

# The impact that ICT has on how we learn – pedagogy, andragogy or heutagogy?

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*This paper provides an overview of the impact that ICTs have on learning and some of the limitations. ICTs have been responsible for the transfer of education from passive participation to active participation. The Internet offers the learner opportunities to go beyond boundaries not experienced before – in the terms of subject matter and communication.*

*As a result of ICTs, new learning concepts have evolved, based predominantly on the constructivist mode of learning and knowledge-development. The power that the web allows the self-directed learner is enormous in comparison to the traditional classroom based learner.*

*It has been found that for learners to achieve a level of expertise the learning has to be deep, conceptual and reflective with strong links between concepts and practice. This paper seeks to illustrate some of the research findings addressing these areas.*

## Background

This paper aims to provoke some questioning about the appropriateness of learning models and the learning processes of each as applicable to ICTs in the VET sector. The aim is to give no more than a basic thought provoking overview of three levels of learning in the sector and includes some of the characteristics assigned to each of these. The aim is to provoke thought about the level that is needed and expected of learners to maintain currency and credibility in industry and globally.

It could well be assumed that for learning to take place in any environment the learner requires some foundation attributes and abilities. In addition, IT skills and the ability to use the Internet for online learning would be expected to be required. ICT is used in the classroom, in the workplace, in a learning centre and a myriad of other places, flexibility being one of the greatest benefits. So one could ask if there was a dichotomy between the learning process that takes place in the classroom in a traditional teacher-led environment compared to the learning that takes place in an independent environment using ICTs (Brennan, 2003).

Online learning is seen to be increasing to meet the needs and expectations of the learners, the convergence of technologies, the nature of training, the knowledge economy and the very fact that technology is being used in a more diverse range of situations and processes throughout the learning environment. Learners like the flexibility that it offers and the diversity for accommodating a range of learning styles. Providers are responding to these needs and what is more, they are wanting to give as much control to the learner as possible over the how, when, where and why to accommodate these requirements.

This paper will look briefly at some of the characteristics associated with pedagogy, andragogy and heutagogy and raise some questions about the different levels of

learning associated with the ICT environment and the suitability of these to the VET environment.

## Learning theory

Most learning theories take the belief that learning is an active process that makes connections between the new and old knowledge of the learner, creating an understanding as they proceed. Learning theory takes many forms, including the pedagogy, andragogy and heutagogy.

The move towards a more self-directed learning style is considered more appropriate to the new century and is more closely aligned with heutagogy, defined by Hase & Kenyon (2000) as self-determined learning. This learner centred approach could be perceived as adopting but also advancing the metacognitive elements of andragogy and the adult learning principles based on the concept of self-directedness. This approach focuses on the participative and reflective aspects of learning, constructing meaning and systems with the focus on the learner instead of the teacher. In our quest to equip learners for independent and lifelong learning, the trend towards this model could only be seen to be advantageous to the learner in an environment wherein they have to be able to respond to training needs and adopt independent learning skills. Due to the changing needs of today's learning environment, the flexible learning approaches and immediacy of learning, it could be asked if the metacognitive levels of pedagogy and andragogy are outdated and inadequate to equip the learner?

Online learning is seen as a mode conducive to fostering and promoting a broader range of pedagogical issues and the constructivist learning approach. The constructivist approach is seen to be active with the learners constructing their own ideas and concepts based on their past and present knowledge aligned with their own learning style. Whilst aligning the constructivist approach with online learning, Brennan (2003) cautions that this should be questioned as online teaching and learning still relies heavily on the transmission of information with only some degree of learner control over new sources of information.

One of the major changes that has taken place as a consequence of online learning is the shift of the control of the learning from the teacher to both teacher and learner sharing the responsibility. ICTs are one example of non-traditional learning that have facilitated this shift in responsibility. This shift in responsibility could also be seen as a major stimulus in the transfer of learning from passive to active participation, developing the skills of self-directed learning.

As a result of ICTs, new learning concepts have evolved, based predominantly on the constructivist mode of learning and knowledge-development which, 'undertakes a learner-directed process of developing, extending, modifying, and re-organising existing knowledge to generate purpose-built knowledge structures (McKavanagh, Kanen, Bevan, Cunningham & Choy, 2002). These skills would be seen to be valuable for transferring to the workplace. Work undertaken by Wilmott and Barry (2002) found that VET learning is:

- strongly focussed on learning through observation and workplace practice
- heavily skills focussed
- strongly oriented to implicit knowledge
- highly time dependent
- training for performance of tasks to standards and conditions.

This study also found that there were specific learning strategies identified to be included in the VET curriculum. Some of these were:

- increased responsibility for learning
- increased choice in learning activities
- workplace problem-based learning activities
- group work
- adult learning behaviours
- reciprocal feedback between teacher and learner.

This study noted that there was a shift in VET pedagogy for:

- self-directed learning and assessment and a shift from pedagogy to heutagogy
- improved strategies for developing and transferring higher order thinking skills
- enhancing implicit knowledge and workplace expertise.

Keep these characteristics of VET learning in mind as the following three learning theories are outlined.

### **Pedagogy, andragogy or heutagogy**

**Pedagogy** in the VET context is teacher-focused learning and comprises the teacher taking responsibility for the learning content, time and place of the learning. The focus being on the teacher's perspective and experiences rather than the learner (Learnativity, 2002).

Salmon (in Brennan, 2003) proposes instead a linear model whereby learners develop a level of comfort and efficacy. Salmon reminds us that learners do not wish to be without human support. She also reminds us that pedagogy associated with ICT is the transmission model of teaching where the information is transferred from expert to novice; that learners need to be led through a structured developmental cycle, including scaffolding and the development of expertise. This will develop skills for mastery of performance by way of motivating learners by using appropriate e-activities. This will largely be dependent of the nature of the learners, the tradition of the discipline and the suitability of the learning environment. Learners are likely to work through this cycle many times as they increase their knowledge and explore knowledge.

O'Connor (2000, cited in Brennan, 2003) views the following stages of effective learner engagement as a continuum of development with implied pedagogical practices.

These include:

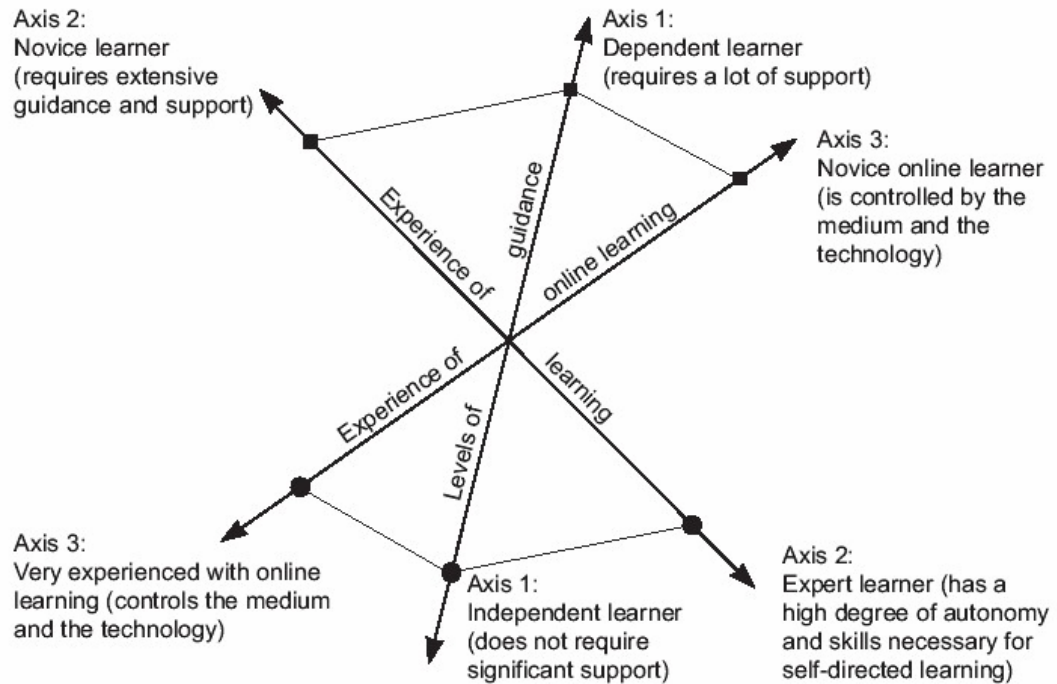
- access and motivation
- online socialisation
- information exchange
- knowledge construction
- development

It is useful to compare these characteristics with the model included below that provides some of the theoretical principles of effective pedagogy. Brennan (2003) describes the three levels as follows:

Axis 1- as **levels of guidance** and describes as showing how the needs of the learner influence content and delivery. This level takes into account factors such as learner background, learning styles, literacy level, cultural and social background.

Axis 2 – as **experience of learning** and sees this as axis as a level of self-management and guidance that students require.

Axis 3 – as **supervision of online learning** and this axis plotting the continuum of experience with learning in an online environment (Bernstein, 1996; Ailwood et al, 2000, in Brennan, 2003, p.33).



(Brennan, 2003, p.33)

This diagram provides some of the theoretical principles of effective pedagogy and reaffirms the process and stages of learning undertaken by the online learner. This indicates the developmental stages of the process and the support requirements needed as they develop self-efficacy and self-direction. It is necessary at this stage to reflect on the various metacognitive processes that would take place in each of the above scenarios as different learners travel along these continuums between independent and dependent learning and between novice and expert learner using a range of different mediums.

How likely is it that learners start their online learning experience as an independent learner with expert learning experience and are very experienced in online learning and this remaining static throughout their learning experience? Does this happen, or do learners move up and down these different axis of experience as a response to a range of factors? If this is the case, do learners fluctuate between pedagogy, andragogy and heutagogy?

**Andragogy** (Learnativity, 2002) focuses on education for all ages and includes the following five elements, which are not exhaustive:

1. informing learners of the importance of what they are learning
2. showing learners how to direct themselves through information

3. relating the topic to their experiences
4. learners have to see the relativity and they will not learn until they are motivated and ready to learn
5. assisting learners to overcome inhibitions and beliefs about learning.

**Heutagogy** is seen as a progression towards self-determined learning and a more mature form of learning. It is seen to provide a twofold opportunity for the learner whereby they can take advantage of the learning process focussing on their learning, their experiences and the process of learning from their own perspectives in preference to those perspectives of the teacher.

Secondly, this model lends itself to an online learning environment through the communication requisites and opportunities of chatrooms and online discussion. It provides learners with opportunities to explore and access a broad range of resources of their own choice with the learning process more within their control, this providing opportunities for development of self-efficacy and capacity for self-determined and lifelong learning.

Heutogogy is seen to go beyond the levels of problem-solving, extending the learning to proactivity and action learning giving the learner the opportunity to develop self-efficacy and capability, using skills such as:

- reflection
- environmental scanning
- to be able to value experience and
- interact with others.

The characteristics above complement some of the those associated with action learning (Kemmis and McTaggart, 1998 in Hase and Kenyon, 2000) involving reflection and the teacher taking a more passive role and becoming more like one of the learners, asking questions and the like. The learning environment being more shared and equal.

Another interesting dimension is that of *capability* (Stephenson & Weil, 1992 in Hase & Kenyon, 2000). Capability being a holistic attribute and capable people being characterised as being able to learn, being creative, having a high degree of self-efficacy, able to apply competencies in a range of environments and being able to work well with others. What learning processes and developmental strategies would these people be utilising and how are these people developed to become capable? Do these learners require innovative and self-determined learning opportunities to achieve these levels or do learners constantly move along a continuum from dependent to independent, that is from pedagogy to andragogy and to heutagogy?

The elements of heutagogy are similar to those required by Brennan to address all dimensions of online pedagogy. Brennan (2003) stresses that these should be available to learners so that whatever learning environment they are in, they are exposed to learning processes that allow them to:

- reduce their reliance on text
- explore and value their backgrounds
- develop their knowledge beyond transmission and assessment
- reflect on their learning, and
- become self-regulated and engaged in their learning.

Many of the characteristics found in the constructivist and heutagogical models indicate that the roles of both teachers and learners have changed with the onset of the ICT environment and that there is a link between how ICT is used and the cognitive changes in learning. For example how do these ICT characteristics affect learning:

- speed and ease of access to information
- no penalty for chasing false leads
- opportunity to access leading edge ideas
- no scrutiny of pathways or experiments ie privacy for experimentation?

It has been found that most current ICT based learning is aligned with the constructivism paradigms with the interaction between teachers and students having shifted from the traditional teacher-centred, teacher oriented interactions towards informal, exploratory and more contextually relevant experiences. Learners use ICT tools as tools of personal interaction more than for productivity and information exchange. Interactivity has also been highlighted as a necessity for successful learning. Other similarities between the learning models appropriate to online learning include:

- increased opportunities for online community of learning
- free interactions during online discussions, chat sessions, video-conferencing and teleconferences.( Barajas, 2002).

Online learning can be seen to be a particularly learner-centred approach with the learner developing knowledge and contextualising this learning into a range of applications. Good learning is perceived to involve a wide range of deep conversational exchanges, which involves appropriate, authentic practice and rich discussions among teachers and peers. For learners to achieve a level of expertise the learning has to be deep and reflective with strong links between the conceptual and practical components of the experience. In order to foster this depth of learning and share their experiences learners need to actively participate in a variety of experiences and reflective discussions. This process also provides teachers with the opportunity to align their teaching methodologies and strategies to the tasks they are teaching. (McKavanagh et al, 2002).

## **The impact of ICTs on Learning**

The generic qualities of ICT relevant to the whole curriculum are seen as: ease of information and data transfer from one source to another, the facility to draft, redraft, refine and transform that information and the speed with which this can be achieved. Integrated learning systems can provide tuition with feedback, support and privacy, important where pupils' self esteem as learners is low. ICT also fosters teamwork, since information can be easily shared and developed within the team (Heinrich, 1997).

A broad range of perspectives has influenced the impact of ICTs on learning. Oliver (2000) perceives that the Internet offers the learner opportunities that go beyond boundaries not experienced before in the terms of subject matter and communication. This he sees as happening by way of:

- enhanced achievement
- enhanced retention
- quicker to learn, and
- enhanced motivation.

The power that the web allows the self-directed learner is enormous in comparison to the traditional classroom based learner, with the combination of feedback, practice and flexibility motivating and fostering self-efficacy in adult learners (DeJoy & Mills, Mager in McIntyre, 1997). Another perspective is that there is a correlation between self-efficacy and performance with web-based training (Mager and Bandura in McIntyre, 1997).

Silver (in McIntyre, 1997) agrees with this and sees technology assisting and aiding adults with learning as:

- adults learn best by doing
- adults learn best when they can actively use information
- adults learn best when they are intrinsically motivated by the material and its challenges.

Oliver (2000) furthers this argument considering that ICTs have had the following impact on the learning process, by:

- providing a greater opportunity for learning tasks to be authentic, global, constructive and negotiable
- providing greater opportunities for learning resources to be open, non-linear, flexible and negotiable
- changing the learning support role of teachers from expert to coach
- transferring effort from the individual to a collaborative effort and
- changing fragmented assessment to integrated assessment.

The ICT learning environment is seen as a tool conducive to stimulating the communicative learning process and altering the social mode of thinking and learning. ICTs in the classroom have the potential to take a central role in the learning process affecting both knowledge building and the classroom structure. This role will depend on the media being used and the teaching process which has the potential to impact on the learning process instead of the outcomes.

Effective use of ICT in learning requires the following considerations: flexibility of the curriculum, perception of ICT as an opportunity, cost-effectiveness and collaboration amongst the participants. Luca et al (2001, in Australian Flexible Learning Framework, 2003) in their quest to find designs of learning environments that assist in the development of generic skills found that there was a need to develop learning activities that promote authentic context, self-regulation and reflection.

Sternbeg (in Salmon, 2002) sums this up with “all learning processes are impacted by the context in which they operate”.

## **Discussion**

As we embrace this new millennium we also embrace the challenges of teaching and learning. To be effective we have to be aware of these requirements and trends. One of these was the implementation of flexible delivery, which includes ICTs. Since the implementation of online learning there has been debate about the all facets of the mode including the skills and abilities of the learner for success, their technological abilities and teaching and learning perspectives and requirements of the mode.

This paper has briefly outlined some of the characteristics of the learning modes associated with ICTs. It also probes and questions some of the ideas about learning associated with the ICT environment and raises issues associated with the

developmental stages of learning approaches of pedagogy, andragogy and heutagogy. Some of the questions raised about learning from this paper are outlined below.

It questions the need for the provision of:

- learning environments that allow and encourage learners to attain self-determined learning – thus for their learning to mature and to develop from pedagogy and andragogy to heutagogy
- learning opportunities that equip learners to be able to learn in a range of environments, in particular online
- learning environments that foster capable people
- learning environments that allow and encourage the learning to centre on the learner instead of the teacher
- learning environments that skill learners for lifelong learning – thus equip the learner with learning-to-learn skills
- learning skills that equip learners to adapt to the learning requirements placed on them in employment and in the community appropriate to the needs and demands of societal trends.

In order for learners to be able to attain these skill levels and meet the workplace and community requirements expected of them, what level should their learning be? Should there be a constant pedagogic, andragogic or heutagogic approach, or do they need to fluctuate from one to another throughout their learning experience depending on the nature of the learning?

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