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Digital Technology, Gender and Connectedness in Higher Education

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ABSTRACT
This paper explores through literature review and author experience the current technological changes in university education and the implications relating to gender and the effect on issues such as learning and teaching styles. The increasing connectivity of online learning environments is enabling curriculum changes that may be more favorable for females than was the case earlier. Of course, not all new technologies offer the same promise. The limitations and the opportunities emerging for males and females are identified. These reflections on teaching and learning lead to implications of gender differences for pedagogy that include the need to incorporate a collaborative approach into curriculum design, design distinct pedagogy around the theme of connectedness, make a genuine effort to enhance student learning experience in accordance with individual limitations of technology awareness, and acknowledge positions that are implied in texts and conversations about differences. The choice of technology, and emerging advances in technologies that enhance connectedness, seem the most promising for closing the gender divide in online higher education.

Key words: Digital technology, online, gender, Internet, and Learning styles.

Digital Technology and Gender Differentials
Digital technology has become ubiquitous for most industries globally in the twenty first century. In the education sector, e-learning increasingly influences university teaching curriculum and affects pedagogical processes. It is sometimes claimed that computer-oriented curricula align more readily with interests linked to masculinity, such as mechanics, mathematics and logic. However, the increasingly complex relational, or connectedness, aspects of communication technology, in particular, may attune more with common feminine characteristics. These notions are further explored is this paper whilst identifying how such gender differentials may affect the approaches taken by educators in the e-enhanced classroom. Relationships (if any) between gender and the use of technology in teaching are identified.

Can the inexorable move to digital education be fully utilized and successful for both males and females? The answer to this question relies on an understanding of basic gender differentials in the perception of digital technology. In this paper we take the general view that males possess prototypically masculine and females feminine traits, notwithstanding exceptions.

While the complexity of labeling and gender perceptions can easily preclude generalizations, we persist with the fact that there remains a differential and we discuss this in context with technology as the issues are raised throughout the paper. Weber & Custer (2005) remind that females prefer a collaborative approach incorporated into curriculum design (Chapman, 2000; McIntosh, 1985; Rosser, 1990). It is possible that technological situations that serve to enhance a collaborative approach will appeal to the feminine nature.

Connectedness in a Technological Environment
The earliest conceptions of a computerized world were of centralization and disconnection. The sentiments were predominantly masculine. The vision of machines controlled by software built on logic drove the mass perception. Since mechanics and reason, and assertive control were stereotypically seen to be the domain of males, the computer became aligned with them. Brynin, Raban & Soffer (2006, p.7) explain that, "The long-standing male predominance in the use of technologies ... is associated with extensive job segregation by gender." More recently, communication technology is tending to bring people together who otherwise may never have met. Mobile communication is keeping people in touch who may, otherwise, have drifted apart. This new environment where people through machines are talking to each other, applying communication in ever-richer and socially interconnected ways, and taking the skill of multitasking to new levels, seems generally better aligned with common (stereotypical) notions of femininity, as communicative and relational.

In education, writers such as Loi & Dillon (2006) refer to digital technology facilitating adaptive environments as creative spaces. This most intuitive approach is far removed from the first ideas of how computers might impact on education. Devices to store and transmit information promised to provide efficiencies in education. Universities invested heavily in computer technology for largely utilitarian reasons. The Internet and increasing levels of connectivity and bandwidth are, however, changing the landscape. Debates about the effectiveness of new technologies in education are now tending to outweigh those of pure efficiency. Dillon (2006) goes further to explore a pedagogy of connection which he sees as essential in e-enhanced education environments. The human ability to socialize rests on relational skills. Vandenberg (1999) asserts that human infants are
Gender, Labeling and Identity in Educational Environments

Human beings have certain perceptions and preconceptions about the things that constitute our surrounding environment and the society's expectations. These conceptions result in attitudes that define what is acceptable and normal. We hence tend to conform to these perceptions formed by the majority of the population and oversee how these views sometimes make us narrow- or closed-minded. These preconceived notions also divide us and place us into either 'marked' or 'unmarked' group, the latter comprising of the views held by the majority. For instance, the examples provided by Aveling (2001) and McCann (1995) of the Aboriginal people who even though being the true Australians are 'marked' because of their different way of living and cultural values (see also Mezirow, 1997). How for instance 'disabled' people may consider themselves as 'marked' (see Hart, 2005; Komesaroff, 2005) and the view that we are 'marked' as educators in lectures. There could be a number of attributes by which we categorize ourselves and others such as gender, race and ethnicity, discrimination, culture, social class and poverty, sexuality, life values, accent, to name a few (Aveling, 2001).

Crabtree and Sapp (2003) have highlighted challenges experienced especially by female academics when practicing 'feminist pedagogy'. The interesting point to note in the article is when similar methods to interact with the students such as, interacting informally with students, grading, getting feedback, the female academics get less authority and respect than their male colleagues employing the same methods (see Blackmore, 2002 for examples of discrimination against female academics). In experiences of one of the authors, as a female educator she has felt the need to prove her expertise and abilities to the rest of the academics especially males. In the last few years after becoming a full-time academic, she has had to address the issues of her male colleagues undermining her authority in front of her students; and male tutors disputing her instructions as they were coming from a female. When discussing these issues of colleagues and students' attitudes, other female colleagues have commented that she should not be offended by their attitudes, as it is the norm in the 'city campus'. They further added that in the last few years lecturers were generally less respected (see also Ballard and Clanchy, 1991) by the students and posting of all the material on-line was not contributing much towards getting more student respect.

Another major aspect that tends to potentially differentiate between male and female academics (and general population) is the ease and extent of online technology usage. This is a current area of debate as universities globally are adopting various forms of digital technology to enhance their students learning experiences whilst also striving for greater competitiveness and market share. Digital technology has blurred the geographical boundaries and given flexibility to all facets of population to study further in their course of choice without the challenge of traveling overseas or even quitting their jobs to pursue their dreams.

Along with the business world, universities and the higher education sector have not been spared with the introduction of terms such as "intercultural-, comparative-, multicultural-, and international-education" (Knight, 1997, p.5, see also Blackmore, 2002; Coleman, 2003). Developments and exponential uptake of technology (such as the Internet, email, video conferencing, teleconferencing) by the wider community have closed the gap between businesses, geographical borders and time zones. Similar to U.S. or European universities, Australian universities are also facing an increasing competition from other universities globally for their share of international students. In response to such pressures many universities are now offering distance (or off-campus) courses and going into partnership with off-shore campuses (see Calverley and Shephard, 2003; Coleman, 2003; Eastmond, 2003; Hicks et al, 2001; Knight, 1997, p.5; Nachmias and Shany, 2002; Weigel, 2002).

The method of delivering education has changed over the centuries, from teaching face-to-face to a few disciples (for instance as in times of Socrates – Simpson, 2001; Nunan, 2005), to classroom teaching (involving teachers and students) (Coleman, 2003). In present times we generally practice a three-way method, involving the teacher, student and a specified curriculum (Simpson, 2001). In all these methods, reliance on memory was primary function and subsequently assessed by the educator. Then came the technology, and power-point presentation was one of the main uses of technology by educators. With the coming of the online technology, the way of delivering knowledge and learning has dramatically changed. Critics argue that "academics must adapt to new technologies or perish" (Steck, 2003). As academics we also need to remember that students of
this century are more technologically savvy than ever before (see Stacey, 2005). Accordingly, it is expected that an increasing number of universities would tailor their courses to respond to individual students needs (Sheard and Lynch, 2003; see also Anderson and Ellouni, 2004; Hicks et al, 2001).

Irrespective of the extent of technology being used by a university to distribute its material and communicate with its students, “if they do not open the learning experiences of students, they are not worth much ... e-learning should enable students’ to become more proficient learners” (Weigel, 2002, p.1, 2; see also Anderson and Ellouni, 2004; Eastmond, 2003; Philippe, 2005; Selwyn et al, 2001). Accordingly, it is essential that we as educators make a genuine effort to enhance our students learning experience, keeping in mind our personal limitations (of technology awareness) and moreover the course and university’s expectations and guidelines. Online teaching experience offers a number of advantages such as being cost-effective, offering flexibility to educators and learners, instantaneous communication and access to myriad of web resources. Universities and educators however need to be cautious that their online delivery does not become a “discouragement and isolation” (Weigel, 2002, p.8) experience for students. In online teaching, the educator/teacher needs to become a facilitator (see Mezirio, 1997; Nachmias and Shany, 2002; Simpson, 2001; Stacey, 1998).

Gender Predispositions

We now return to our questions of whether learning approaches differ amongst genders and whether males are more accepting of computer technology in a pedagogical environment than female academics. Crotty (1998) provides commentary under the heading of feminism, but proceeds to discuss the dichotomous and political nature of the issue. Barriers between feminism and other sources of difference, such as minority ethnicity, sexuality and indigeneity, are deconstructed by considering the privilege of one side of a dichotomy over the other.

Altman (2005) makes a divergent observation about the labeling of Aboriginal art, specifically, Western Desert art, being a catalyst for more widespread acceptance of other regional art styles as fine art. This steps laterally into a point about learning differences based on marked and unmarked categories. It seems artists suffer similar issues of cultural marking and stereotyping as do learners. Where some art categories are more mainstream, so are some learner categories (on variables of culture and personality). Where a learner (or an artist) breaks into acceptance in a mainstream category there is a greater chance of success. This could a compelling revelation for any educator who discovers they may have been unconsciously facilitating success for certain marked categories of learners, for example, those who are good at writing about a concept, but may not comprehensively understand its application. McCann (1995) highlights the need generally for people to acknowledge positions that are implied in texts and conversations about differences. Important issues to consider are the world view of any statements made in the learning situation, the context in which learning occurs, the beneficiaries of the context, and the barriers, if any, to the acceptance of statements.

Learning styles are not attributes set in concrete, we as individuals modify them according to particular situations. Learning styles merely “offer descriptions of the different ways in which people acquire knowledge, think, and learn” (Nachmias and Shany, 2002, p.316; see also Perry, 1994). It has been repeatedly argued that our learning styles have a direct effect on our teaching style (Ballard and Clanchy, 1991; Marshall, 2005). As a first step educators need to understand their learning styles and this can be achieved by undertaking a number of questionnaires such as the Learning Style Analysis (2005) and Learning Styles Scales (2005).

Researchers such as Rozendaal et al. (2003) have claimed that an individual’s learning and information processing occurs at two levels: surface and deep. These two levels of learning however differ among males and females with “males being more superficial” learners than females (Rozendaal et al., 2003, p.276). Males are also shown to ‘give up’ after an incorrect response and are more extrinsically motivated than females (Rozendaal et al., 2003). Guiller and Dundell (2006) found that messages posted by female students are more positive and supportive than their male counterparts. This matches well with the concept of connectedness and the relational imperatives this implies.

A study conducted by Roy et al (2003) to identify the methods used by males and females students when searching for information on- and off-line found that boys employ more effective and efficient search and sorting methods. This is consistent with the stereotype of objectivism and disconnection applied to males. Also as compared to boys, girls “had a tendency to actually open and browse the entire linked documents without going through a preliminary scanning step” (Roy et al, 2003, p.249). As opposed to the norm where females are perceived to be disadvantaged when completing online courses, study conducted by Price (2006) found that women excel in online courses as opposed to their male peers and generally do not have any lesser access to Internet. This may be indicative of the female tendency to relate to the connectedness and enhanced communicative ability provided by online networks. A study conducted of students undertaking online courses for the Connecticut Distance Learning Consortium found more positive than negatives responses in relations to their overall experiences (Sullivan, 2001). Female students preferred online courses primarily due to the
flexibility being offered by this medium so that they could balance their family and full time work. In view of students from both genders, technology assisted shy and quiet students to share their views with their peers as opposed to in a face-to-face scenario. This is consistent with the benefits of socialization as a core human activity, and one most often displayed as a feminine characteristic. At the same time, lack of face-to-face interaction was cited as the main drawback by both the genders online learning in addition to self-discipline and self pacing which was only highlighted by female students. Studies conducted by Barrett and Lally (1999); and Huang (2002) have found that males posted more number of messages online, with their average message being longer in length than females (see also Guiller and Darndell, 2006). This aligns with the assertive nature of masculinity. A cross-cultural study conducted by Gunawardena et al (2001, p.113) quoting their respondents comments reported that females were less likely to respond to messages that depicted “competitive [than] democratic” posts. Males, on the other hand are less likely to respond to message if the question asked is long in length or has a “touchy feely” element to it, aspects most often associated with females posting messages. A number of studies have found that when “compared with boys, girls report less experience with computer, less confidence in computing skills, and less interest in computers” (Lynn et al, 2003, p.144). These aspects have been attributed to the different methods for which males and females use their computer, with females viewing computers as a tool than an object of “tinkering, play, programming, or systems design” (Lynn et al, 2003, p.144; see also Czubaj, 2004; and Bostock and Lizzi, 2005). The results are quite different when the technologies under discussion are mobile phones. Geser (2006) notes the clear difference between a computer and a mobile phone in terms of their applications and the markedly higher adoption rates of the latter by females. More equity in technology usage comes when computers are designed with more ‘feminine’ software’s and games, for instance, which encourage their usage amongst children and teenagers, hence the success of mobile phones. The same was reflected in Lynn et al’s (2003) findings amongst high school students. Other studies however have not found gender to be a differentiating factor when looking at uptake of virtual learning techniques (Nachmias and Shany, 2002).

For universities to be truly successful in their efforts to share knowledge globally and practice “lifelong learning” (Hicks et al, 2001; Keogh, 2001; Selwyn et al, 2001) it is essential that efforts are made to reduce “digital divide” (Keogh, 2001; Selwyn et al, 2001) resulting from inequalities of access to technology “in terms of age, socio-economic status, race, gender” (Selwyn et al, 2001, p.260) or living in remote/rural areas, having a disability or English not being the mother tongue (Keogh, 2001, p.223). For example, research has shown that women are less likely to access technology due to their greater family commitments (see Kramarae, 2003; Selwyn et al, 2001). Study conducted by Vergidis and Panagiotakopoulos (2003) on students’ dropping-out from Open University found that females dominated this trend primarily citing “unexpected situations” or “lack of sufficient time”. Other studies have shown different learning styles of makes and females also affect the extent of on-line contribution made by females (Barrett and Lally, 1999, p.52). As this paper has begun to show, the choice of technology, and emerging advances in technologies that enhance connectedness, seem the most promising for closing the gender divide.

There is evidence that females and males have different learning styles, for example, females prefer a ‘formal’ environment to complete their tasks and are generally ‘self motivated’ in their attitudes as opposed to males who prefer an ‘informal’ environmental and are ‘non conforming’ in their attitudes. There is further scope in here for exploring whether conformity is a feature of connectedness. Certainly, standardization is an important prerequisite for fluent communication, and this precedes connectedness (Garcia & Lamsfus, 2005). As educators or designers of educational material for online courses we cannot deny this difference in learning preferences between individuals, regardless of their gender. We need to accommodate these differences by facilitating discussion groups and encouraging all groups of students, whether they are introvert or extrovert to contribute. In terms of equity of access we also need to ensure that all material posted on the online database is easily accessible and downloadable for students (across national and international borders) and does not require high bandwidth or high speed connectivity.

Beyond Gender and into Web 2.0: Connectedness Re-emerges

Creed & Zutshi (2007) remind it has been repeatedly argued that our learning styles have a direct effect on our teaching style (Ballard & Clanchy, 1991). Students, generally from Asian cultures, due to cultural backgrounds, tend to be quiet in class and write everything down even though they are familiar with the response (see Ballard & Clanchy, 1991; Gilchrist, 2005; Shao et al, 2005). Critics wonder if educators who try to modify their styles to suit such learners are aiding learners in the long run since, when they enter the diverse workforce (see Verreck, 2003) employers would not be “spoon-feeding” them. Universities still need to produce graduates capable of performing at work, otherwise the reputation of the school is eroded. Ballard and Clanchy (1991) encourage educators to recognise the cultural roots of learning habits, to explicitly address styles of learning in consort with learners, to model appropriate learning behavior and thinking styles, and to offer exemplars of study habits for learners. This experience is consistent
with the imperatives associated with gender differentials. Affirmative action has proven less effective than full cultural change in workplaces (Sturm & Guinier, 2001) and there is reason to believe this remains the case in online educational environments. It remains in the hands of the teacher as facilitator to create an environment conducive to cultural change in the online classroom and encourage greater participation of female students through engagement with collaborative, communicative, connected technologies.

The emergence of social software and Web 2.0 interactivity and the concomitant need for a facilitative teacher, the one who truly knows how information fits together and can guide the learning through the sea of information, reaffirms (Ramsden, 2003), who portends just such principles for teachers. Creed & Zutshi (2007) point out that, “it continues to be insufficient to provide fun information, say via a podcast, then fail to contextualize this for the learner in accordance with learning outcomes”. Plaisted and Irvine (2006) describe Web 2.0, the new generation of social software and interactive online applications, as encouraging the learners to “selectively participate, actively or passively, in the generation and selection of content and discussion”. This is fundamentally social connectedness and relational awareness. One feminine expression of these features can be observed in stereotypical mothering roles.

Digital Technology, Gender and Connectedness: Implications and Future Directions

Our learning styles affect our teaching styles as well. When exploring the relationships between the use of technology (in this instance, online teaching) and gender, the review of the literature reveals a general perception that males are better equipped to deal with technologically-oriented teaching and learning delivery methods than females due to their background knowledge and ease of working with computer. Even though this may be true in many instances, it is also accurate to say that with adequate education and training especially starting at a young age, females can be as good as males when using technology. Furthermore, the emergence of social software applications in an evenmore interconnected communication environment may be a more natural extension of feminine teaching and learning characteristics. The implications of these finding for university educators may include:

- Incorporate a collaborative approach into curriculum design
- Design distinct pedagogy around the theme of connectedness
- Make a genuine effort to enhance student learning experience, keeping in mind individual limitations of technology awareness
- Aim to acknowledge positions that are implied in texts and conversations about differences
- The choice of technology, and emerging advances in technologies that enhance connectedness, seem the most promising for closing the gender divide

The future of higher education appears to include expanded Web 2.0 applications, enhanced connectivity, higher levels of connectedness in fixed and mobile classroom formats, stronger emphasis on relational considerations in learning, including more group work, and expectations of collaboration between students and with teachers who actively facilitate connectedness within and external to the classroom and the institution. Such developments align significantly with natural feminine traits, but also provide benefits for all students, since human learning itself relies on efficient and effective social networking.