. In addition to the commonalities and disparities, the discussion included the reasons they existed and certain elements that provided positive educational possibilities for the future. Building on past successes and producing creative solutions for current problems enables us to improve our educational system, one problem at a time (Klein 2010). **Table 1** presents a summary of the prominent pedagogical practices based on the philosophical positions regarding education in the three major cultures/regions during ancient times.

## Education in Medieval Period

With the decline of the Roman Empire, most of the educational institutes of Romans ceased to offer their services. Gradually, education ceased to be the main concern anymore and fighting skills became more important. Most of the rulers and politicians of this historical time gained power either through wars or inheritance while education played a little or no role in their success. The social and judicial society of medieval period was influenced by ancient Roman and Germanic culture, however, the increasing influence of Church became the guiding force to develop educational system in The Middle Ages.

The Church became more and more suspicious of Greek, Roman and Germanic culture and decided to close down all pagan schools under the decree of Justinian by the year 529. The influence of Church gave rise to monasticism. Monks, priests and bishops took the responsibility of teaching and the whole educational pattern became purely religious.

The basic course of study used to contain Latin language, grammar, logic, rhetoric, philosophy, astrology, music and mathematics. Scholars, monks and bishops used ancient writings from Roman and Greek resources to teach their students, while most of the educational courses were mostly based on superstitions and beliefs. Students often learned more when they directly came in contact with trappers, hunters, poachers and serfs as they could offer practical knowledge. The six fundamental characteristics of medieval scholasticism are accepting Catholic orthodoxy; within orthodoxy, accepting Aristotle as a greater thinker than Plato; recognition that Aristotle and Plato's disagreement about universals was a principal question to resolve; using dialectical thinking and syllogistic reasoning; accepting distinctions between "natural" and "revealed" theology; and disputing everything at length and in detail (Newman 2016).

## Developments in Early Modern Period

Historians consider 15<sup>th</sup> century as the beginning of Modern age (period) going up to 20<sup>th</sup> century. Development of education and pedagogic practices during this period were influenced by many socio-economic and political factors created by the ascent of Western Europe to global political, economic, and technological dominance during the Early Modern Age consisting of almost three centuries which historians divide into two periods: the Reformation (ca. 1500 – 1650) and the Enlightenment (ca. 1650 – 1800). This ascent was gradual; only toward the end of the Early Modern age did Western power clearly surpass that of rival civilisations in the Middle East (Ottoman Empire), South Asia (Mughal Empire), and East Asia (Ming/Qing China).

The vast economic and territorial expansion of the Early Modern age was a force for both good and ill. On the negative side, the scale of war between Western powers (in terms of troops, resources and geographic extent) grew steadily. On the positive side, the Early Modern age witnessed the rise of a large middle class (e.g., merchants, artisans, officials), which greatly bolstered the spread of literacy and scholarship (given that the middle class possessed the time and wealth to become literate and pursue scholarly activities).

Noting that in the Europe of the 1500's, few people could read and write but that by 1800, the era of mass literacy had arrived, and this was a momentous critical change. Literacy and education of a large middle class impacted on the social structures and social change in Europe between the Renaissance and the Industrial Revolution (Houston 1988).

"Humanism" is a nineteenth-century term coined from words which had been in use in the late fifteenth century, when it became common to talk about the liberal/non-theological arts subjects in a university curriculum as *humanae litterae* (literature which was human rather than divine in focus) and a scholar who had a particular enthusiasm for these subjects was called a *humanista*. Due to the blind acceptance of church orthodoxy and doctrines, humanism and secular scholarship were nearly extinguished during the medieval period: Progress in these areas was frustrated until the overarching authority of the Church was shattered by the Reformation. Humanism that forms the very core of Western civilisation today is "an outlook that emphasises human capabilities and concerns" with two main features that individuals should exercise critical thought, and that secular matters are important.

Far from being “New learning”, humanism represented a refocusing of old learning. It brought a new concentration on and a new respect for sections of traditional scholarship that medieval universities had considered of secondary importance: the non-theological parts of their arts curriculum, especially poetry, oratory and rhetoric (the arts of political persuasion by speaking and writing).

However in the fifteenth century, the technology of printing on paper opened up far more rapid possibilities of distributing copies of the texts, and gave much greater incentives for the spread of literacy associated with these innovations.

## Developments in Late Modern and Postmodern Periods

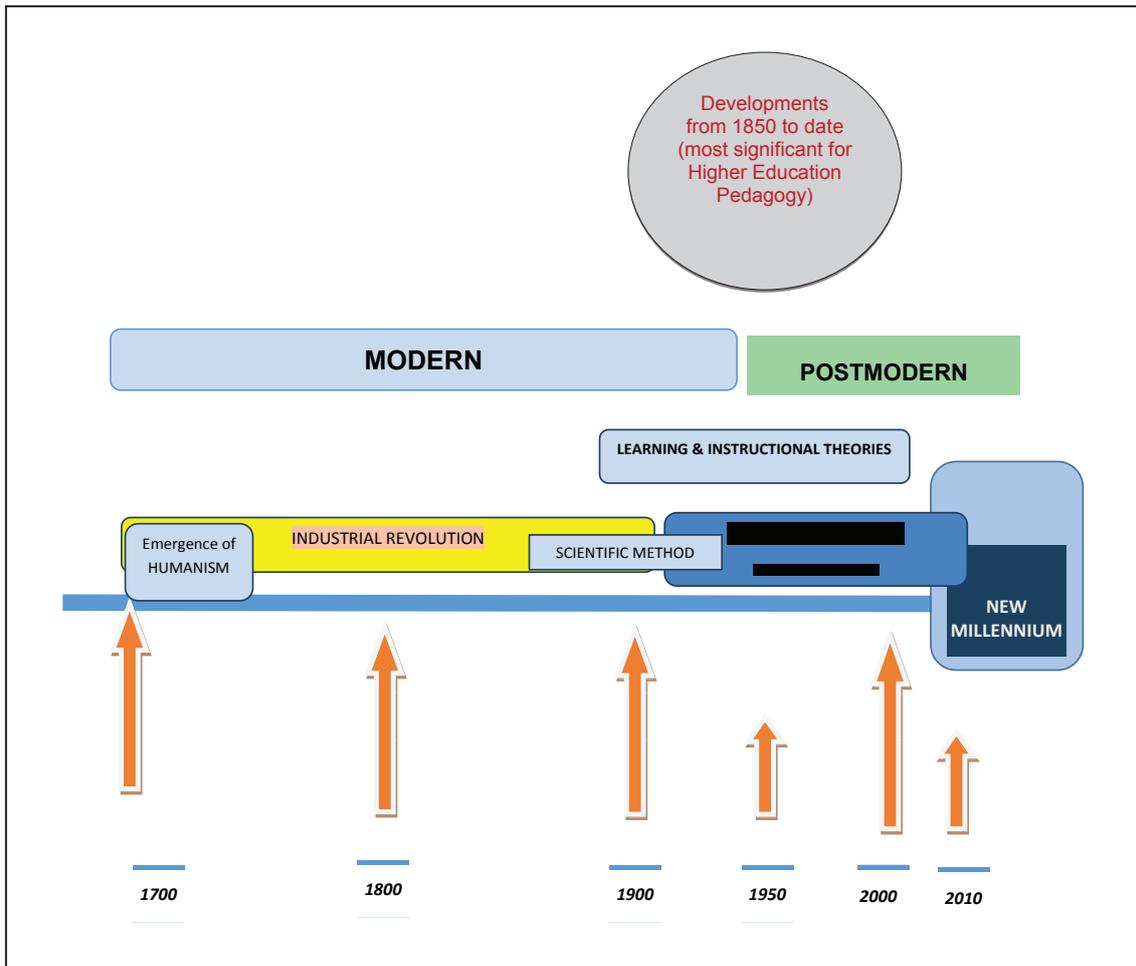
**Figure 1** presents a comprehensive picture of the developments during this time. The major schools of thought on learning and pedagogy and other theoretical positions in other socio-psychological domain, along with the developments in physical and behavioural sciences and their implications on techniques and technologies are presented in this figure.

## Impact of Industrial Revolution

Beginning in the mid-late 18<sup>th</sup> century, the late modern period of European history was a time of great social, political, and economic change (the Industrial Revolution, and the American and French Revolutions took place in this period). It saw the development of capitalism, industrialisation, nation states, and science, as well as a major expansion of European interests into the rest of the world. It was seen as a time of great progress, and “progress” is an important metaphor for this time (Gilbert 2008).

All this was made possible by some two “big ideas” (Gilbert 2008). First, is the idea of people as rational, autonomous individuals or “selves”, who think and act independently of other selves. The second “big idea” of modernism is the notion of reason and knowledge (particularly scientific knowledge) as the route to human freedom and happiness (and education as having a major role to play in this) (Tuomi and Miller 2011).

From the U.S., John Dewey’s significance for informal educators lies in a number of areas. One is that education must engage with and enlarge experience, and linked to this is Dewey’s exploration of thinking and reflection. The third is his concern with interaction and environments for learning that provide a continuing framework for practice. Finally, his passion for democracy, for educating so that all may share in a common life, provides a strong rationale for practice in the associational settings in which informal educators work (Smith 2001).



**Figure 1** Development of pedagogical theory and practice — since late modern and postmodern periods

## Scientific Method

The scientific method teaches the brain to logically examine and process all the information it receives. It requires that one observes and tests before making a statement of fact. This is the main method scientists use when asking and answering questions (Hudson 2016).

A scientist follows the same steps each time he employs the scientific method. They are:

1. Ask a question
2. Do some research
3. Formulate a hypothesis
4. Test with experimentation
5. Record and analyse observations and results
6. Draw a conclusion

The inherent process of scientific method is “hypothetico-deductive method of science” including rationalism, inductivism and positivism.

### Postmodern Period

Postmodernism is basically a critique of the ideas such as scientific method and positivism. According to one theorist, postmodernism is the passage from “solid” (stable) times to “liquid” times (Bauman 2007). It is the end of traditional structures and institutions, and the end of what another theorist calls “grand narratives” — the big, one-size-fits-all stories of modern thought (Lyotard 1984). There is a loss of faith in the idea of “progress”, the idea that we are gradually heading along the one true pathway towards certain universal goals — such as the full picture of knowledge, or equality and justice. Instead, there is an emphasis on multiple pathways and plurality; on diversity and difference; and on the partiality of all knowledge (that is, the idea that we can only have an incomplete picture, and the idea that all knowledge is biased). Change is seen, not as a linear progression, but as a series of networks and flows, connections and reconnections that, because they are always forming and reforming, never have time to solidify. Thus, where modern thought emphasises direction, order, coherence, stability, simplicity, control, autonomy, and universality, postmodern thought emphasises fragmentation, diversity, discontinuity, contingency, pragmatism, multiplicity, and connections (Gilbert 2008).

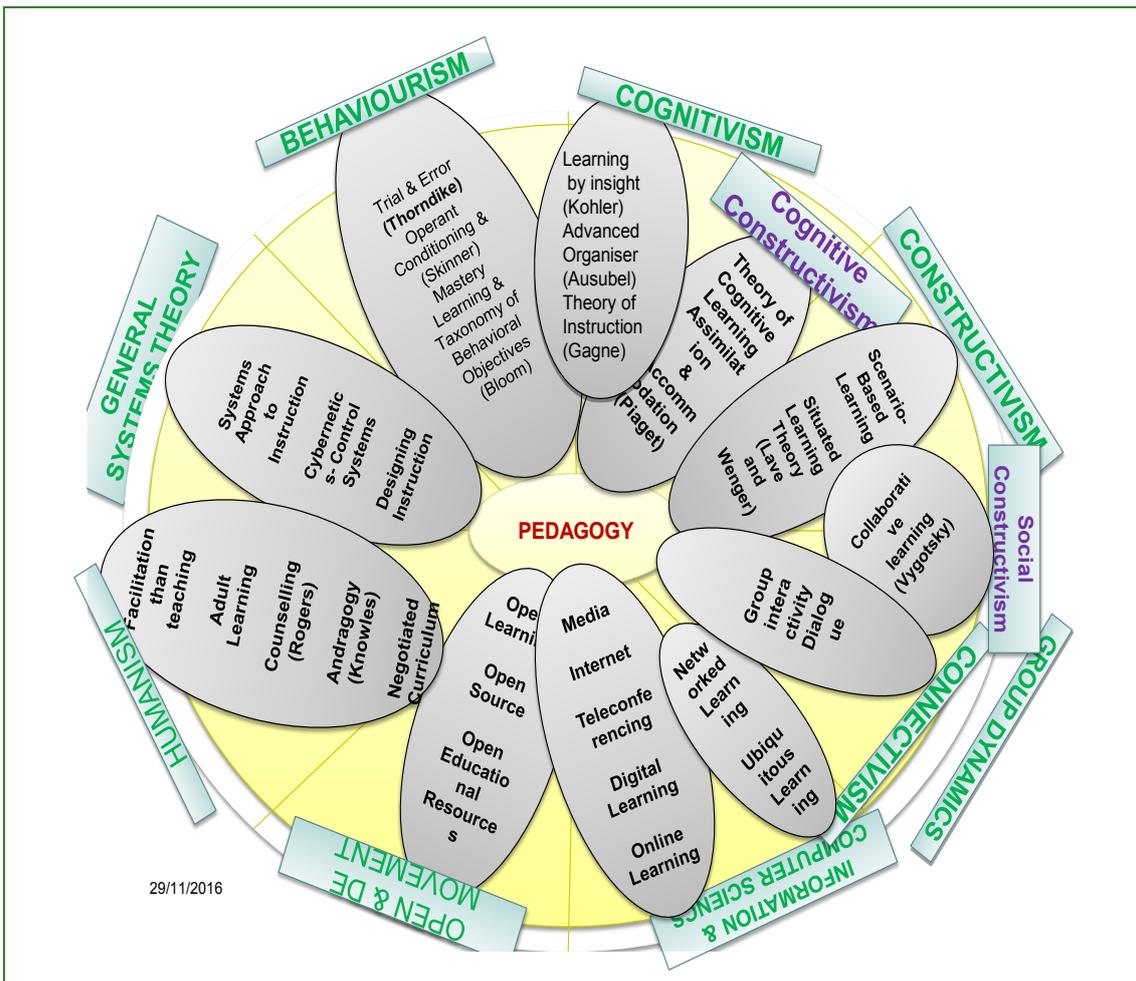


Figure 2 Impact of theories and schools of thought from Physical and Behavioural Sciences on pedagogy

## Deciding Developments in the 20<sup>th</sup> and 21<sup>st</sup> Centuries

Two very significant developments complementing each other emerged in the latter half of the twentieth century, that influenced the instructional environment in the global higher education scenario are:

1. The advent of Open Education Movement
2. The integration of Information and Telecommunication technologies

The open education had the inherent ideology of openness in all aspects related to learning, having its origins in democratic principles and humanistic philosophy and learner-centred educational provision. The emergence of techniques and technologies created by the integration of Information and Telecommunication technologies made very significant changes in all walks of life including education. The complementarity of these two developments led to increased access, individualised learning, enhanced human interaction and shifting the control over education and learning from teacher to the learner.

What made the impact of these two developments stronger while applied to education is how they complemented each other like two sides of the same coin. The vision and intentions of the “open movement” would have remained unfulfilled but for the fast developments and versatilities of various kinds of techniques and technologies emerging from the applications of ICT. These two mutually complimentary historical trends evolved and complemented each other mainly during the last five decades. It has been demonstrated through different modes, models and strategies through the application of suitable pedagogic principles, that it is possible to provide effective learning environment to all children and youth according to their individual needs within the complexity of the learning situation impacted by number, heterogeneity, ethnicity, differential abilities, etc.

### Open Education Movement

The origin of the open movement could be traced to the sixties when the Open University of UK was conceptualised and developed as part of extending education to the common man by the then ruling Labour Party in UK with Harold Wilson as the Prime Minister. When the concept of “open learning” was first introduced in the late nineteen sixties, many did not imagine that ODL systems will gain currency in the following decades and influence substantially the educational provisions in all sectors of education, especially in the higher education.

What is “openness” in the educational context? One might say that it is all about “flexibility” and “removal of restrictions” in various aspects of learner engagement such as entry qualifications, classroom attendance, course choices, duration of study, etc. McAndrew (2012) discusses how the concept of openness evolved in the last four decades. The mission adopted by the Open University 40 years ago was to be “Open as to people, places, methods and ideas” (Lane, McAndrew and Santos 2009) and thereby succeeded in “reaching the unreached” leading to “democratisation of education”. This model spread to all parts of the world with open universities, open schools and other open learning institutions coming up in several countries in both the developing and developed world.

During the nineties and earlier part of the last decade, the philosophy of openness further emerged in the provision of learning content through digitisation and online distribution with relaxation in copyright restrictions. The movement constituting Open Access, Open Content, Open Licence and Open Educational Resources emerged and could be seen as another landmark development in education and free availability of educational resources since the origin “open learning” concept in the late sixties. What does the word *open* mean in this context? This refers only to characteristics of content that will encourage other institutions and individuals to join in rather than the approach to open learning itself and the changes that embracing openness imply (McAndrew 2012). Both the concepts of “open learning” and “open resources” have been revolutionary ideas leading to significant breakthrough in democratising education and making available learning provisions and learning resources to all by liberating from rigidities of traditional campus-based educational systems and copyright restrictions. Initiatives are part of the same open learning movement which fits within “the broader framework of the history of openness that brings together a number of disciplines and fields to impact directly upon the value of knowledge and learning, their geographic distribution and ownership, and their organisation (McAndrew 2012). Thus openness characterises a kind of “transparency” which is the opposite of “secrecy” and most often, this transparency is seen in terms of access to information especially within organisations, institutions or societies. I endorse the view of Peters M. (2010) who thinks that “open education and education for openness are related aspects and perhaps one of the most significant educational movements to surface in the twenty-first century”.

## Developments in ICT and their Application in Education

The second factor which has influenced in improving access, enhancing quality of educational provisions and making education more learner-centred is the fast and revolutionary developments in technology applications in learning situations made possible by the developments in Information and Communication Sciences. The developments in this area have been fast and extensive.

The following areas of technological development facilitated by the philosophy of openness have impacted all forms of education and training.

### 1. Technology mediated Open Distance Learning:

Originating as correspondence education and home study, the entire area of open distance learning has matured considerably today allowing the required flexibility and openness for individual learners to pursue education according to one’s own needs and convenience supported by appropriate information and communication technologies suiting each community context.

### 2. Open Educational Resources:

OER movement starting with MIT’s Open Courseware initiative creation and use of Open Educational Resources and other free resources with different open licences (such as Creative Commons) has received a major boost with UNESCO and COL taking the lead in bringing out the Paris Declaration on OER in June 2012.

### 3. **Learning Management Systems:**

A learning management system (commonly abbreviated as LMS) is a software application for administering e-learning content and managing learning processes including assembling and delivering learning content, personalise content and enable reuse, provide assessment item repositories and administer online tests, etc.

### 4. **Cheaper computing:**

The last decade saw a rapidly decreasing cost in computing systems. Personal computers and tablets with fast processing and large memory are available for very affordable price today.

### 5. **Improved access to Internet:**

Broadband connectivity is still a major concern in many countries. Access to Internet is also becoming faster and cheaper in many developing countries. Digital divide is slowly but surely being bridged.

### 6. **Mobile reach:**

Mobile technology is the most affordable hardware in most developing countries and its cost of use within a country is becoming increasingly less. Smartphones are also slowly picking up popularity and also becoming cheaper. Mobile Learning (M-Learning) is fast catching up as a popular, convenient and effective mode of learning.

### 7. **Social networking:**

There is an increasing participation in social networks especially among teens and youth in the last decade. There are several social network sites available today for various purposes focusing various age groups. One of the major reasons for increased time share for informal interaction today are the virtual social connections and relationships provided by the social networking services.

## Conclusion

With the developments in open learning, digitised learning resources and the use of online and offline web environment, several possibilities emerged to design digital learning strategies to make any instructional context effective to suit the ever changing learning and learner requirements in the global network. Any of these strategies would have integrated the required pedagogical inputs to suit the contextual needs, drawn from the repertoire of pedagogic inputs/processes provided by the learning and instructional theories and practices discussed in the earlier sections of this article. Several terms are being used to name these strategies. Conceptually, e-learning is broadly synonymous with instructional technology, information and communication technology in education, Educational Technology, learning technology, multimedia learning, technology-enhanced learning, computer-based instruction, computer-managed instruction, computer-based training, computer-assisted instruction or computer-aided instruction, Internet-based training, flexible learning, web-based training, online education, virtual education, virtual learning environments, m-learning, and digital education. In usage,

all of these terms appear in articles and reviews; the term “e-learning” is used frequently, but is variously and imprecisely defined and applied. These alternative terms are all linguistically more restrictive than “educational technology” in that they refer to the use of modern tools, such as computers, digital technology, electronic media, networked digital devices and associated software and courseware with learning scenarios, worksheets and interactive exercises that facilitate learning (with a systems approach).

A few of these strategies become more popular and widely used in higher education. These include Blended Learning Strategy, MOOCs, M-Learning and Flipped classrooms (teaching). There is no attempt being made here to describe and define all these strategies and many more being used in different educational contexts. However, let us examine the following interpretation of learning potential of MOOCs.

The pedagogical foundations claimed for MOOCs follow on from their attributes and in part are justifications for those attributes. So it has been argued that online learning is particularly effective, formative quizzes enhance learning through the mechanism of retrieval practice, short video formats with quizzes allow for mastery learning, and peer and self-assessment enhance learning. Further claims have been made that short videos complement the optimal attention span of students and that discussion forums provide an adequate replacement of direct teacher-student interactions that would be considered normal for a class delivered on-campus. The justification of pedagogical benefits of MOOCs is in all likelihood teleological. It is important to understand that these are not different pedagogies based on any particular theory of learning or instruction. Each of these will combine a number of pedagogic principles which make the resultant learning environment effective.

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# Chapter 2 Professional Practices in Higher Education

~ Associate Professor Beena Giridharan

## Abstract

*Providing an incremental and robust professional development program to new and mid-career academics actively demonstrates the merit universities place on flexible and individualised approaches to staff development and career enhancement. The central objective of continuous professional development should be to encourage academics to embrace learning and teaching approaches that have sound pedagogical foundations and address learner needs. In recent years, the higher education sector has highlighted the significance of building the knowledge base of academic developers and called for systematic induction of new academics, as structured approaches are still lacking in many universities (Vorster and Quinn 2015).*

*This paper focusses on the latest advancements in professional practice in higher education, and highlights the gains and challenges of faculty development programs, that influence pedagogical approaches and impact student success. It discusses initiatives taken at Curtin University, Sarawak to support academics through learning and teaching inductions including a dedicated program for developing tertiary teaching expertise namely, FoLT (Foundations in Learning and Teaching) which is Curtin's primary professional learning program for teaching and research academics.*

## Introduction

Raising awareness among academics regarding their teaching and learning approaches is significant to enhance the learning experiences for students at the university. At Curtin University, academic staff has access to a series of programs that facilitate continuous staff development and encourage reflective practice. Reflective practice has two relevant, yet very different components used commonly within the field of education, often referred to as reflection-in-action and reflection-on-action (Schön 1991). Both facets of reflection are essential for successful learning and teaching in higher education. Academics who instinctively adapt to the learning context and make changes in their approaches are conducting reflection-in-action, while reflection-on-action occurs as post-teaching in a formal and systematic process where the academic identifies areas for review and improvement. The onus to underscore the significance of understanding the value of reflecting on learning and teaching practices rests with academic developers, support structures, and units responsible for continuous professional development among academics.

## The Changing Higher Education Environment

The higher education landscape is changing rapidly. Higher education communities are no longer dominated by disciplinary experts who transmit knowledge to learners. Advances in technology and competitive higher education environments necessitate institutions to adapt to the complexities placed before them. Content is a ubiquitous commodity available to learners, and can be easily produced by talented knowledge creators including professors, organisations, libraries, and think tanks etc. Many organisations and universities offer MOOCs (Massive Open Online courses) with the intention of widening access to higher education. In the delivery of MOOCs, talent is a defining factor for success and engagement with the wider audience of learners. Higher learning institutions had to place emphasis on best practices in the attempt to maintain high standards in learning and teaching. The complexities and uncertainties that challenge the higher education sector require institutions to continuously adapt while upholding quality standards.

On a global scale, there has been a shift towards student-centred learning approaches at universities. The expansion of higher education providers, in tandem with the entrance of multi-model delivery providers, and diversification of student types entail equity at the very centre of quality issues. Students seem to be more aware of the equality of treatment and call for provision of equivalent teaching and learning opportunities, and to be assessed fairly in order to get the education they deserve for employment and social inclusion (Henard and Roseveare 2012). This translates into a need for academics to be equipped with better understanding of student learning processes, and to have communicative abilities to be able to facilitate student learning and engagement. In addition to being an expert in their discipline, higher education teachers are now required to have effective pedagogical skills for delivering student learning outcomes and must be able to seek co-operation from students, colleagues from other departments, and from external stakeholders as members of a dynamic learning community (Henard and Roseveare 2012). Academics are encouraged to share best practices and collaborate to change teaching practice within the higher education. Professional development in learning and teaching in higher education is shifting towards a model based upon collaborative strategic initiatives (Littlejohn and Peacock 2003).

## Knowledge of Teaching Approaches

There is incremental evidence to show that the way in which academics perceive their own learning and teaching practices influence their teaching, and this in turn translates into better learning approaches for students (Dunn and Griggs 2000). A study conducted in Australia on students' first year experiences (Krause et al. 2005) reported on students calling for academics to devote more interest to their teaching practices, provide constructive feedback to students on their progress, and to make themselves more available for consultation. It is undeniable that academic staff is hugely responsible for contributing to the way in which students engage with their learning and their learning communities.

Tertiary teachers stand to benefit from developing a good understanding of how knowledge becomes meaningful in practice, given the empirical and theoretical insights and evidences made available through various studies (Schon 1987). Understanding the relationship between knowledge and practice would improve practice. Academic developers and officers responsible for providing continuous professional development to new and continuing academics need to foster and support best practices in learning and teaching.

There have been substantial advancements in the last decade to improve teaching quality in Australian Universities through provision of funds for research in teaching and learning, and rewards and recognitions for excellence in teaching and learning (Daley 2001). Recognition and rewards to teaching and learning research and practice can significantly improve better learner engagement practices among academics. At universities, transformational changes can be achieved by rewarding practitioners' involvement in inquiry processes and knowledge sharing (Nimmo and Littlejohn 2009). One of the ways in bringing about transformational change is the reward and recognition of new attitudes, values and ways of working.

## Developing Competence and Graduate Attributes in Learners

The higher education sector focussed on the development of specific competencies and general attributes among graduates largely as a result of employer concerns regarding the transferable skills of graduates. Among the responses to employer concerns by higher education institutions and quality assurance agencies are the identification of general attributes and skills that are important in contexts after graduation, and being able to transfer skills from academic degree studies to workplaces, to advanced studies and across career paths (Sadler 2013). Graduate attributes are qualities, skills and intellects a university community agrees that students should develop while they are at universities, and go beyond the disciplinary expertise or technical knowledge that form the core of university courses, as they prepare graduates to be drivers of societal change in an unknown future (Bowden et al. 2000).

Curtin University graduate attributes comprise nine characteristics ranging from ability to apply discipline knowledge, communication skills, apply international perspectives, to cultural understanding and professional skills. It is expected that graduates will acquire and demonstrate technical knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge during their course of study.

For graduates to consciously develop competencies and skills in addition to discipline knowledge, it is plausible to expect that academics would themselves model those attributes and characteristics. Learners must have opportunities to practise and cultivate these standard behaviours that set them apart and give them the competitive advantage compared to individuals who do not have higher education experiences.

Bill Haslam, the Governor of Tennessee, USA, in a TIME Magazine report stated that one of the biggest challenges states in America faced was producing a workforce that was sufficiently qualified to meet the needs of employers to serve today's economy. Haslam proposed for state governments to change the way they funded higher education in order to increase degree attainment and to close the skills gap that existed between workforce supply and industry demand (<http://ideas.time.com/2012/10/18/8-ideas-to-improve-higher-education/>). Similar reports on the mismatch of skills and attributes of graduates have emerged in Malaysia with some reports showing high rates of unemployment among Malaysian graduates due to poor communication skills and English language proficiency.

According to the findings of a Graduate Tracer Study conducted in Malaysia in 2006, 30.7% of graduates remained unemployed six months after graduation, while 5.7% awaited job placements. The study had involved 132,900 graduates from 18 public universities, 18 polytechnics, 34 community colleges and 13 private institutions of higher learning from all over Malaysia (New Straits Times 2007).

Recent statistics showed that 161,000 graduates or 8.8 per cent of youths, aged between 20 and 24 years in Malaysia had yet to find a job (<http://penangmonthly.com/tag/education/>). The above reports highlight that undergraduates entering the workforce need to acquire more than disciplinary knowledge. In fact, it is evident that learners must acquire all types of knowledge during their course of study at university such as: factual knowledge, conceptual knowledge, procedural knowledge and metacognitive knowledge, as outlined in knowledge dimensions. Against this context, it is imperative that higher learning institutions provide learners the opportunities to interact, understand, and acquire attributes implicit within the whole knowledge spectrum. The opportunities to develop knowledge dimensions prevail from formal and informal learning interactions both with peers and faculty.

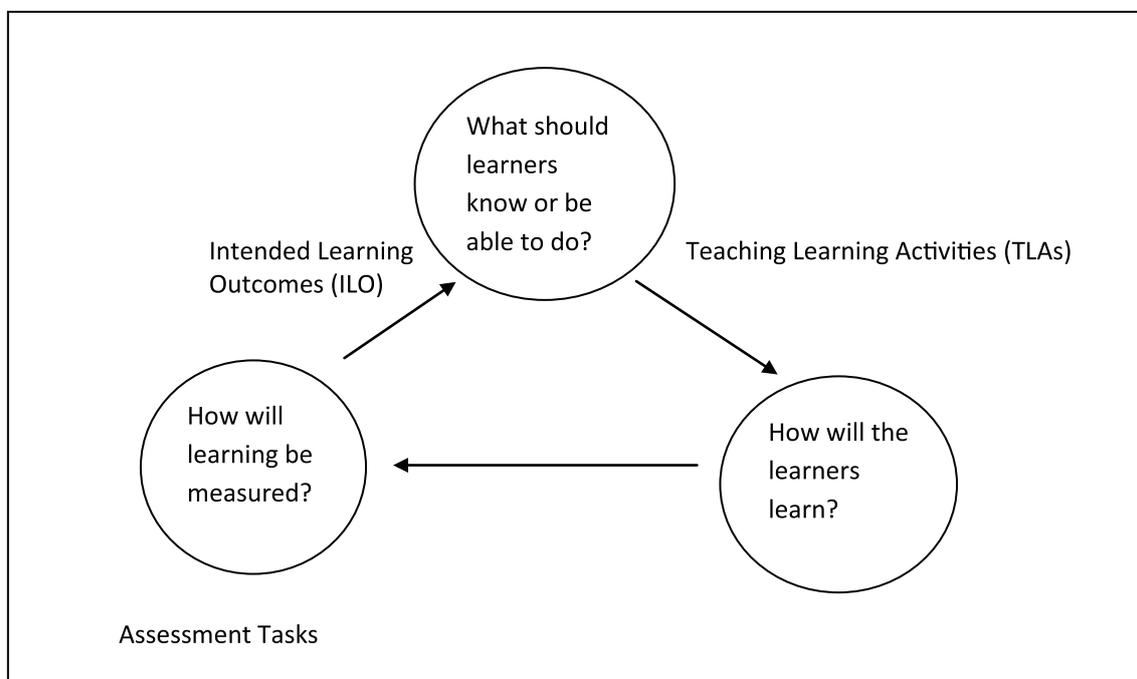
## Professional Practice Competencies in Higher Education

Professional practice is characterised by increased complexity, unpredictability, and the rapid emergence of new knowledge and technology (Barnett 2004; Schön 1983). A widening gap between higher education and requirements of industry, and between what is learned through professional education and competencies required at the workplace have been reported by researchers (Burnet and Smith 2000). Others like Nilsson (2007) recommend that the development of meta-competence, such as flexibility and the ability to learn, as well as socio-communicative competence be given priority over subject-specific knowledge, or discipline-related knowledge that is seen to become obsolete more rapidly than previously. Assertions that there are deficits in the graduates' competences related to the demands for successful professional practice, and increased concerns that the institutions of higher education are not preparing students for the "increased complexity and the changing demands that characterise professional practice" (Nilsson 2007, 11) warrant that professional development for academic staff is essential.

Reflective practice is widely employed across higher education in professional contexts, and in academic development planning for students and staff. It is also applied within induction programs in professional development for new members of academic staff. In the context of reflection and experiential learning, a written reflective piece provides insights not recognised during the experience (McGill and Beatty 2001). Critical reflection allows for evaluations that relate to professional ethics, justice and fairness; as well as the wider political or social environment in which the practice occurs. Critical reflection can thus be seen to take in the wider environment within which professional practice occurs, also providing a link to motives that underpin practice (McCarthy 2011).

## Support for Quality Teaching and Learning Pedagogies

Developing and fostering quality teaching involves the use of pedagogical techniques to produce learning outcomes for students. It entails numerous aspects, for instance: the effective curriculum design and course content, inclusion of a variety of learning contexts, provision of constructive and timely feedback, and effective assessment of learning outcomes (Henard and Roseveare 2012). To achieve good teaching, there must be “constructive alignment” (Biggs 2003). In constructive alignment, the learners are able to construct their own knowledge through appropriate learning activities that encourage achievement of the desired learning outcomes. The key aspects of the teaching system — the curriculum and its intended outcomes, the teaching methods used, and the assessment tasks are aligned to each other (Biggs 2003).



**Figure 1** Constructive Alignment (Biggs 2003)

In constructive alignment as shown in **Figure 1**, the intended learning outcomes, the teaching and learning activities that assist achievement of the learning outcomes, and the assessments to measure the learning achievements are perfectly aligned.

Henard and Roseveare (2012,7) recommend a three level inter-dependent support system for developing teaching expertise that may produce optimum results.

1. At the institution-wide level: including projects such as policy design, and support to organisation and internal quality assurance systems.
2. Programme level: comprising actions to measure and enhance the design, content and delivery of the programmes within a department or a school.
3. Individual level: including initiatives that help teachers achieve their mission, encouraging them to innovate and to support improvements to student learning and adopt a learner-oriented focus.

All the above initiatives require specific teaching and learning frameworks and policies that are aligned to the strategic priorities of the university and demonstrate the commitment the university places towards sustaining quality teaching and learning practice.

## Learning and Teaching at Curtin University Sarawak

*Curtin Learning and Teaching* underscores excellence in teaching and learning practice. In order to achieve this, support is provided for excellence in learning design, assessment, quality learning and learning engagement. Active learning, problem-based learning and work-integrated learning are given primacy and emphasis ([http://ctl.curtin.edu.au/teaching\\_learning\\_practice](http://ctl.curtin.edu.au/teaching_learning_practice)). Teaching excellence is fostered at institution, program, and individual level through structured systems supported by university wide policies and processes. Support for quality teaching is manifested through a wide range of activities that are likely to improve the quality of the teaching process.

The Dean, Office of Learning and Teaching, is responsible for strategic and academic leadership, and continuous enhancement of teaching and learning across all programs at Curtin Sarawak. These priorities are achieved by working collaboratively with Faculty Deans, Heads of Departments, and Associate Deans of Learning and Teaching within faculties, and student bodies. Support activities foster teaching excellence via continuous professional development, teaching excellence awards and recognition, support for innovative pedagogy, developing communities of teaching and learning practice, and ensuring optimal learning environments with technology-enriched spaces.

Continuous professional development is a requirement for all new and continuing academics at Curtin Sarawak. The programs commence with learning and teaching induction workshop for all new academic staff that is conducted each semester in the academic calendar. This is followed by staff participation in a postgraduate certificate unit in tertiary teaching that is awarded 25 credits. Foundations of Learning and Teaching (FOLT) is Curtin's primary professional learning program for teaching and research academics.

At Curtin University, Sarawak, the program is completed by new academics over a semester period of 12 weeks with a further 4 months given to complete a full teaching portfolio. It requires weekly contact of 2 hours over a 12-week semester and completion of four assignments. The sessions are facilitated by the Dean, Office of Learning and Teaching, in a collaborative manner, and in a flipped delivery mode, to model innovative approaches adopted institutionally.

The program articulates into a range of specialist professional learning programs supporting Transforming Learning at Curtin among other professional developmental activities that encourage scholarship of learning and teaching.

New and continuing academics participate in continuous professional development via a calendar of events such as the university learning and teaching seminar series offered once a month at the university level. The sessions centre around topics that are current and relevant to the higher education sector, and encourage development of innovative pedagogy and learner engagement. Specialised workshops are conducted additionally for developing a range of competencies required by professional and accrediting bodies. Innovative pedagogies are encouraged via provision of yearly teaching and learning research project funds, and scholarship of teaching and learning is supported via conference participation.

Support units at faculty and department levels foster student and staff achievements in learning and teaching via mentoring and consultation activities. Continuous improvements are effected through responding to student evaluations conducted each semester that rate course and learning experiences, and quality teaching.

## Conclusion

Continuous professional development is an imperative to ensure competent professional practice in higher education. The individual performance of each faculty member is a crucial factor in achieving quality teaching. Institutional policies, procedures and standards are essential to encourage and support the achievement of excellence in learning and teaching. Self-evaluation of experimentations, peer-reviewing, benchmarking of practices, and reflective practice promulgate quality teaching and learning standards.

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# Chapter 3 Assessment: Assisting Students to Learn as Well as Certifying their Achievements

~ Professor Glenda Crosling

## Introduction

Globally, higher education has experienced large-scale change in recent decades, with the result that large numbers of students from a range of backgrounds are currently studying in higher education institutions. One outcome of these changes has been that institutions now need to focus on students and their learning, rather than mainly on teaching processes and syllabi. Within this context, it is now understood that the assessment of student learning through formative feedback means plays a powerful role in focussing students' approaches to their study. Not only is assessment a means through which students can be guided as to appropriate study approaches that position them for academic success, some commentators have gone so far as to state that it "drives" student learning.

However, as well as the formative, the other major role of assessment is the summative, which indicates the level of students' achievements in their studies. The view presented in this paper is that the summative role is important and, in today's world, may be seen as necessary. Summative assessment in the form of the grades and standards achieved by students in their studies certifies officially students' achievements. It is also one means through which higher education institutions can demonstrate their accountability and their credibility, which has implications for the institution's reputation and hence their sustainability (Crosling 2012). For instance, employers may be sceptical of institutions where students achieve high grades but seem to lack competence. However, summative assessment on its own and as the major way for students to gain feedback on their academic performance is inadequate. It needs to be combined with strong and effective formative feedback to assist students to develop understanding and be able to meet academic expectations, thus operating to maximise students' academic experience and achievement, as seen in their grades in summative assessment.

Importantly, the quality and usefulness of the assessment of student learning cannot be separated from the quality of the educational programme in which it is situated. It has long been established that educational programmes do not operate in a vacuum, devoid of understandings of the students and their current and future needs (Schwab 1973). As well as the degree to which the programme acknowledges and responds to the nature of the student body, a major determinant of quality is the degree to which the programme prepares students for their lives and professions in the world following graduation. Assessment practices also need to be integral to the educational programme, and part of a coherent scheme for student learning. At the same time, there is little doubt that assessment standards should be rigorous to ensure the maintenance of academic standards to be valid and test what was set out to be tested, and fair to all students, recognising the nature of the student cohort.

In addressing these issues, this paper discusses the characteristics of quality in educational programmes, the major role of assessment in teaching and student learning, the importance of sound design for assessment in educational programmes, and ways that assessment can be structured to recognise student diversity and prepare students for the world of the twenty-first century. The paper concludes with examples of formative feedback to assist student learning and assessment tasks that encompass skills for the twenty-first century.

## Quality Student Learning for the Twenty-First Century

### The Educational Programme

An initial point for sound assessment approaches is the quality of the educational programme in which they are positioned. A quality educational programme has clear outcomes for student learning that address the needs of the twenty-first century, with the programme preparing students accordingly. This means that very often, educational programmes and the inherent assessment processes cannot remain as they were in the past but require review to retain their currency and relevance, and therefore their quality. As the great educationalist John Dewey has been quoted as saying in relation to teaching that “If we teach today as we taught yesterday, we rob our children of tomorrow”. Consequently academic staff in higher education institutions has a responsibility to keep their academic programmes current and to look for the best teaching approaches to prepare students for society and their future lives. In the same way, the “shape” of the educational programme has major implications for what can be considered appropriate assessment approaches. Assessment of student learning, being integral to the educational programme, is also not a static process that can be repeated in the same form over time. That is, as well as grasping subject content which, in itself is evolving and developing, students in higher education today need to be prepared for the changing world.

The world of today and the future in which graduates will operate and to which the educational programme and forms of assessment need to be aligned is the globalised and interconnected knowledge society. Requiring personnel who are able to devise new solutions to emerging issues that arise in the rapidly changing and technologically-charged world, the knowledge society enables immediate information sharing and learning internationally, and is the outcome of “complex technical, social, economic and human factors” (Tuomi 2005, 4). Through finding solutions to problems, the knowledge society enables nations to create economic and social capital (Crosling, Nair and Vaithilingam 2014), leading to their increased competitiveness and sustained economic development. In the widening, deepening and speeding up of worldwide interconnectedness in all aspects of contemporary social life (Held, McGrew, Goldblatt and Perraton 1998), old or traditional solutions to problems may no longer be suitable for the emerging scenarios. To participate effectively in the knowledge society, nations require populations that are capable of developing new solutions.

The knowledge society is built on constant improvement, to keep pace with rapid changes, and populations in nations need to be prepared as lifelong learners who are empowered workers, and equipped to rapidly transform information into responses. In the previous era of the Information society, the emphasis was on collecting and collating data and information (European Foundation for the Improvement of Living and Working Conditions 2005), and so assessment approaches that focused on description of information may have been appropriate. However, it is well established that in the knowledge society, transforming information, knowledge and data into

usefulness to solve problems is key. Education, particularly higher education, has a vital role to play in preparing graduates to operate accordingly. For example, in Malaysia, education policies ensure that the educational programmes meet Malaysia's needs as it moves from a production-based to an innovation-intensive economy (Nair 2011). Also, many developed countries continue to cite education highly in national development plans to promote national competitiveness (Crosling, Nair and Vaithilingam 2014). For example, the recent Australian review of higher education (Bradley, Noonan, Nugent and Scales 2008) emphasised the importance of quality higher education as contributing to a workforce that will enable Australia to compete effectively in the new global economy (Crosling, Nair and Vaithilingam 2014, 2).

In having the capacity to respond to new situations for which past responses are no longer adequate, graduates thus need to be equipped with skills that will enable them to be flexible and creative in their thinking. As Henderson (2008) points out, success in the evolving global economy is premised on creativity, ingenuity and innovation, and preparation of people for work and life in the twenty-first century requires educators to foster students' creativity (Henderson 2008). Emphasising this point, Henderson (2008) writes that the workers with creative capacity is the most rapidly growing job area on which emerging industries rely (Henderson 2008). Concurrently, as the interconnected world impacts the national level, universities need to produce graduates who, in the borderless and changing global context, are able to live, work and contribute productively (Hudzik 2011).

## Student Diversity

The globalised and interconnected world has an impact on the higher education system worldwide, resulting in greatly increased student diversity over the past few decades. This has implications for educational processes, as well as the entwined assessment processes. In the last few decades, the system has undergone massification (Trow 1973), resulting in a change in the backgrounds of attending students. Previously in the "elite" higher education system, only a small proportion of national populations participated (Trow 1973). As nations have required more educated populaces in the knowledge society, a much greater percentage of populations have attended. For instance in Malaysia, the percentage of the relevant age population attending higher education in 2009 was 38 per cent (Tham 2011, 8), compared with an extremely small percentage at the time of independence from Great Britain in 1957 (Crosling, Cheng and Lopes, forthcoming). The aim is for the percentage to reach 53 per cent by the year 2025 as laid out by the Malaysian government Ministry for Education, the *Malaysian Education Blueprint 2015 – 2025 (Higher Education)*.

At the same time, the increasingly interconnected, globalised and internationalised world has meant that there is large scale movement of students and academic programmes across national borders. For instance, in Malaysia currently, about 10 per cent of the student population is international or foreign students (The Sun Daily 2015), who bring to their studies a range of educational and cultural backgrounds and expectations of study which may not be in line with the expectations of higher education institutions.

In addition, such students bring richness to the educational processes as they have the capacity to contribute to the studies with varying perspectives. The outcome of these large scale changes has been diversity in the backgrounds, experiences and academic expectations of students in higher education institutions. The diversity includes students who are international, from non-English speaking background, mature aged, women and men in non-traditional disciplines and students

with disabilities. Generational change of students is evident and needs to be acknowledged in educational programmes and hence assessment. Current students of the Gen X and Gen Y hold values and expectations that differ from the previous generations of students. For instance, students today are technological natives, with technology imbuing all aspects of their lives, they multitask, and like to work with other people (2016). In order to assess as accurately as possible students' levels of development of the learning outcomes, students' preferred modes of communication need to be considered.

Implications for educational programmes including assessment are that students from diverse backgrounds may be unfamiliar with academic processes, requirements and expectations. Formative assessment assists students to understand requirements and how they are performing in relation to these.

## Assessment, Quality Educational Programmes and Student Learning: In and for the Twenty-First Century

Assessment plays a powerful role in student learning and has been seen as a major driver to change the way students study and to focus them on appropriate ways to go about their study (Gibbs 2010). This view is reiterated in the definition of assessment by Huba and Freed (2000, 8), which also encapsulates assessment's dual roles as discussed earlier. Assessment is:

... the process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what students know, understand, and can do with their knowledge as a result of their educational experiences; the process culminates when assessment results are used to improve subsequent learning (Huba and Freed 2000, 8).

In line with the view from Gibbs (2010) discussed above, while assessment is concerned with indicating students' skill and competence attainment, it is clearly more than only ascribing grades, and is also the key in improving and enhancing student learning. This is a formative role for assessment. These dual roles of assessments are succinctly indicated in the following view of assessment: Assessment of learning identifies a student's level of performance, most likely in marks or grades, and assessment for learning supports and facilitates (Sambell, McDowell and Montgomery 2012).

A quality educational programme is well designed in terms of assessment in relation to the programmes' learning outcomes and the teaching and learning approaches in place (Biggs 2000). The alignment concerns all major components in the teaching system: the curriculum, the learning outcomes expected, and the teaching and learning activities to achieve the expected desired learning outcomes. Biggs notes that a poor system has unintegrated components, and does not support high-level learning, while a good system demonstrates the alignment of all aspects of teaching and assessment, encouraging students to use higher-order learning processes. These include those processes appropriate for creativity and flexibility as required for the twenty-first century. Thus, students develop understandings through their own learning activities, rather than through transmission from the teacher to the learner. In Biggs' understanding (2000), teaching is a stimulus for learning.

It is thus apparent that an educational programme in which quality student assessment is situated requires a focus and learning outcomes that are relevant, and which is underpinned by sound design. Integral to the design is alignment between the learning outcomes, and the assessment are teaching and learning activities that are structured to achieve the desired learning outcomes. A quality educational approach may be classified as student-centred, where the focus is on students being active rather than passive in their learning so as to develop higher order skills and understandings as relevant for the twenty-first century. The student-centred approach is not new and can be traced back to Socrates and the enquiry-based approach, and more recently, to Rogers' (1969) client-based approach. With both constructivist and social constructivist theoretical underpinnings (Svinicki 1999), it reflects active learner control which is motivational, and from the social perspective, social and active bases of learning. Subject matter is integrated, with the teacher functioning as a guide to the students who operate with independence and autonomy in learning, by using discovery techniques, outside the classroom as well as within. Both cognitive and affective learning domains are valued, as well as the process (Brandes and Ginnis 1986).

Students' ability to be flexible and creative in their thinking and to solve problems as suitable for the twenty-first century is facilitated by students actively engaging in their studies (Crosling, Thomas and Heagney 2008). Such an approach may be classified as student-centred, where the focus is on students doing the learning, rather than the teachers telling the students what they should learn, and the assessment checking their learning in a rote type of manner. In contrast to this, the teacher-centred approach sees the teacher as the distributor of knowledge to students who are somewhat passive and rely on the teacher, with the emphasis on memory, practice and rote learning (Brandes and Ginnis 1986). In line with a student-centred educational approach and constructive alignment of the curriculum for learning that addresses the twenty-first century skills, formative assessment is highly relevant and integral, especially in the context of student diversity where students bring to their studies varying cultural and educational backgrounds when compared with the more homogenous student cohorts of earlier times (Crosling 2012).

Students may initially hold varying expectations of higher education studies, including the nature of knowledge and its development. Formative assessment is premised on the notions that students can learn through assessment, that all students can succeed with appropriate guidance, and that their beliefs about themselves as learners affect their achievement (Huba and Freed 2000). It provides interactive and timely feedback, encourages reflective assessment with peers, and aims to position students to be able to appreciate what is quality learning in higher education, and the aspects of their work and understandings that are aligned with academic expectations that underpin success in learning, and those that are not. It assists students to be able to adjust inaccurate assumptions and their work vis-a-vis academic requirements. The ultimate aim of formative feedback is to develop in students the tools and understanding so that they can self-assess their own work in relation to expectations and prepares them for the world where there are no correct solutions to emerging problems. Summative assessment, on the other hand, certifies and provides feedback to students only through summarised reports of academic achievement as reflected in grades, and is separate from the act of teaching (Huba and Freed 2000).

There are implications for teachers and students with formative assessment and for their relationship, as outlined by Nicol and MacFarlane-Dick (2006). For students, they take more responsibility for their own learning, while the teacher relinquishes some control of students' learning, and shares learning outcomes and success criteria with students. Importantly, formative assessment provides information about their students' learning that can be used in the ongoing teaching programme, and encourages teacher and peer dialogue around teaching and overall, recognises the profound impact of assessment on students and their learning (Huba and Freed 2000).

## Examples of Assessment: Formative and for Twenty-first Century Skills

### Formative Assessment

This section of the paper provides some practical suggestions of how formative assessment can be integrated in practice in higher education to enhance student learning, particularly in the context of student diversity. The discussion draws on the points outlined previously regarding the need for quality educational programmes for the twenty-first century, the scenario of student diversity, and the significance of sound programme design.

For effective formative assessment that impacts on students' academic performance, it is vital that the learning outcomes are clarified at the programme planning stage, as outlined earlier in this paper. These outcomes are then filtered down from the programme level to the individual subject level, with relevant adjustment for the particular subject. The result of determining the outcomes for both students and teachers is that there is coherence in the learning and teaching programme, and discussion among teachers and students about the purpose of the studies can take place. Students' control over their learning and hence their motivation is enhanced through their increased awareness about academic directions.

It is then important to ensure that the learning outcomes for both the programme and the particular subject are shared by the teachers with their students. This action will assist students to develop a clear and relevant focus for their thinking and their study approaches. It also provides the opportunity for dialogue between students and teachers to be opened as mentioned above, so that misconceptions can be clarified. Interestingly, the dialogue provides the opportunity to teachers to appreciate the varying perceptions that students may hold of the stated outcomes, given their diverse backgrounds and study expectations. The effect is that continual quality improvement can take place as teachers understand areas of confusion and amend the outcomes, leading to less ambiguity for the next student cohort. Furthermore, understanding students' perceptions provides valuable data that can be drawn on in the ensuing teaching programme, so as to broaden students' perceptions of varying cultural settings.

Sharing these outcomes with students needs to take place frequently throughout the semester, rather than only at the beginning when students may be overwhelmed with the large amount of information they are receiving. Furthermore, the learning outcomes should take on additional dimensions as students' understanding of the subject increases, and in discussion with students, serves as a way for teachers to guide students to deeper and higher order levels of thinking, which are the hallmarks of higher education studies.

Not only is it important to state the learning outcomes, it is also very useful for student learning, for the teacher to probe students' understanding of these as the semester progresses. This can be achieved by the teacher asking students appropriate and relevant questions about the outcomes of their learning vis-a-vis the desired learning outcomes. This process also demonstrates to students the varying notions that may be held of concepts and provides an ideal opportunity to assist students to appreciate the evolving nature of knowledge that underpins higher education studies.

In presenting assessment tasks to students, it is useful for the teacher to draw students' attention to the assessment criteria, and to relate the criteria generally to the subject and programme learning outcomes. This practice will assist students to appreciate the purpose of the task in their learning, encouraging their motivation and deep approaches to the task. Providing examples of the meaning of assessment criteria helps students to develop a practical understanding of their realisation in student work.

In providing feedback in class to students' oral responses and on their written work, it is useful for teachers to focus on comments on the desired learning outcomes for the subject, as well as those for the particular task. In so doing, providing explicit suggestions for improvement through action points helps students to narrow the gap between their own and the expected academic performance. The emphasis in responding to students' efforts should be on improvement, and what students need to do in their thinking and study approaches, rather than solely on the reasons why responses are not suitable.

Feedback on assessment tasks can be done in the class setting, as well as at the individual level. Common misconceptions that are evident across the class in completing the task appropriately can be discussed, and examples of expected and excellent responses can be provided. Explanation of aspects of the task that were handled well can be provided, and suggestions for improvement of the less well-handled aspects again guide students' understanding of good performance.

Following the completion and assessment of tasks, teachers should strive to adjust their teaching to provide emphasis on areas for improvement and where there is lack of understanding. To develop students' ability to self-assess, students can be asked to gauge their current learning against the learning outcomes for the subject. Peer assessment is valuable, and can be drawn on, for instance, by asking students in class to review the feedback they have received on assessment tasks, and to discuss this with their classmates, and how their work and understandings can be improved. The following suggestions may be useful to assist students to self-assess their learning as the teaching programme evolves across the semester. It can also help to provide information on students' learning at various stages that can then be used to adjust the teaching programme to better address students' learning needs.

At the end of lectures, students can be invited to place comments and questions about the topic, the subject material and their learning in a box. These comments and questions, which can be addressed in ensuing classes, require students to synthesise their learning, encouraging them to develop control over it. Students can be asked to discuss with their classmates their developing understandings of the content of their study, and how it relates to the learning outcomes for the subject and the programme.

At the end of a class or lecture, students' reflection on their learning can be encouraged by asking students what they have learnt from the class, or what they thought was the most important point. These individual responses can be shared with a partner in the class or lecture, with perhaps one or two student responses surveyed and commented on by the teacher.

During class, students can use their mobile devices to text questions or comments to the teacher. The teacher can, at an appropriate stage in the class or lecture, review these and comment for the class. If the question or comment requires more than a quick response, it can be addressed by the teacher in the next class. Alternatively, the teacher can pass the question or comment over to the students, who can then take a short amount of time in the class to discuss it with a classmate.

An online discussion forum for students' comments and interactions about certain points or questions is very useful in the context of student diversity, where some students may lack confidence in their language skills and understanding. It enables students to interact without drawing attention to themselves personally, build their confidence, and importantly, provides a venue to clarify understandings. The teacher can moderate these discussions and address common concerns online and/or in class.

## Twenty-first Century Skills

Following the next section are some assessment approaches that have been implemented in higher education institutions in the United Kingdom (Attwood 2009) that address the development and assessment of skills, and these encompass skills for the twenty first century. The assessment tasks require students to think flexibly, to self-reflect, solve problems and use creativity. In requiring students to utilise these skills to meet the task requirements and therefore achieve good grades, students are directed to appreciate the focus of the subject, and have the opportunity to develop and apply them. In this way, the tasks are using assessment to assist student learning, as well as making judgements about the levels of students' learning in a summative sense. As mentioned earlier, it is important that there is alignment between the learning outcomes, the assessment and the educational approach. Thus, students need to have had the opportunity to practise the above-named skills through their class and study activities before they are assessed on them in the assessment task. Formative feedback in class and through peer interaction also helps students to gain a clearer conception of the required skills.

The student-centred nature of assessment tasks such as those discussed below requires students to be active in their learning, developing students' independence in their learning, rather than teacher dependence. Independence underpins students' ability to solve problems and to think flexibly and creatively. The following examples have been classified as approaches that turn students into active partners in their learning (Attwood 2009).

Students taking a subject on conflict simulation at King's College London can study war board games. Rather than writing conventional essays analysing the genre, the students must absorb its principles and design a fully-fledged simulation game of their own (cited in Attwood 2009).

The task above asks students to apply theory to a practical situation, synthesise information, and then use it in a creative way to develop their own war game. They are solving a problem when they design their own game.

At the University of Plymouth, second-year marine biology students must devise and present research proposals to third-year students who assume the role of members of the Natural Environment Research Council. The first-year students, in the role of “taxpayers”, also have their say as to how the money should be spent (cited in Attwood 2009).

In this task above, drawing on peer interaction, students are required to flexibly adjust their thinking through assuming another identity. Creativity is emphasised as students devise research proposals which by their very nature require examination about what is known in the discipline, and what is a justifiable research task.

Business students at the University of Gloucestershire are given a marketing plan for a company in advance of their exam. In the examination, they are presented with a series of changes that have taken place to which they are asked to respond (cited in Attwood 2009).

The task above requires business students to imagine an alternative scenario, and with the use of mental flexibility, analyse and discuss resultant changes.

Those enrolled on Masters in creative writing at the University of Salford can choose the form in which they submit their work via CD-Rom, a website, an installation or a performance (cited in Attwood 2009).

Creativity in thinking through devising an alternative presentation form is emphasised in the above task.

Students studying mental health at Leeds Metropolitan University collate a scrapbook of reflections arising from recovery stories, and work collaboratively online to develop the assessment criteria for the exercise (cited in Attwood 2009).

Peer interaction and teamwork are encouraged in the above example, and self-assessment is inherent to working successfully in a group.

In the module “Web research for historians”, students at the University of Leeds learn how to evaluate online sources with a critical eye, before creating their own website on a history topic. Marking criteria take into consideration whether material has been suitably adapted for the web (cited in Attwood 2009).

The ability to think critically and to apply it in their own work is emphasised in the task above. Critical thinking is a necessary precondition in thinking creatively as creativity in itself requires an approach that differs from those already available.

Multimedia students at the University of Gloucestershire upload their graphic work into an interactive virtual gallery. The work is anonymous except to the tutor, who can add online feedback. Students can view all the work and comment in small-group situations (cited in Attwood 2009).

Peer assessment underpinning the ability to self-assess is integral to the above task.

Students in the final year of a creative writing degree at Bath Spa University take on a creative enterprise project that tests both their academic and entrepreneurial abilities. In negotiation with tutors, students decide which outcomes will be assessed and how (cited in Attwood 2009).

Students' control over their own learning and the motivation derived from this are evident in the task above where students devise the assessment task for their response with their tutors. Creative thinking is required in devising their own entrepreneurial task.

In the University of Cambridge's School of Clinical Medicine, students are tested on their communication skills in a dedicated exam. Trainee doctors are presented with different situations, in which the patients are played by actors, such as having to break bad news to family members and explaining the next stage of treatment to a patient (cited in Attwood 2009).

Teamwork requires students in the task above to develop skills in peer and self-assessment as they negotiate with their teammates. They must also develop and demonstrate flexibility in thinking by placing themselves in the positions of others as they shape communication so that it is appropriate and effective.

## Conclusion

Assessment of student learning is integral to higher education studies. It is important in today's world that students' achievements are certified by assessment. Assessment however, does not operate in a vacuum and to be effective, needs to be positioned in educational programmes that are of quality and prepare students for the world on graduation. Effective assessment tests much more than students' grasp of subject matter and takes students out of the textbook and out of the classroom.

Skills for the twenty-first century mean that students need to be able to think flexibly and develop creative responses to new and emerging issues. This aspect needs to be built into the educational programme and hence assessment, and the assessment needs to be coherently embedded in the education programme, aligned with the key aspects of learning outcomes, and teaching and learning approaches.

Thus, assessment should support learning and is a core part of teaching and learning. Formative feedback is vital in assisting students from diverse backgrounds to appreciate educational expectations and to shape their current approaches to achieve these. It is always constructive in form, and provides guidance for improvement. Finally, assessment needs to foster students' independence in learning and their ability to self-assess as underpinning the ability to respond appropriately to new and emerging situations and issues.

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# Chapter 4 Student Involvement in Teaching and Learning Processes

~ Associate Professor Lucy Bailey and Ms. Vanitha Ponnusamy

## Introduction

Student involvement in teaching and learning has been emphasised in the new millennium, which perhaps could be influenced by the community of millennials in higher learning today. Alexander Astin (1999) developed the student involvement theory which *refers to the quantity and quality of the physical and psychological energy that students invest in the college experience* (Astin 1999, 528). He concludes that students who are immensely involved in their college will spend more time in learning and personal development. Hence it diverges from the traditional emphasis on the subject matter and technique to what motivates and encourages student behaviour towards learning.

This theory is also supported by various researches, such as Zhao and Kuh (2004), whose study indicates that student engagement in the form of participation in learning community to their overall satisfaction with the college. This is also concurred further by another study (Kuh et al. 2008) that student engagement in educationally purposeful activities is positively related to academic outcomes (p. 555).

Based on the student engagement data available from NSSE (National Survey on Student Engagement in USA), James Duderstadt's (a nuclear engineering professor from University of Michigan) asserts that *faculty members of the twenty-first century college or university will find it necessary to set aside their roles as teachers and instead become designers of learning experiences, processes and environments* (1999, 7). The trend appears to be on the rise which encouraged a wider coverage of student involvement in teaching and learning activities.

This paper will report on a series of initiatives that have been recently introduced at the University of Nottingham Malaysia Campus (UNMC). These three measures are student mentoring, students as change agents, and student observers of teaching. They have been on trial over the past two academic years with the shared aim of giving students an enhanced involvement in teaching and learning processes. In this paper, we will begin by establishing the broad educational principles behind these three schemes, and draw attention to their basis in educational research. We shall subsequently describe the three initiatives that were developed on the basis of this research literature. From there, we will move on to evaluating the success of the attempted involvement, citing evidence from a systematic evaluation of the "student observers of teaching" scheme. Finally, we shall reflect on some of the challenges of introducing this kind of cultural change in educational practice at our Malaysia campus.

UNMC has sought to increase student involvement for a number of reasons. It is conceptualised as both an end in itself and as a means to other ends for the institution. Primarily, giving students voice is fundamental to our philosophy of education. Following the Freire democratic tradition, learners having control over their own learning is seen as an educational right (Fielding 2011). However, we also welcome secondary benefits that adherence to this value brings. Researchers have identified two benefits of such initiatives to students. First, is learner empowerment whereby learners are able to use their own knowledge about what is effective to make learning more effective. Second, is the ability of the learners to develop soft skills that complement their academic curriculum through these schemes for empowerment. It is finally noted that student involvement may also bring benefits to the institution itself, whereby happy students may recommend the university to others which can subsequently contribute towards their ranking.

## Background

The idea of giving students voice has been both researched and problematised extensively in the literature (e.g., Rudduck and Fielding 2006; Fielding 2011; Kay, Dunne and Hutchinson 2010). Concepts such as “involvement” and “voice” are not synonymous, and a multiplicity of approaches has been united under such umbrella terms. Zepke (2015) has suggested that moves towards student engagement in Higher Education (HE) have been driven by a neo-liberal agenda, but that reinventing it can lead to an approach that is more compatible with social justice. Other theorists have seen student voice as advancing a progressive agenda; in the UK, there is a strong democratic tradition in schooling (Rudduck and Fielding 2006), and giving students freedom over their learning, and power in their institution of learning has been connected to the development of self-identity and been therefore seen as empowering.

Rudduck and Fielding (2006), in a study of student voice initiatives in UK schools, argue that there can be tensions between the institutional and personal objectives of student voice, and that there can be challenges in ensuring that student voice (particularly of younger learners) is authentic and inclusive. Similarly, in a study of student involvement in learning and teaching initiatives in Higher Education (HE), Felten, Bagg, Bumbry, Hill, Hornsby, Pratt and Weller (2013) have pointed to a danger that certain types of students will be encouraged to participate, whilst others will be discouraged, either implicitly or explicitly. Overall, the available evidence suggests that such initiatives can shift the prevailing relationships within HE (Kay, Dunne and Hutchinson 2010), but equally that they can do in unpredictable ways (Bergmark and Westman 2015).

At the individual level, grand claims have been made for the effects of enhancing student voice. It has been claimed at school level, the effects on children to be as disparate as enhanced motivation, lower dropout rates and the development of leadership capabilities (Beaudoin 2013). At higher education level, the transformative hopes for student voice are also ambitious; leadership skills (Kay, Dunne and Hutchinson 2010) and greater social inclusion and equity (Sellar and Gale 2011) being among the potential effects. Following Fielding (2004), we see student voice as an instance where ideals and realities may not always match. In describing our own recent initiatives below, we will chart how the implementation of projects did not always match our plans, and stress the importance of adaptation to context.

## Student Engagement Initiatives at UNMC

In the remainder of the paper, we shall exemplify the concept of giving students' voice by describing and evaluating three schemes that have been recently introduced at UNMC. These three initiatives have a shared goal of using student involvement in teaching and learning processes to make the teaching and learning experience more effective. The three initiatives discussed below are:

1. Student mentoring — a project to give all new students a student mentor during their first semester, to support their transition to university life.
2. Students as change agents — a system for establishing projects involving student and staff partners in projects that enhance teaching and learning across the campus.
3. Student observers of teaching — a scheme to use trained student observers to give lecturers feedback about their teaching.

It should be noted that the University of Nottingham is not alone amongst British universities in introducing such schemes for example, the University of Exeter initiated the “Students as Change Agents” initiative back in 2007 (Kay, Dunne and Hutchinson 2010). We are not claiming for originality in each endeavour; what we are exploring is the way in which these can be introduced in the contrasting cultural setting of an international campus in Malaysia.

In this section of the paper, we shall briefly outline each of these initiatives, explaining the motivation for introducing each one and our plans to develop it further in the future. One strand that unites these three schemes is the belief that they develop the students' soft skills, in particular their leadership, teamwork and communicative capabilities. For this reason, students participating in each of these are given recognition for their involvement under our employability programme, the Nottingham Advantage Award (NAA). This is a certificate given to students who participate in a range of activities that develop their soft skills throughout their studies.

### Student Mentoring

Studies showed that one of the reasons for the students to fail in a university is due to the inability to cope with the expectations and experiences in higher education learning institution (Bettinger and Long 2005; Bettinger et al. 2011; Rodríguez-Planas 2012; Satyanarayana et al. 2014), and that they need a “nudge” to move forward and face the challenges in such setting (Thaler 2008). This aids the development of both the hard and soft skills of students which consequently equip them for the working world.

In UNMC, the student mentoring scheme was developed to support student transition into undergraduate life. This is a model that closely resembles the apprentice model of education which is essential to provide a platform for learning beyond the classroom (Pascarella 1980; Jacobi 1991). Since it was in a pilot stage, this activity emerged as module under the Nottingham Advantage Award, further information is in <http://www.nottingham.edu.my/CurrentStudents/Nottingham-Advantage-Award/index.aspx>. It is an opportunity for students to stand out, and have a vision to achieve their goals and to be recognised. Numerous modules are offered under NAA which meets the requirement for employability and skills development. Mentoring is offered as a module under this scheme.

As this is a pilot scheme, we have selected one school from each faculty (3 faculties in UNMC). All new undergraduates in participating schools are asked if they would like to be assigned a student mentor from their school, and existing undergraduates are invited to become mentors, subject to approval from their personal tutor. Mentors and mentees are then paired together, with each mentor being given 1 mentee. The task of the mentor is to support the orientation of the new students onto both the campus and the course.

The scheme offers mentees a formal mechanism for seeking support and advice from their seniors during their first semester, and is designed to develop the skills of all participants. Training is provided to mentors on being an effective mentor and on the boundaries to the role. The mentors are to engage a minimum of 8 contact hours with the mentee in a semester. At the end of the semester, the mentee is supposed to provide a feedback to the module convenor (an academic), while the mentors are expected to write a reflective feedback of their engagement in the mentoring activity. Hence, academic faculty is given feedback on the aspects of the first semester that students find most challenging, along with informed suggestions on how to address this.

To date, the scheme only operates in volunteer schools in UNMC. However, after piloting, it will be opened to all schools. The programme is currently led by academics and in the long term, it is expected that it will become independently sustainable, as experienced mentors take on the role of training the next batch of mentors, and the academic role will be reduced to oversight and advice.

## **Students as Change Agents**

This is an initiative to the decision made by Quality Assurance Agency for Higher Education (QAA) in the United Kingdom to include students as members in institutional audit and review teams (Kay et al. 2010). Conventionally, the learning activities come under the purview of teachers or academic faculty, hence the design of a subject and the mode of delivery is done by them (Healy 2012). However, an initiative in 2011 by Bryn Mawr College, USA challenged this and included students to participate as pedagogical consultants (<http://www.brynmawr.edu/tli/>). The results of these activities were positive in terms of active learning of enrolled students, which is seen as necessary for their continuous learning in a higher education institution.

“The students as change agents” initiative sought to give students a more direct impact on teaching and learning developments. Under this, students work as collaborators with members of staff to develop projects that will impact on teaching and learning at school, faculty or university level. Students can develop a proposal alone or through discussion with staff, and all projects must be student-led. Staffs only collaborate in a supportive or advisory role. Both staff and students are guided by the “students as change agents” team. This team provides guidance for change agents and staff, that includes access to Learning Technology and Teaching and Learning Directorate resources, where appropriate. Hence projects need to be submitted to this team for approval. Once approved, the team provides training for change agents and support students who enrol in the Nottingham Advantage Award credit for their project work. Successful applicants are given a range of support to help them to realise their aims, such as an initial training in project management, and subsequent online and face-to-face guidance. At the end, students are expected to submit evidence of the project execution and completion.

“Students as change agents” has enabled students to have a significant and lasting impact on their university experience, and to develop students’ project management, leadership and communication skills in the process. In UNMC, the topics that were chosen are, a project to secure internship opportunities for Pharmacy students, which is to give them a better understanding of gaining internships; and a project from the school of Psychology to seek information on what type of feedback for assessments that students would find helpful in their course of study.

## Student Observers of Teaching

The “student observers of teaching” scheme was introduced as a platform for undergraduate students to give direct and supportive feedback to individual lecturers. It was designed to give lecturers additional information about their teaching methods. This exercise is seen to be very valuable by particular cohorts of students. Prior to the introduction of this scheme, UNMC has an existing general mechanism, or students to give feedback. Each semester, the students in a particular module complete an online survey for Student Evaluation of Teachers (SET) and Student Evaluation of Modules (SEM). At twice a semester, they also participate in Learning Community Forums (LCFs) which is programme-based to evaluate and give feedback on their lectures and any other learning support issues. However, in both cases, the information is used for performance review, and is a summative rather than a formative assessment of a lecturer’s teaching.

“Student observers of teaching” involves a pair of trained student observers watching a volunteer lecturer teach, talking informally with their students, and then providing supportive feedback to the lecturer. The four-stage process of student observations begins with a training programme. Two compulsory workshops are offered to the student observers, covering such issues as active listening, the concept of a “critical friend”, confidentiality, and giving written and oral feedback. After that, a pair of observers are asked to meet with each lecturer, and to ask them what kind of feedback they would like about the session; some lecturers have very specific things they would like the observers to pay attention to, whereas others just want general feedback. The actual observation is the third stage of the process. For this, the observers are provided with a detailed form for noting their observations. This form draws attention to five aspects of good teaching: motivating students; planning and organisation; instructional techniques; activities and materials; and questioning and feedback. However, the observers are instructed only to pay attention to those aspects that were requested by the lecturers and fill up the form accordingly. A sample section from this observation form is provided in **Appendix 1**. The fourth, and last stage of the process is post-lecture meeting between lecturer and observers. Here, the observers share their observations of the session, and pass to the lecturers their written feedback.

Participation in this scheme is voluntary for students and lecturers alike — and lecturers choose which session they would like to be observed. There is no implication of the feedback on the lecturer’s performance review; the observers’ comments and written feedback are confidential. Moreover, the observers and lecturer agree before the observation session the aspects of the teaching upon which the observers will focus. In this way, “student observers of teaching” was designed to be supportive of academics who seek continually to improve their teaching, and to avoid any connotations of surveillance.

## Impact of these Initiatives

Having described these three initiatives, the questions remain whether they have been successful in achieving their stated objectives. As peer mentoring and “students as change agents” had both previously been implemented and evaluated at our UK campus, no study of their impact was conducted in Malaysia. Moreover student mentoring and “students as change agents” are still an ongoing project. It will conclude by end of April, 2016.

On the contrary, “student observers of teaching” was initiated here; it was introduced with a small-scale pilot in the academic year 2014 – 2015, and then expanded in 2015 – 2016. It was therefore decided to conduct systematic, albeit small-scale, research into the impact of this pilot on students and lecturers.

Seven undergraduate student observers from the School of Education, and eight volunteer lecturers from the Faculty of Science and the Faculty of Arts and Social Sciences participated in the pilot scheme. School of Education staff were not allowed to participate, in order to avoid a situation where students were observing their own lecturers. It was explained to all students and staff involved that the pilot scheme would be evaluated, and their informed consent was sought. An optional focus group was conducted with the students after the end of the module; all the students participated. An individual interview was held with each participating lecturer except one who agreed to be interviewed but was unavailable.

## Lecturer Feedback

Overall, the lecturers were positive about the experience, although they also suggested improvements to the scheme in the future. The lecturers’ reasons for choosing to get involved in the scheme were disparate; for some, the attraction was in providing an impetus to change stale teaching habits, whereas for others, it was an opportunity to work on a new craft:

“So I was thinking yeah, it’s quite a while since I’ve been observed, you do pick up bad habits when teaching.”

“When I got the email inviting participants to come and be observed, I was quite keen just to get some feedback because it’s my first semester of teaching.”

From the pilot project, it seemed that lecturers at all stages of their teaching career felt that they could benefit from being observed. The lecturers described the ways in which the student observers had helped them. The observers had focused on positive aspects of their teaching, which they found helpful and affirming:

“I had just started here, and we had a heap of issues and I was trying to...as far as I was concerned, I was giving everything to my teaching, but I just wanted to make sure that it was going ok. So, yeah, it was encouraging; it was affirmative, actually, at that particular point.

“I think it’s a good scheme. Some of my colleagues were a bit surprised I was doing it. I’m not sure why, whether they found it a little more intimidating than it was. So I was possibly regarded as the departmental guinea pig. So you’d be glad to know that I would report back to say that it’s completely painless and actually quite a good thing to do.”

The lecturers felt that this kind of personal discussion was more helpful to them in improving their teaching than only surveys like SETs that the students fill up at the end of each semester:

“Sometimes I find that my SETs are not very helpful. Because ...they complain about my voice. And I’m like, okay, so you think my voice lulls you to sleep after a while, but that’s not really helpful. I’d rather get things that I could work on.”

“I always have bad SET scores, I don’t know why, but this is much better because they were observing from a totally different point of view and they were independent from the class because they were not part of it. And I felt, yes, this is complementary to the SET scores.”

However, there were some reservations about some particular aspects of the scheme. For example, some lecturers would have preferred to be observed by someone who understood their subject, whereas others preferred an outsider’s eye. Some of the lecturers would have preferred a series of observations, rather than an isolated snapshot. Moreover, some of the lecturers did not like the observation sheet, and would have preferred that it is not used at all:

“I think that by having the scoring bit (on the observation sheet), it might risk people feeling judged and worrying about the number they got in the end, rather than actually having discussion and enjoying the process.”

By contrast, other lecturers found the observation form valuable:

“It was interesting to see all the parts of the form. In fact, even the form alone gave me quite a number of ideas, because I was like, oh, I didn’t do that, I didn’t do this.”

In summary, there are lecturers who are open to this idea and willing to use this activity in a constructive way to improve their teaching. Also, it was decided in light of this feedback, to make each of these aspects of the scheme optional in the future. So, lecturers are asked if they have a preference for observers from their own faculty, how many observers they would like, and whether they would like the observers to use the form.

## Observer Feedback

All of the observers were highly positive about the experience of being involved in this scheme. They felt like it was a privilege to be asked to give this feedback, hence the observers enjoyed and were grateful for the opportunity. Nevertheless they were also thankful that they had not been expected to observe their own lecturers. They identified three main ways in which they felt that they had benefited from the experience.

### 1. Benefits of learning to give and receive constructive criticism

At the start of the module, the student observers had thought that their job would be to point out ways in which the lecturers could improve. The training was focused on helping them to reflect on other ways to support improvement:

“I found it very exciting. You know, I think it’s like the best module ever. Seriously, I think I learned so much from this because I think as teachers, we really need to give feedback and often times, we don’t know how. So I think this taught us really how to not just criticise people but let people think and reflect on their own teaching.”

The students also felt a lot of respect for the lecturers who had volunteered themselves to be observed in this way. They saw this as a strength of those individuals:

“The first time I signed up for this module, I just wanted to get the credits. That is basically my initial purpose of this module. But at the end of it, I think I have learned a lot of things. The most important thing I learned is basically you have to be very open-minded. You have to prove yourself and also to allow people to criticise you, and also give them opportunities to be more critical.”

## **2. Learning to communicate with unfamiliar senior figures**

For nearly all the students, the communication skills involved in this experience were demanding. They saw academics as authority figures, but were expected to establish a dialogue with them as equals. This enabled them to develop confidence in such communication that will be valuable to them in the workplace:

“I think I’m a bit introverted especially when it comes to talking to lecturers. So speaking with lecturers in our school of education is okay, but speaking with lecturers from other schools or departments that I’ve never talked to is very intimidating. But I think through these post-meetings, I’ve never realised that I’m not that afraid of talking to them at all.”

## **3. Preparation for teaching**

As all of the observers in the pilot were undergraduates in the School of Education, they received an additional benefit in being able to see some of the challenges they might face when they begin their career in teaching:

“Both of the lecturers that we observed were really young and both told us that it’s like they’re very new to teaching in the university. They honestly admitted that they were a bit nervous, especially when there are people observing, despite the fact that we were just students. We were not there to assess them or anything. It exposed me to how I would probably be like when I leave and I graduate and I’m going to teach. I’m going to be the same. Through this module, I sort of know what to expect when I step into the classroom.”

In summary, the observers felt that the scheme had been beneficial to them personally, and that it had enriched their university learning experience. They had also enjoyed the opportunity to attend lectures from different disciplines, thus exposing them to a wider range of knowledge available.

## Challenges in Implementing these Initiatives

Overall, the university has introduced, and enjoyed a collaborative success with students in such initiatives. Students have a stronger voice in matters pertaining to their learning activities in the university. Despite such positive outcomes, there have been challenges in implementing these initiatives.

Firstly, these initiatives have added to the pressure of time on both academics and students. Supporting a student change initiative, or being involved in the student observers scheme, consumes a lot of time of participating lecturers, and a large time commitment from those given coordinating roles. The intention is therefore to make these schemes as sustainable as possible, with student participants in one academic year becoming the student coordinators in the following year. Students' engagement in teaching and learning also requires commitment and accountability, hence it is essential for them to lead such activities. They will need to manage their time, an unintended consequence of such engagements!

Secondly, as Kay, Dunne and Hutchinson (2010) pointed out when reporting on the “Students as Change Agents scheme” at the University of Exeter, these measures raise fundamental questions about the relationships within higher education. Contrary to Zepke's (2015) suggestion that student involvement tends to serve a neo-liberal agenda, the experience in UNMC has been mixed. The experience of being involved in such initiatives are seen by students as empowering, hence raising their confidence level to be able to communicate and correspond to academics in a more equal ground. “Student observers of teaching”, for instance, challenges established hierarchies and conceptions of expertise in higher education. In addition, these measures provide a challenge to the neo-liberal conception of students as customers, as they move from being mere evaluators and purchasers of a product to co-producers of that service. We can expect it to take time before the implications of this shift fully manifest, and a degree of discomfort with the transition. Any transition is not devoid of chaos and adjustments which will be the norm in this situation as well.

Thirdly, mentoring activity that was conducted here is peer mentoring hence it will require trials, and learning from mistakes in order to construct better training programs for mentoring. The senior students are not experts in mentoring activity, hence can have different perspectives on mentor's roles and how to play such a role (Colvin and Ashman 2010). Therefore, regular trainings or a platform for mentors to congregate and discuss on the mentoring issues, with an experienced mentor present will be crucial in the future. Such sharing can try to narrow the different perspectives in order to have a more streamlined understanding for implementation. Boundary settings also need to be included in such activities so that the mentors constantly be reminded of it, and do not breach it. We have yet to see the content of the reflective journal in order to further comment on this activity.

Lastly, it is important to acknowledge the influence of “cultures of learning” (Jin and Cortazzi 2006) — those taken-for-granted assumptions about what learning is and how it takes place that are in fact culturally-embedded, which may affect how schemes such as these can be introduced. Confucian approaches to learning, which emphasises deep reflection on knowledge as respect for the teacher, may inhibit students from engaging in critical discussion as “student observers of teaching”, for example. Jin and Cortazzi (1998), in a comparative study of the contrasting expectations of Chinese and British school students and teachers of what constitutes “good learning” and “good teaching” suggested that the Chinese teachers stressed the importance of knowledge, whereas the British teachers stressed the importance of skills. For the Chinese

students and teachers, a lack of knowledge involved a loss of face, so these students would often ask questions after class rather than risk shaming themselves or their teachers. For the British teachers and students, there was no loss of face in showing a lack of knowledge, so that questions were more likely to be asked during class. Jin and Cortazzi (1998: 54) suggest that students in multicultural classrooms “learn about learning while learning”.

We acknowledge that these cultural differences in learning may pose some challenges for implementing student engagement initiatives in an international university. If many of our students have been expected hitherto to be absorbers of knowledge, the shift to a university setting in which they are expected to innovate reflectively in learning and teaching may require a major adjustment. However, we would suggest that this means that the schemes need to be adapted to cultural context. In Jin and Cortazzi’s (1998) comparison of British, Chinese and Japanese learners, each group of learners was active, engaged and critical, but these were expressed in different ways, as appropriate for the contrasting cultural contexts. Returning to Rudduck and Fielding’s (2006) concern about inclusivity in student voice, sensitivity to cultures of learning is integral to ensuring that such initiatives can be genuinely inclusive in a multi-cultural institution.

## Conclusion

This article has reflected on a range of initiatives at UNMC that have enhanced student involvement in learning and teaching. These early evidence suggests that these initiatives have enabled students to have a voice in continual improvement of the academic part of their student experience. They have offered detailed, qualitative feedback to academics about what students want. And through mentoring, they are learning soft skills in cultivating, nurturing and motivating new students which is not only instrumental for adjustments in university, but also as an added value in the workplace later. Finally, they have enabled students to develop a range of skills that complement their academic learning outcomes. In multiple ways, then, and with a need to adaptability to the multiple cultural contexts of learning (Jin and Cortazzi 1998; 2006) represented in our institution, these initiatives have been successfully implemented in Malaysia.

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## Appendix 1

### Sample section of the Observation Form

Section 3: Instructional Techniques	Rating				
1. Provides variety of teaching techniques (e.g. visual representation, concrete example, media) to aid learning and understanding of content	1	2	3	4	5
2. Models performance expectations	1	2	3	4	5
3. Uses concise communication	1	2	3	4	5
4. Activates students’ prior knowledge and relates new learning to what they know	1	2	3	4	5
5. Session is student-centred (e.g. students are engaged in constructing knowledge through exploration and interaction)	1	2	3	4	5
Comments					
Section 4: Activity & Materials	Rating				

# Chapter 5 Technology Supported Pedagogy in Higher Education: Approaches and Trends

~ Professor Madhulika Kaushik

The greatest wrong, the greatest treason, is to do the right thing for the wrong reason.  
~ T.S. Eliot (1888 – 1965) *Murder in the Cathedral*

## Abstract

In the digital age or the K-economy as our times are referred to, we are all surrounded by or supported by technology in almost all aspects of our lives, including the way we learn, communicate or relate to each other and to our organisations. The development of the last few decades demonstrates clearly that the rate of technological change is accelerating instead of slowing down. Majority of our higher education institutions, however, were built for the learning needs and behaviours premised on the requirements of the industrial age rather than the digital age. Fortunately, the affordances provided by technology, in terms of improved access, lower costs, interactivity and possibility of improved quality and the rapidly changing nature of the learner populations are forcing academics and education technologists to evolve pedagogies and learner support applications with a better degree of fit with the evolving times.

This paper is aimed at presenting the trends in technology-supported teaching learning processes and the approaches used by higher education institutions to add value to the knowledge creation, curation, distribution and sharing with their learners, as well to support learners through their academic life with the institution. As the World Wide Web and fast-paced networks make ubiquitous learning a very real possibility, digital scholarship on an individual basis with learners taking different courses from a variety of providers is a trend developing fast. Online learning, flexi learning, mobile learning, OER and MOOC, collaborative platforms supporting peer-to-peer learning and co-creation of knowledge supported by learning analytics, are some interesting developments of our time that could lead to transformational changes in the way higher education institutions conduct their core activity and view the scope of their markets. The changes in pedagogy approaches are already becoming visible; accreditation, assessment and widely accepted certification remain as thorny issues. The paper briefly looks at the implications of the technology-supported pedagogies for users and stakeholders.

## The Changing Landscape in Higher Education

The advent of digital technologies in the last two decades has dramatically changed the world, perhaps irreversibly, transforming the way we communicate, access and process information, bank, shop and manage our work lives. Like in other spheres, these changes have had major influence on the higher education landscape impacting the size, scope, markets, target consumers and the core business of teaching, learning and assessment. The good news for higher education sector is that the changing nature of the global economy from a manufacturing to service

economy, and now to a knowledge economy has fuelled the need for post-secondary education and the demand for higher education is rising fast. Some of the major influences are seen in the form of:

**Demand surge** for higher education. The demand for higher education is exploding: from 150.5 million tertiary students globally in 2007 to 165 million in 2012, and expected to reach 263 million by 2025. Globally the relevant age participation in higher education grew from 19% in 2000 to 28% in 2009. In OECD countries, between 1995 and 2012, it grew 25%, reaching 40 – 45% in 2012 (OECD 2012).

**Participation:** This overall pattern of rising participation rates in Higher Education (HE), however, encompasses wide variations in relevant age group participation across regions: from 40 – 45% in OECD countries to 25% in the Caribbean, under 15% in South Asia and just under 10% in Sub Saharan Africa.

**Demographics:** In addition, the average age of the learners is rising as a substantial proportion of them now come from the workforce requiring relearning. The rapidly changing workplace has made lifelong learning a critical determinant of growth and effectiveness of the workforce.

**Digital scholarship:** By far, the biggest shift is in the way learners, empowered by the new massifying technologies are increasingly taking control of their own learning as proactive managers and indeed producers of their own learning solutions, portfolios and materials. The term learners is used here to denote all “users” and is inclusive of the young degree aspirants as well as workplace-based adult learners.

As learners begin to exercise individual choices about what courses to take and from where, in the face of world class education becoming accessible and often free, HEIs need to carefully evaluate their strategic direction in attracting and retaining students. Amongst their findings regarding learner choices, Beetham et al. (2009) report that learners want meaningful choices about how they learn, with and without ICT, and that “many learners use technology to multitask, while some find being online a distraction from study.... Learners are creating their own learning spaces, blending virtual with face-to-face, and formal with social. Informal collaboration is widespread, often facilitated by technology that is under learners’ ownership and control” (p. 24).

**Digital literacies** are fast emerging as part of the 21<sup>st</sup> century skill set required for effectively navigating learning and it would be incumbent upon higher education institutions to plan for the development of digital literacies among their adult learners as well as faculty.

**Reach and scale:** The ubiquitous nature of the digital technologies that facilitated online learning, also made boundaries and national jurisdictions irrelevant and the market reach for HEIs is now limited only by their capacity to serve learner populations irrespective of the geographic location. This development alone has far reaching implications for massification of higher education, in turn supporting globalisation, learner motilities, trends in digital scholarship and of course developments like the MOOCs.

**Social media:** The fast paced development of social media added another layer of opportunities for collaborative learning and networking to be mobilised for HE, specially for group-based learning and projects requiring group participation over time.

**Dominance of private initiative:** Changes are also apparent in the way education is being organised. Share of private sector will continue to grow as private higher education is emerging as the fastest growing segment in HE accounting for 46.6% of the total enrolment in higher education globally (<http://stats.uis.unesco.org>). Helping to drive such growth at both the national and international levels is the private equity which views technology as an enabler of reach and efficiency. More efficient institutions will reap benefits of this churn and private institutions could lead the adoption of change as has been demonstrated in their faster transition to online education in comparison to public universities.

Overall continuing trends marked in higher education by Johnson et al. (2015) NMC Horizon Report included the following 6 trends as follows:

1. Advancing cultures of change and innovation (long term)
2. Increasing cross institutional collaboration (long term)
3. Growing focus on measuring learning (midterm)
4. Proliferation of open education resources (midterm)
5. Increasing use of blended learning
6. Redesigning learning spaces

Based on the above developments, it is clear that the nature of pedagogy in the university has shifted. A growing emphasis has been placed upon student-centered learning, and upon group work and collaborative forms of assessment. These changes have driven a vast demand for the learning spaces which foster and support emerging forms of learning activity. It is worth noting that this shift has not replaced, but has generally supplemented conventional forms of student learning.

## Technology as the Enabler and the Related Affordances for Pedagogy

The interest of higher education providers in technology stems from the opportunities that get opened up for access, scale, closer customisation to requirements, and flexible pedagogies that can be applied for diverse teaching learning situations.

Technology-enhanced-learning, considers the use of Information Communication and Technology (ICT) in its widest sense to support and improve the learning experience. Thus flexible pedagogies and technology may be considered natural partners — flexible learning can be provided by and supported through technology, while conversely, technology can encourage flexible approaches to the delivery and assessment of learning. They also share the requirement that truly flexible pedagogic approaches and effective use of technology in education (e-learning) call for adaptable institutional systems, staff and students (Gordon 2014).

The affordances provided by technology can be applied to improve existing systems for learner support, assessment, and performance enhancement as well as to explore new opportunities in terms of different products to offer, access and reach new markets, and dramatically increase the size and scale of operations by a given institution. The meteoric rise of open universities into

mega universities has partly been on account of appropriate technologies and media applications made by these institutions to access and serve underserved populations. The transition that we observe today towards MOOCs is a natural progression of the open movement towards higher education put in motion by the open universities.

Some of the affordances enabled by technology, as per the study conducted by The Milken Exchange (Willis and Raines 2001) that have been put to use in higher education include but are not limited to the following:

1. By creating an environment of round-the-clock connectivity, technology can enable the learners unlimited choices in terms of their pace, place, time and mode of study, making available numerous ways to access resources and information, and opportunities to interact with teaching staff and fellow learners. For the provider institution, technology can support and accommodate the requirements of diverse learners and enable the flexibilities required for the same.
2. As content and information become available in the public domain, technology choices can provide a powerful catalyst to teachers to rethink of their role as facilitators of learning and further inquiry by the learners, rather than being provider of content and usable information.
3. Through the information flows made available about the access and usage behaviour of content, analysis of learner queries and performance outcomes, learning analytics can lead institutions to make informed choices about effective pedagogies and assessment mechanisms.
4. Technology can be a wonderful link between academics and emerging practices in a host of professional fields, by becoming a real time bridge between professional practices, research and application.
5. Technology can dramatically increase the viability of students in the workforce, the skills acquired making them more employable and professionally productive.
6. Technology can be a great tool for motivating and engaging students, not only seek knowledge but also to contribute in producing knowledge.
7. Technology can strengthen teaching, providing teachers with a powerful learning tool which promotes individualised instruction and customised attention to individual or group learning behaviour.
8. As Internet-based pedagogies have the potential of creating and supporting learning exchanges of anywhere between the institution and the learner, provided the learner is connected to a good broadband connection, institutions can think of worldwide markets and unlimited learners, based on their capacity to effectively serve the learner populations.
9. Collaboration in research and academic activity have always characterised good higher education institutions. Technology has taken these opportunities deeper into the field of developing collaborative programmes, offering collaborative and team teaching, and enabling usage of off-campus faculty expertise between institutions.

10. Technology has also enabled imaginative assessment practices, by facilitating tracking of learner progress throughout courses/programmes, fostering customised feedback and supervision.

## Innovating Pedagogy for the Digital Age — Trends and Readiness

Responding to the changes discussed above and the rapid proliferation of technology in all aspects of our life, fairly fast-paced changes have characterised the last two decades in the higher education space. Some of these like MOOCs, have been termed as disruptive innovations on account of the potential for disruption they have for the status quo, but each of the developments has the potential to substantially change the way we have been conducting the core business of teaching, learning and critical inquiry in higher education. In the interest of time, we will in this section talk at some of the most prominent developments. This by no means diminishes the importance of developments in pedagogy not discussed here. As you would notice, the evolving pedagogies reflect the six overarching themes of scale, connectivity, personalisation, reflection, extension and embodiment that characterise the affordances created by technology in the last few decades.

### Blended Learning

With the increasing popularity of online learning and the recognition of the value that it might bring to both face-to-face and open learning environments, higher education institutions have begun responding by incorporating features of Internet-based teaching into their conventional teaching modes as well as in the ODL mode. This pedagogy approach, which draws upon the best features of face-to-face learning, online learning and practices in ODL, is gaining popularity by the name of blended learning. The appeal of blended learning lies in the fact that it enables providers to determine and select the desired blend of face-to-face, online and self-instructional modes depending upon the target learners and the resources that can be mobilised. Different programmes could have differing mixes of the component modes and be customised to the requirements of a given teaching learning situation. The affordances include flexibility, ease of access, integration of sophisticated multimedia and interactive technologies including some forms of continuous assessment.

Conventional universities experimenting with blended learning found the approach to be more effective than using only face-to-face or only online learning (King 2014). At the University of Illinois, research showed that effective blended learning requires the faculty to find and apply ways to stimulate learner engagement and critical thinking in an online environment, as well as the ability to support different learning preferences of the learners. Classroom teaching was followed up by online supporting materials and discussion forums, which according to the learners, made instructors more accessible and the communication most persistent when virtual environments supported face-to-face instructions (Illinois Online Network 2015).

There are, however, important implications for careful course design, from conceptualisation to execution, followed by candid feedback to enable a continuous improvement and determination of the appropriate blended learning model. One of the more exciting possibilities offered by blended learning is that of personalising learning to suit learning preferences or learning capabilities of individual learners, moving away from a one-size-fits-all approach in more traditional methods.

This is accomplished by allowing for flexibility in content according to a student's needs. The key requirement here is that material can be organised into a hierarchy of complexity, allowing students to choose what they access at a certain level, but possibly with points where progress is assessed, and there is some kind of check-in place to stop them accessing more complex material. This type of approach can be considered as providing a flexible learning pathway based on learning capacities.

The possibility of personalised learning is augmented by flexi level and adaptive testing. Auto generated tests based on analysis of test data can allow for multiple testing opportunities as well as open book environments as the test material has been customised to individual learners.

## MOOCs and Badges to Accredite Learning

MOOCs or massive open online courses have dominated headlines in the educational spheres for almost five years now. They have been labelled as a true game changer and the harbinger of the era of real mass education. While some enthusiasts view MOOCs as a disruptive innovation in higher education, a more comprehensive view enables educators to see MOOCs as a progression on a continuum from distance education to online education, to open and online education using OER, and to mass-based applications of open online education. The 2012 Innovating Pedagogies Report 2013 described MOOCs as “open access online courses that provide no constraint on class size” (Sharpley et al. 2013)

A typical MOOC is often free, may involve from 4 to 10 weeks of “teaching learning exchange” online where most of the time is allocated for the learning, and the final week or fortnight may be dedicated to the production of some work in the form of a project or a report or even a video. Participating learners have reported spending 4 to 6 hours a week on the course; the more engaged learners reported spending much more time. The learning materials placed on the MOOC platform are in the form of recorded lectures, videos, text material and are generally found to be consumed in diminishing proportions as the course progresses. The resources posted remain available after the course has closed. Course participant could be tens of thousands while those completing may be a few hundred or a few thousand.

Based on the approach to teaching used, two classes of MOOCs have been distinguished:

1. cMOOCs (“c” stands for the connectivist educational theory that inspired the development) which are run on open source learning platforms and are offered by academics as part of their assigned teaching activity by their own institution. Their pedagogic model is based on peer learning, and the courses are typically “built around a group of like-minded individuals” keen on exploring new pedagogies beyond the traditional classroom setting (Yuan and Powell 2013). cMOOCs are today associated with the institutions that pioneered them, such as Athabasca University and the University of Manitoba.

2. xMOOCs on the other hand, represent the online version of the traditional instructional model using lectures, instruction, discussions, mostly asynchronously supported by video presentations, short quizzes and tests. The learning transactions typically take place on proprietary specialist software platforms owned by third party private enterprises. xMOOCs therefore feature contractual and commercial relationships between universities as content providers, and technology companies as facilitating learning platforms. The three major providers today include edX, Udacity and Coursera.

UKOU's FutureLearn MOOC initiative proposes to combine the features of both types of MOOCs in its bid to benefit from the two approaches.

There are now components of MOOCs that are fee-based, usually for the assessment and accreditation complement. Some providers have taken to issuing badges to accredit learning which are usually issued by the course instructors and not necessarily by the university associated with the course.

There is a general consensus about the impact of MOOCs on higher education being enduring and long standing, at least in terms of the reassessment and examination of the existing approaches that this development has fostered. MOOCs for the provider institutions bring the advantage of unlimited access, brand extension, learner recruitment, experimentation and innovation as well as revenue augmentation.

There is also a general consensus among academics on the jury still being about on the value of MOOCs. The chief controversies are about learner completion rates, learner support, models of evaluation used, as well as the equity and access aspects in developing countries, where the digital divide may be creating an even more unequal access to higher education offered through MOOCs.

## Flipped Classrooms

Flipped classroom represents an interesting application brought about by merging the learning value in both online and face-to-face interactions. In this approach, direct teaching is taken outside the classroom and put online on the learning platform using lecture videos and presentations, enabling the learners to learn at home or their own personal space anywhere, by interacting with the materials. The classrooms or personal interaction time is then allocated for dynamic interactive learning where the teacher facilitates application of concepts learned by the students on their own, guides peer-to-peer interaction and creative engagement with the subject matter through individual or group projects, analysis of situations using role play or other participative activities.

The learning materials, require to be posted online much before the interaction session, may be prepared by the instructors themselves, or use of third party material like the Khan academy can be creatively made depending upon the learning task at hand. While the material supplied could consist of textual material and multimedia content, short videos seem to be the most popular mode, looking at the available trends.

The effectiveness of the flipped classroom pedagogy is highly dependent on how creatively and effectively the interaction sessions are planned and executed. The focus is usually on the shift towards collaborative and group learning, and the interaction sessions are planned around encouraging group debates and discussions, executing group projects and exercises, and at times peer mentoring with learners taking the role of mentoring others in their group.

In the flipped class classroom approach, the onus of learning shifts on to the learner and the teacher's role, according to the pioneer Jon Bergmann, transforms to being of facilitator of learning rather than a transmitter of content. Coupled with the OER availability, flipped classrooms could provide an effective methodology of freeing up teachers' and interaction time from content creation and delivery to provide effective individual and group interaction, practising simulation and situation-based learning as well as peer learning.

## Flexible and Personalised Pedagogies Through Bring Your Own Devices (BYOD)

A large proportion of learners now own and ubiquitously use mobile devices like smart phones, tablets and laptops which they expect to carry along with them into the classroom both to facilitate learning and to take notes, share material and access content for their classwork, assignments and projects. This trend has created new opportunities for educators to use mobile devices for innovative teaching learning practices. Teachers can now be unburdened as content deliverers to be effective choreographers of technology enabled, networked learners who are connected to diverse sources of learning as well as to other learners and their teachers in real time. The use of mobile devices as learning tools has the interesting potential of integrating learning within the class with learning opportunities beyond the classroom.

Based on the degree of flexibility that institutions are willing to exercise, BYOD approaches vary from institutions supplying devices to creating a range of possibilities to accommodate the devices owned by the learners themselves. With the use of BYOD approaches, a general shift has taken place in the teacher's control of technologies to be used for teaching learning. Traditionally teachers used to allocate and control the use of technologies, from Computer Labs to electronic board for teaching-learning transactions. BYOD has created the provision of accommodating a range of usable options as long as these are accessible to all learners. Online polls on quizzes can be posed by teachers to be instantly responded to by learners using the devices, learners can raise issues and interaction with both teachers and peers to create and benefit from a networked learning environment, increasing availability of sensors on mobile devices can be used to foster science projects, and enabling lab level accuracies without the expense of maintaining one.

## Learning Through Storytelling or Narrative-Based Pedagogies

Learning through storytelling has a long and rich history. Narrative pedagogy was developed within the field of nursing education and used as a community practice to enable the learners and their teachers to critically consider what was possible and what was problematic within their teaching and practice subjects, providing the participants with an opportunity to listen to and consider a variety of viewpoints. Knowledge could be contested and uncertainties explored with the help of the different narratives presented with little in the subject taken as being certain.

While narrative pedagogy took place in a real-world environment, technology today provides an opportunity to use the narrative-centred learning environment in a make-believe, virtual world where guided learning can take place in simulated situations. These environments could be created as virtual reality (second life), augmented reality or a game-setting environment. In each of these settings, learners are creatively placed within unfolding narratives that require them to ask scientific questions, design experiments, suggest solutions, make assumptions, generate and test hypotheses.

Tasks are creatively set up and progressive levels of difficulty present a challenge for learners, providing stimulus for learners to continuously explore the virtual environment created for them to be able to find solutions for the task at hand. The student is generally in control of his own learning route, often through experimentation in finding a solution, with the fantasy elements making for imaginative and creative applications of the concepts learned.

Another application of the narrative-centred learning environment is a Practomime, which involves “playing pretend in a context where everyone agrees that playing pretend is what you do”. By blending elements of role-playing games and alternate-reality games, learners are prompted and guided to produce creative solutions to problems (Ballestrini, Travis and Slota (2010) cited in Sharples et al. 2014)

## Web 2.0 Supported Pedagogies

“Web 2.0” is an umbrella term for a host of recent Internet applications such as social networking, wikis, folksonomies, virtual societies, blogging, multiplayer online gaming and “mash-ups”. It is also referred to as Edu 2.0.

Web 2.0 marks a distinct break from the Internet applications of the 1990s and early 2000s, facilitating “interactive” rather than “broadcast” forms of exchange, in which information is shared “many-to-many” rather than being transmitted from one to many. Web 2.0 applications are built around the appropriation and sharing of content amongst communities of users, resulting in various forms of user-driven communication, collaboration, content creation and recreation. Commentators now talk of a “read/write” web, where users can easily generate their own content as well as consuming content produced by others (Stutzman 2005). The most common examples include Wikipedia and Flickr.

When directed at learning, Web 2.0 impacts on the following four principal dimensions of the learner’s experience:

1. Collaboration (social dimension)
2. Publication (social dimension)
3. Literacies (cognitive dimension)
4. Inquiry (cognitive dimension)

Much of the learning potential of Web 2.0 is seen to derive from the co-construction of knowledge. A constructivist ethos lies at the centre of practices such as folksonomies, mash-ups and wikis, as well as being a central tenet of popular Web 2.0 philosophies such as “Smart Mobs”, “We Think” and the “Wisdom of Crowds” (Maloney 2007).

Web 2.0 technologies can be particularly effective in supporting team/group work activities where managing the time and place for campus-based meetings could be impractical for online and/or distance learners.

## Gamification of Learning

Gamification, or the application of gaming techniques, can be a powerful tool for delivering education and training in subjects that require strategic planning, scenario building, stimulating and evaluating alternatives, as well as developing imaginative and creative solutions under defined constraints. As a pedagogy application, games allow the freedom “to think outside of normal parameters, to add a little bit of fantasy or surrealism, and to force people to think in different ways” (Kapp 2012).

Games are abstractions of reality, exhibiting only certain characteristics of real life and abstracting the others to create the setting of the game and a different reality. The players are constantly motivated to achieve a particular goal because of the element of challenge that pushes them in a competitive setting. The reality in the game is structured by the rules that also determine the interactivity with others between the players, and between the players and a game system. The game behaviour of the players is guided by the positive and negative feedback resulting from their actions. The emotional reactions or choices of players vary depending upon their interactions with or responses to the different aspects of the game. Since the game is a system, all of these components, actions, reactions, feedback and counter action influence each other as well as all the players. A critical component of the game is “game thinking” which represents the conversion of activities into opportunities for learning and critical thinking. Specially for corporate education settings, gamification provides an intensely engaging and motivating form of conveying complicated concepts and applications.

Games have achievement goals, which add purpose to the players’ experience. To attain goals, players must follow different types of rules. “Operational rules” tell players how to advance through and succeed in a game; while “implicit rules” or “behavioural rules” advance the proper interactions among players; and “instructional rules” embody the information players should learn from playing the game. Significant learning takes place through simulated role plays with players often competing with each other or may be required to cooperate in groups based on the requirements of the game.

Games are usually set at three levels of complexity, requiring players to advance through the different levels based on the achievement and performance. The elements of challenge, relevance, control confidence and fantasy are incorporated to motivate the learners. The best games involve the use of both intrinsic and extrinsic motivations. Research shows that measurement achievements prove to provide a higher motivation than completion achievements. Gamification has been found to be effective in imparting application, conceptual and procedural knowledge.

The two main models used in designing instructional games are the ADDIE model and Scrum, both requiring intense team effort.<sup>1</sup> The best instructional games, however hybridise the two models.

## Learning Design Informed by Analytics

Learning analytics involve the collection, analysis and reporting of large datasets relating to learners, their context and of the learning behaviour across a course. Analytics enable visualisations and recommendations designed to influence student behaviour while a course is in progress.

Current developments are focused on three areas: understanding the scope and uses of learning analytics; integrating analytics into existing courses; and expansion of learning analytics to inform decisions on pedagogic approaches to be applied.

The application of technology-supported tools like virtual learning environments, learning management systems and online assessment has made it possible to continuously collect data about learners, their learning activities and behaviour regarding preference of media, enquiry and queries, information search and utilisation processes, assessment and achievement on various outcomes. Insightful analytics, carefully designed to provide data and therefore answers to questions like what media could different learners respond to, what media would suit best for different concepts and applications, what forms of assessments provide the best measurements and how do these vary across learners and levels are now being applied to designing learning packages and components of courses, as well as assessment based on the actual information about learner behaviour. The important thing to remember is that analytics are based on questions that do not emerge from the data itself, but from a clear conceptualisation of models of learning being implemented and a follow through of what impact each component of the model may be creating for learner behaviour. Big data, enabled by the learning platforms in use now make it possible to use some of the real time information to inform pedagogy practice.

In the USA, the STEMscopes Online Science Curriculum is currently producing visualisations that reflect the activity of 50,000 teachers and over a million students (Sharples et al. 2013). The aim is to produce analytics that are not only grounded in pedagogy but that can also incorporate experiences such as student inquiry and hands-on experiences that are not currently being recorded.

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<sup>1</sup> ADDIE is an acronym to represent the sequential process of analysis of the problem that forms the subject matter of the instructional game, design of the instructional objectives, development — the actual programming of the game, implementation and evaluation. Scrum on the other hand, involves a team meeting every day, with each team member responsible for developing his component of the game. At each meeting, every member updates the development of his part and the whole game evolves through successive meetings, concurrently.

On the basis of early uses that are being made of use of learning analytics, educators have been found to have use analytics for monitoring the learning processes and identify problem areas, content wise; identifiable indicators of success or failure and dropout, assess the usefulness of learning materials and different learning media, use analytics-indicated opportunities to intervene and advise, and use the knowledge made available to analysis to improve both the content and the learning environment (Sharples et al. 2013).

Learners on the other hand, can apply the information supplied through analytics to monitor their own progress, achievements and learning progress.

## Maker Culture

Educators, concerned about the disinterest of learners in the STEM subjects in formal educational settings, have become attracted to the maker culture, which represents a “learning through making” approach, much like the apprenticeship. This approach applies a more participative approach to learning by involving learners in creating objects and artefacts relevant to their own learning or life, and in the process becoming familiar with the concepts used in creation, engineering, and innovative solutions. As a process, the approach emphasises experimentation, innovation and the testing of theoretical principles applicable to the given problem. Collaboration and participation are encouraged, and creativity in the use of different materials or different techniques is encouraged.

Artefacts are formed through a creative process that emphasises immediate feedback, through the production activities themselves: rapid iterative development involving the immediate testing and building of multiple prototypes. The easy availability of software and hardware tools previously only available to corporate organisations and academic research labs has encouraged the development of maker culture with freely available web tools enabling easy communication and open source software, and cheap sensors facilitating frequent experimentation and testing. The maker culture showcases largely self-organised social learning experiments that have become popular worldwide and could have high impact implications for informal learning environments like museums, libraries and other community-based learning settings.

## Crowd Learning

Crowd learning approaches represent the informal learning practices supported by the power of ICT and the prevailing culture of 24/7 quest for knowledge. It involves harnessing the support of many to satisfy the knowledge needs of many. As opportunities for anytime and anywhere learning multiply, and digital scholarship makes independent learning the norm rather than the exception, it also makes sense to multiply the sources of learning to involve large number of people who may be willing and able to share the knowledge that they possess. One good example of crowd learning is the Stack Exchange website, where the seekers of knowledge are invited to ask questions, indicating the type of answers they expect and also relating what they have already tried to gauge and know.

The open platform then enables respondents to provide answers that are more closely tailored to the learning needs of the seeker. As multiple experts provide a variety of responses to the questions, different approaches to the resolution of a problem can be explored. Critiquing of the various answers allows for the evaluation by the user of information with the solutions

sometimes taking the form of a detailed tutorial on the application to the problem. The open nature of the platform and the recognition of effort by the use of badges and reputation markers encourage further inquiry and quest of knowledge in a variety of related areas.

In language learning practice, Lingobee uses international students in the process of improving their language vocabulary by encouraging learners or native speakers to add a word, a definition and a picture of a colloquial use. Other common examples of crowd learning include the iGate, the Forvo online guide, and PeerWise Online Learning tool that allow learners to develop their own multiple choice questions to assess their learning.<sup>2</sup>

The role for the educator in a system of crowd sourced and self-directed learning is to indicate what resources are available, help learners to diagnose their needs, and support a variety of study methods. The learners may then need tools like notepads, bookmarks, and timelines and concept maps to manage their own learning.

Another supporting technology that allows learners to record and monitor their learning and achievements is the Pebblepad which is a more efficient service than an e-Portfolio in that it enables the learners to create records of achievement as well as provides them with ways to reflect on performance and achievement.

## Augmentation Pedagogy

Good education has always focused beyond transmission of knowledge and assessment procedures towards making students active and independent learners. Augmentation pedagogy, being applied to modern science and technology education invites learners to make claims and propositions and then substantiate those claims by presenting evidence and arguments (Sharples et al. 2015)

To apply this pedagogy effectively, learners must be oriented to listen and reflect carefully, present ideas and claims, justify the basis for those claims and finally prove the claims by verifiable evidence. These are skills that need to be developed as these do not get developed naturally in response to the existing educational processes. The teacher's role in the augmentation pedagogy includes enabling students to articulate their ideas clearly both orally and in writing, carefully questioning the learners to help refine the ideas, enabling learners to restate and frame their ideas in scientific or mathematical language, getting the learners to develop and use models to represent the explanation of their claims. Teachers seek to achieve some of these through dynamic group discussions, enabling groups to contribute ideas to help refine problems and suggest improvements in the construction of models at various stages of discussions taking place online which involve the entire class or different groups engaged in the various projects.

Teaching practice usually involves asking simple questions on scientific problems which may not have an obvious one apparent solution and then encouraging discussion on refining the problem to enable seeking of facts to support contentions proposed by the learners. Examples could be "Is time travel possible? Why do we not feel the weight of the atmosphere? The learners are then led to an examination of the related concepts and experiments that could help them define the problem and suggest evidence to support their contention.

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<sup>2</sup> Degreed: <http://degreed.com>, Forvo: <http://www.forvo.com/>, iSpot: <http://www.ispot.org.uk/>  
Lingobee: <http://itrg.brighton.ac.uk/simola.org/#lingobee>, PebblePad: <http://www.pebblepad.co.uk/>

## Dynamic Assessment

With the evolution of pedagogies that support flexible, adaptive, open, anytime anywhere learning, either through digital scholarship or by instructor-supported learning, learner assessment practices have also evolved to reflect both outcome-based measurement and measurement across the learning cycle rather than at certain fixed points in the cycle. ePortfolios, forum-based assessments, peer evaluation and 360 degree assessments are some of the assessment practices that are fairly prevalent based on enabling technologies. Dynamic assessment consists of measurement of learner progress as well as his/her potential to learn throughout his/her journey through a given course or programme.

Successive testing acts as a dynamic tool that enables the instructor or the computer to offer personalised guidance to the learner throughout his learning process, the purpose of the entire assessment exercise being to be able to find the best ways of guiding learning for this particular student. The assessors' role is to identify the barriers to learning for a given learner and then to apply the best strategies to overcome these. Dynamic assessment before, combines both measurement and learning intervention.

In addition to determining learners' potential to learn, dynamic assessment can also alert the teacher to identify the topics or practices including skills that learners are finding difficult and thus help to restructure or relook at the learning approach being used for these topics. Dynamic assessment has been found to be especially useful in the development of 21<sup>st</sup> century skills of reasoning, problem solving and creativity among others.

Dynamic assessment is premised on the definition of the zone of proximal development, which is the difference between what a learner can do on his/her own and what is possible with the help of instruction or guidance. To quote an example, student who struggles to think of ways to measure the height of a building might be guided first to consider how the timer or the tilt sensor on a mobile phone could be used in solving the problem, and then how this could be done without the need for algebra (by sighting a 45-degree angle to the top of the building, at which point the distance from the building to the student is the same as the distance from the base to the top of the building) (Sharples et al. 2014).

## Trends in Institutions

As learners and their learning preferences undergo vast changes and as the landscape in higher education changes on account of the drivers of change discussed in the opening section of this paper, it is important to take a look at the way institutions like universities are incorporating changes to respond to or measure up to the changing dynamics.

A very large number of institutions have institutionalised some form of blended learning practices in both the on-campus and distance learning programmes. Technology has provided them with the tools to expand the scale and scope of the activities in terms of newer markets and new target learners, as well as to impart higher cost and time efficiencies to existing practices. Much research support is however needed to critically evaluate the pedagogic effectiveness of all the practices described here. We would need to know much more before claims of unqualified success can be made about every single practice. What can however be stated, information and communication technologies have provided higher education with an unlimited potential to engage seamlessly with learners, assess and track their potential and

achievement, and seek opportunities of personalised learning. Affordances of open education resources, open provision of highly specialised learning packages often for free have created open access to higher education in ways that could not have been imagined even 20 years ago. Universities are faced with challenges like making long term investments in technologies that are forever changing, making choices between proprietary and open source software, training and developing faculty to meet challenges of new pedagogies, and expectations of the 21<sup>st</sup> century learners. Development of learning spaces, connected campuses and supporting technical infrastructure are challenges that are resource intensive but could be important determinants of the growth trajectory of the institutions.

Among these challenges for universities and colleges, improving digital literacy is considered one of the solvable challenges. It is already being addressed by actions at individual institutions. At The Open University in the UK, they developed the “Digital and Information Framework” to standardise and implement better digital literacy training in their curriculum. Cornell University also has made available online resources for learning key technology skills. On the other hand, the development towards rewarding teachers for innovative and effective pedagogy was identified as a wicked challenge — one that is impossible to define, let alone solve. The prevailing trend in institutions is to provide more incentives for research over exemplary teaching.

## Summary

The developments in the technologies are both promising and exciting. However, in order for the potential and the promise to be actualised, a critical analysis of the objectives of implementing a given pedagogy application, the needs and capabilities of the target segment, the preparedness of the faculty and the provider institution in terms of resource infrastructure will need to precede the decision to go ahead with the application. In addition, concerns of equity and access, and quality of teaching learning as well as costs accruing to the learner are important considerations that may guide these choices. The available options are many and new ones emerge with almost predictable regularity, some like MOOCs and big data, almost taking the world of higher education like a storm. HEIs may need to clearly evaluate their reasons and goals for technology adoption before jumping on to a given bandwagon just because a given model is the flavour of the season, or because everyone else is part of the experiment.

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