Mental Health and Wellbeing: Converging HCI with Human Informatics in Higher Education

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Abstract

The purpose of this paper is to stimulate discussion on how to meet the demand for flexible instructional strategies that include information and communications technologies (ICT) in higher education as effective interventions for people with mental health issues. ICT strategies are widely believed to offer new options for Web-mediated courseware design. We examine the impact of mental illness on post secondary education. Despite the advances made with multi-media and online courseware development, we suggest there has been little examination of whether ICT tools meet the specific needs of people recovering from mental illness. Correctly designed electronic courseware may provide the customised learning environment that affords the much needed flexibility people are asking for. Adoption of effective human-computer interaction (HCI) provides enhanced solutions for people with a mental health disability wishing to continue with their studies. This paper presents a compelling case for a commitment from the higher education sector towards access and equity to lessen the stigma of mental illness.

Keywords: mental health, wellbeing, post secondary education, access and equity, converging HCI, instructional design, courseware design, information and communications technologies, accessible information, flexible learning design and effective instructional strategies

Introduction

The primary aim of this position paper is to generate discussion on how best to meet the demand for more flexibility in our attitudes towards the use of adaptive instructional strategies as appropriate interventions for people with mental health issues. We argue that ICT provides opportunities for students with mental health difficulties to remain engaged in their studies during times of mental illness. We provide specific examples of how this can be achieved through effective HCI, keeping in mind the importance of remaining connected to their peers and in particular the importance of maintaining their sense of belonging to an online community for those who are not able to attend regular classes due to mental illness (Harris, 2009). These same instructional access principles of course apply to people with a physical illness or for those who have other reasons for not being able to attend scheduled on-campus classes. However the focus of this paper is on students with mental illness due to the poor outcomes of this group in terms of completion rates in higher education. Under achievement is particularly concerning given the increased numbers of students with mental illness who are enrolled in higher education (Martin & Oswin, 2008). This paper identifies a range of factors that are es-

sential for supporting students with mental illness to optimize their chances of success. We combine mental health and HCI to argue for the need to design appropriate instructional ICT strategies to support students experiencing mental illness to remain engaged with their studies. The next section considers mental health and higher education in particular, access and equity, disclosure and stigma. We finish the paper with a discussion of principles for sound instructional design.

Background

The new millennium brought with it a plethora of opportunities. This phenomenon was not lost in the educational technology field. Swept up with this emerging technological enthusiasm, many learning institutions set about implementing ubiquitous online learning policies (Anderson & Elloumi, 2004). Until this point there has been scant attention given to investigating the effectiveness of computer aided instruction and mental illness, particularly within learning institutions (Martin, McKay, & Thomas, 2004). The first onset of mental illness can occur at any age however it is most prevalent amongst young people, with three quarters of first diagnoses occurring between the ages of 16 and 25 (Mcgivern, Pellerito, & Mowbray, 2003). This is the time when young people are likely to be considering, or embarking upon, post secondary education programs. A person may have a pre-existing mental health condition or they may experience stress that can trigger a first episode of mental illness. The nature of the educational studies may generate stress that can lead to mental health difficulties. These mental health conditions will vary and include functional psychosis, mood disorders, personality disorders, anxiety disorders, eating disorders and organic disorders (DSM). A recent study of higher education students experiencing mental health difficulties during their studies found that many students had more than one psychiatric diagnosis as well as membership in multiple 'equity groups' (Martin & Oswin, 2008).

The incidence of mental health problems amongst university students is steadily increasing with estimates of between 10 to 20 per cent (Collins & Mowbray, 2005). Of particular concern are reports that these students have lower completion rates than all other disability groups (Cavallaro, Foley, Saunders, & Bowman, 2005; Moisey, 2004). It is likely that students with mental health problems experience other forms of disadvantage. Students can experience a cumulative impact due to membership of more than one equity group such as: low socio-economic status, indigenous or non-English speaking background, rural and remote or other disability. They may also have more than one mental health difficulty. Membership in more than one such 'equity group' has been found to reduce the likelihood of success in post secondary education and increase the possibility of withdrawal from studies (John, 2004).

A barrier to post secondary education arises when it is often assumed that if a student is mentally unwell they should not be attending classes (Martin, 2006). This reflects the dominant view that people must be symptom-free before they can participate or be let in (Davidson et al., 2004). Students hearing this, receive a double message when they are advised to take time off to recover. Yet if they do so, they may be penalised for not attending or participating in class activities. This absence from the classroom means, they are put at risk of failure or exclusion. The result is active social exclusion particularly for those students with persistent and ongoing symptoms of mental illness (Reidpath, Chan, Gifford, & Allotey, 2005).

Understandably these lost days from class can result in disengagement and lack of continuity with their studies. It may mean they are experiencing an inability to successfully meet study or class attendance requirements. This absence is a major loss for the young person, their family, the institution losing talented students and the broader community. On a personal level, those not studying or working run the risk of social exclusion and a life of ongoing poverty, with this non-attendance difficulty compounded by a stigma associated with a diagnosis of mental illness. Productivity loss results in an increased tax burden through government welfare and pensions or

payments that are necessary to supplement the lost main income, for those diagnosed with mental illness (Shankar, Martin, & McDonald, 2009). This dilemma increases the financial burdens that are placed on the family at a time when an increased financial independence is expected from the family member suffering the mental illness.

In the first instance it appears ICT tools offer timely solutions for this predicament, particularly in higher education. Educational technologists have been particularly energetic in the distance education sector (Wood & Ebersole, 2003). Except this is not such an easy transition when considering the requirements for flexibility when considering supporting instructional policies for people returning to study following a mental illness crisis (Martin, McKay, Hawkins, & Murthy, 2007). There are no clear cut examples that provide the leadership to sustain the necessary instructional design process that would support this type of computer mediated intervention.

To make matters worse, understanding the field of educational technology has become a linguistic nightmare. This predicament is due partly to the highly visual nature of the multi-media tools; whereby the semantic distinctions of certain words can cause problems. For Web-mediated educational environments, it is important to know when to differentiate between the design (more physical specifications) of the online information system (IS) and the required activities (the instructional methods). Consequently certain planning activities that should occur during the design phase of a computerised educational IS may be affected.

In the more established design disciplines (architectural design, graphic design) the term design is well understood. In these fields the need for time to be spent on initial documentation for specifications is well understood. The same cannot be said for the educational IS field where the HCI is required to provide safe learning contexts for those people who, from time to time, may need their tuition online (Anderson & Elloumi, 2004). Moreover, in disciplines that are not inherently visual (computer software design and mechanical engineering) the use of the word design is often misunderstood. Löwgren made the distinction between engineering design and creative design characterising the different approaches to problem solving (Löwgren, 1995). In the first instance the problem is described in fine detail through carefully considered specifications; whereas the latter approach involves a more fluid and creative exploration of many alternative solutions.

The HCI community considers design as integral to cognitive science, according to Vetting Wolf, Rode, Sussman, and Kellogg (2006), preferring to take the engineering approach to design. Yet the reality of the typical HCI usage of design is often flawed due to the misunderstandings that occur with the disparate disciplinary practices (Gaver & Dunne, 1999; McKay, 2008).

Mental Health and HCI

The period of mid to late adolescence and early adulthood is a time of major change and adjustment, not only in relation to the challenges and obligations of studies but also in terms of general expectations of increased self reliance. This situation is poignantly depicted in Conger's (1979) description of adolescence, highlighting not only change but also the confusion and self doubt that can occur:

> *Adolescence can be the time of irrepressible joy and seemingly inconsolable sadness and loss; of gregariousness and loneliness; of altruism and self-centredness; of insatiable curiosity and boredom; of confidence and self-doubt. But above all, adolescence is a period of rapid change; physical, sexual and intellectual changes in the nature of the external demands placed by society on its developing members.* (p.6)

These demands have increased in recent years with young people exposed to higher rates of stress than previous generations (Hassed, Sierpina, & Kreitzer, 2008). Herein lies the opportunity for ICT tools to make a difference in people's lives.

Mental Health and ICT tools

Originally people struggled to find the best terminology with which to describe our emergent ICT related world. Some educational technologist began experimenting. Computer aided learning (often referred to as CAL) was one of the most commonly used terms to describe computerised learning environments. Although by 1986 more than 30 million people in the USA alone were using computers, nobody was really sure what CAL meant. Instead, people recognised that computers could be used to automate learning resources. Confusion continued through the 1990s where CAL was thought to mean practically anything from the single, monolithic computer program to sets of software programs designed to increase the reach of traditional delivery computerised media. These newly created ICT artefacts included, for example, a lecture series for the educational sector, or industry-based training courses. As time went on educational course developers have added more to the confusion. Table-1 represents how Gloria Gery (1987, 1995) shows that people were mixing and matching the possibilities of using technology in learning programmes in their attempts to launch interactivity between the facilitation media and a participant. The trouble is there are many different ways to describe this newly recognised type of ICT enhanced learning environment. One way to understand the complexity of a computer-based training (CBT) environment would be to say it is, *"An interactive learning experience between a learner and a computer in which the computer provides the majority of the stimulus, the learner must respond, and the computer (then) analyses the response and provides feedback to the learner")* (p. 6).

Table 1 : Interactivity of technological media and people

Medium	Action	Environment
Computer	Assisted	Instruction
	Aided	Learning
	Managed	Education
	Based	Training
	Enhanced	Teaching
	Mediated	Development
	Interactive	Study

It is interesting to note that Gery's explanation holds true even today. CBT is difficult to define because we still have not yet embraced the learning potential found in the human-dimensions of effective HCI through well placed ICT-pedagogies. These days we face even more choice through the advent of multi-media. As time progresses more ICT tools are added to the mix in a generic techno-grab bag . The trouble with this approach is that not enough people take the time to investigate whether their instructional strategies and delivery media align with the learning context. For instance, whether they are intending to implement an interactive learning experience; with no regard for the type of learning design, and much less for the instructional architecture.

It is essential to differentiate between the type of learning and the technological means that bring forward an effective online instructional architecture to support it. This necessitates the need for a closer look at the type of learning activities that are required to prepare a learner to develop the desired knowledge and skills. This is especially important when designing information systems for people prone to mental illness.

Mental Health, ICT and Higher Education

Higher education students may have a pre-existing mental health condition prior to commencing their studies that may or may not be diagnosed. A number of students develop mental health difficulties during their studies. Models of post secondary education are based on adult learning principles that require considerable autonomy and resourcefulness from students. The move from secondary school to university can be both exciting and stressful as students learn to adapt to a new learning environment, workload and relationships with both staff and students. Having access to a personal computer is now recognised and introduced as federal government policy in Australia 2008, as a necessary educational resource for all Australian students.

The adjustments required are exacerbated for those who are studying away from home and for international students often studying in a new culture and language medium. A person's ability to manage stress and respond to change is a key aspect of mental health adjustment. In these circumstances the human-dimensions of HCI come into play. In the post secondary education field, there are numerous benefits derived from ICT tools to enhance student performance in their studies:

- personal computers and laptops offer mobile computing, which is attractive to students when they need to use a computer in a private setting. This relates to the times when a student may need to be absent from the traditional classroom;
- students can work independently, when isolated from their usual learning environment; and
- when a student experiences an episode of mental ill health they may require extra time to complete their study requirements. Easy secondary storage (automated file backups), means they can save their work to retrieve when they are feeling well enough to continue their work. Inadequate sleep affects mood and coping skills as well as energy levels and academic performance. Students who experience a first episode of mental illness, or who go undiagnosed, may experience considerable difficulties with their studies, often over extended periods (Martin, 2006).

In an Australian study of the mental health of higher education students, the researchers found that university studies generate considerable stress but at the same time assist with recovery (Martin & Oswin, 2008). Negative impacts include physical, psychological and social difficulties in the areas of; concentration, completing work on time, motivation and attending classes. Other areas affected reported in this study include increased levels of stress, failing courses, poor physical health, fearfulness and problems mixing with other students. When these moments occur, ICT affords an asynchronous capacity whereby instructional sessions can occur for the convenience of the student. Rather like the flexibility of distance education programmes, where students are encouraged to learn at their own pace.

Students experienced difficulties beyond their studies, related to coping with everyday life. Attending and participating in class is problematic for many students who fear an exacerbation of their condition and that others might find out and not understand. Efforts to conceal mental health difficulties only exacerbate the situation. Motivation, attendance and the submission of assignments can all be affected during episodes of mental illness that may in some instances require periods of hospitalization. Often there are major difficulties in managing to complete assessment activities in the set timeframe with the work submitted not of a standard that students believe reflect their true abilities.

The failure to attend class is connected with low levels of motivation, difficulties with concentration and high stress levels. Students fear that they might not have the resilience required to pull

through and worry about lost time when unwell. Raising the issue and asking staff for help is a main difficulty for students. They are particularly concerned that a lack of understanding from staff and students will result in stigma and negative discrimination leading to restricted opportunities at university and in future employment.

Negative experiences with academic, administrative and staff from counseling and disability services can leave students feeling disempowered, particularly when deemed ineligible for services. Additional time is needed during the recovery period to attend regular treatment. A cumulative impact is experienced by students who are members of more than one equity group. Further difficulties are experienced when English is a second language and when alcohol and other drugs were used in excess. The cost of treatment for some students caused financial hardship with this particularly an issue for students with longstanding mental health conditions.

Towards Effective HCI in the Higher Education Sector

This paper is proposing that a paradigmatic approach is needed to achieve a customised learning environment that draws together the inter-disciplinary nature of HCI. Aspects of instructional science, cognitive psychology and educational research are combined to articulate this concept. Consider the interactive relationships that occur between the environmental factors of an online work-space that, for example, includes: general noise that surrounds the work-space, and health and safety factors that may directly induce stress through unwise choice of colour in the user interface design (Table-2). Taking a common sense approach to many of these issues will have a marked affect on student performance. For instance: when offering students access to the emerging 'virtual reality' programmes, such as 'Second Life', care needs to be taken to provide adequate debriefing session that emphasise the differences between the abstract nature of the 'virtual environment' and the real world. Researchers now know that these emerging virtual reality learning spaces are fraught with dangers (McKay, 2008). The uncertainty for the safety of this type of ICT environmental tool is due partly to the open ended (cognitive) nature of this imaginary activity. Students with pre-existing cognitive impairment would potentially find this type of learning environment extremely difficult.

Table 2: Human factors in HCI (adapted from Preece et al., 1994, p. 31)

<table>
<tr><td colspan="2">ORGANISATIONAL FACTORS
training, job design, politics, roles, work organisation</td><td>ENVIRONMENTAL FACTORS
noise, heating, lighting, ventilation</td></tr>
<tr><td>HEALTH 7 SAFETY FACTORS
stress, headaches, muscular-skeletal disorders</td><td>cognitive processes & capabilities
THE USER
motivation, enjoyment, satisfaction
personality, experience-level</td><td>COMFORT FACTORS
Seating, equipment layout</td></tr>
<tr><td colspan="3">USER INTERFACE
input devices, output displays, dialogue structures, use of colour, icons, commands,
Graphics, natural language, e-D, user support materials, multi-media</td></tr>
<tr><td colspan="3">TASK INTERFACE
easy, complex, novel, task allocation, repetitive, monitoring, skills, components</td></tr>
<tr><td colspan="3">CONSTRAINTS
costs, timescales, budgets, staff, equipment, building structure</td></tr>
<tr><td colspan="3">SYSTEM FUNCTIONALITY
hardware, software, application</td></tr>
<tr><td colspan="3">PRODUCTIVITY FACTORS
increase output, increase quality, decrease costs, decrease errors</td></tr>
</table>

As mentioned at the outset, the primary aim of this paper is to generate discussion on how best to meet the demand for more flexibility in our attitudes towards the use of adaptive instructional strategies as appropriate interventions for people with mental health issues. As such, the follow-

ing discussion is limited to the top two rows of Table 2: the user and the organisational, health and safety, environmental and comfort factors, which is not yet covered sufficiently in the current research literature.

Organisational Factors, HCI and Mental Health

It is incumbent upon organisations to provide healthy work environments. Higher education is no exception. In most cases, high level technological infrastructure is already in place. More work is needed to provide equality and access to information technology in a more transparent manner, particularly in providing supportive policies that encourage mental wellbeing. Such supportive interventions are needed because as mentioned in more detail earlier in this paper, stigma is a socially constructed mark of disapproval, shame or disgrace that causes significant disadvantage through the curtailment of opportunities. Reidpath et.al (2005) describe stigma as, *"a mark borne by a person judged as unfit for the sharing of social resources, and stigmatisation is a process for controlling community membership or ensuring active social exclusion"* (p.5). Negative impacts on health and wellbeing are experienced by those who are excluded. The effects of stigma have been seen as contributing to an overwhelming sense of fear and isolation for the individual affected with stigma regarded as the most debilitating aspect of mental illness. Jamison (2006) highlights how stigma insinuates itself into policy decisions resulting in institutional discrimination.

Environmental Factors

There are few instances of online courseware design where the relationships shown in Table 2 are maximised. For instance, in a study of adult learners in Mexico (Santos, 2004), where special circumstances relating to access to educational technology were identified, the courseware designers neglected to address many of these HCI components. In that nationwide qualitative diagnostic study which involved community based adult education centres, the researchers were hoping to provide online educational facilities for disadvantaged adults without a basic education. It was known beforehand that these adult learners may also suffer from socio-economic marginalization, and may not have had access to educational content relating to work-based training using printed, audiovisual and electronic media. Surprisingly the study was not planned with an emphasis on any of these necessary HCI inter-relationships. Consequently, the researchers found that constructive learning or practical application was not achieved. Often people experiencing mental health difficulties are also members of other equity groups, particularly low socio-economic status due to discrimination in the workforce. Addressing issues of access to technology is crucial if students are to partake in the opportunities provided by flexible learning.

These HCI relationships are magnified in the special education environment. Special education is defined here in a broad sense, as pedagogical practice especially designed as assistive technology for people with learning disabilities (Atkinson & Walmsley, 2003). While a special education literature on computerised learning programmes has emerged in the last decade, mapping this type of HCI in terms of utilizing new knowledge in new situations (especially for mental health and wellbeing) has not been achieved.

Health and Safety Factors

In the earlier days of computing, some attention was given to the risk factors associated with usage. The most commonly reported were the physical injuries known as repetitive strain injury (RSI) also called cumulative trauma (CTD). The cognitive syndromes took longer to become more obvious. The aversion to computer usage is commonly called computer phobia; it is now treated by psychologists alongside the other phobic disorders (http://www.phobia-fear-release.com/computer-phobia.html). So far, what is known about the interactive effects of tech-

nology interventions and education in the recovery from a mental illness is unclear. To understand why this relationship is important when considering ICT tools in a recovery programme.

- One of the most obvious dangers associated with computer usage is the degree in which the computing takes place in isolation from other human beings. Due to the high levels of concentration involved in the computer interaction, people often remove themselves from the main hustle and bustle of family life. Moreover, we propose that when facing mental health issues and the subsequent need to 'take time out' from the traditional classroom; it is far too simple to assume that ICT tools will offer the best solution. Instead the online environment should be implemented as a useful adjunct intervention.
- Inadequate sleep affects mood and coping skills as well as energy levels and academic performance. Students who experience a first episode of mental illness, or who go undiagnosed, experience considerable difficulties with their studies, often over extended periods.
- There is a type of 'borderless participation' that occurs when people engage in online discussion forums. It has been shown that people's worst behaviour goes unchecked as soon as they are online. This is particularly dangerous in open-ended discussion boards (Wallace, 1999). A number of the negative effects of online participation that Wallace identifies include:
    - polarization (through mishandled intergroup dynamics),
    - aggression (seen often in the 'flame-wars' that quickly develop when using eMail), and
    - mistrust (brought on by the anonymity in which people can operate on the Internet)

The User

It is reasonably well known that the teaching style in the higher education sector will necessarily influence a student's learning experience and type and level of engagement with their subject content (Anderson & Elloumi, 2004). However, with online learning, to promote mental wellbeing, instructional strategies are needed that differentiate between the approach or view of the online activities and the supporting instructional architecture. Taking a passive/absorption approach will work best in some circumstances, while at other times there is a need for more interactivity.

The Absorption View-of-Learning requires clarity about the difference between learning and instruction. Learning in this view, is about assimilating information; while instruction is about providing information to learners. Some call this a transmission-view of teaching. Courses that rely on lectures or videotapes to transmit information generally reflect this view.

The Behavioural View of Learning was promoted in the first part of the 20th Century. Behavioural psychology promoted a different view: one that considered learning to be based on the acquisition of mental associations. This view-of-learning it is about correct responses to questions and instruction; providing small chunks of information followed by questions and corrective feedback. In the process of making many small correct responses, learners generally build large chains of new knowledge. To promote mental wellbeing this type of behavioural-view can be reflected in programmed instruction.

The Cognitive View of Learning has developed in the last part of the 20th Century, when learning was again re-conceptualised (McKay, 2008). This time the emphasis concentrates on the active processes learners use to construct new knowledge. This construction requires an integration of new incoming information from the environment with existing knowledge in memory. In the

cognitive-view, learning is about active construction of new knowledge by interacting with new information, while instruction is about promoting the psychological processes that mediate that construction. It is very important in this approach to encourage the student with mental health issues to build upon their individuality and enable them to wander around the learning materials at their own pace.

Learning Architectures

Different learning architectures can be implemented to support the various types of learning experiences. Although the active construction of knowledge is commonly accepted today as the mechanism for learning, that type of knowledge construction can be fostered through four diverse instructional environments . These are known as the 'four instructional architectures,' each represent a unique set of instructional specifications to support the different view/approach of the most desirable learning context. They also require different prescriptions/specifications to enhance the effectiveness of their particular HCI framework to suit an individual's human-dimensions.

Receptive architecture is characterised by an emphasis on providing information and reflecting a transmission view-of-learning. The information may be in the form of words and pictures both still and animated. A good metaphor for the receptive architecture is that the learner is a sponge and the instruction pours out knowledge to be absorbed. In some forms of receptive instruction, such as lectures or video lessons, learners have minimal control over the pacing or sequencing of the training.

Directive architecture reflects a behavioural view-of-learning. The assumption is that learning occurs by a gradual building of skills; starting from the most basic and progressing to more advanced levels. The lessons should be presented in small chunks of knowledge, providing frequent opportunities for learners to respond to related questions. Immediate corrective feedback should be used to ensure that accurate associations are made.

Guided Discovery architecture uses job-realistic problems to drive the learning process. Learners typically access various sources of data to resolve problems and have instructional support (sometimes called scaffolding) available to help them. Unlike the directive architecture, guided discovery offers learners' opportunities to try alternatives, make mistakes, experience consequences of those mistakes, reflect on their results, and revise their approach. The goal of guided discovery is to promote construction of mental models by helping learners experience the results of decisions made in the context of solving realistic cases and problems. Guided discovery designs are based on inductive models of learning; that is, learning of concepts and principles from experience with specific cases and problems.

Exploratory architecture, also known as 'open-ended learning', relies on a cognitive view-of-learning. Out of the four architectures identified by Clark (2003), exploratory architectures offer the most effective opportunities for providing high levels of 'learner control'. Instruction should be designed to provide a rich set of instructional/learning resources that include: learning content, examples, demonstrations, and knowledge/skills building exercises that are complete with the means to navigate the materials. Architectures of this type are frequently used for online courseware.

Increased Flexibility

It is noticeable in the educational technology literature, that since the millennium, in the rush to implement SCORM (sharable content object reference model) compliant programmes; many online learning developers have failed to check whether there is any learning which actually occurs (as demonstrated by increased proficiency of the participants) (McKay, Axmann, Banjanin, & Howat, 2007). In cases where checks are made, most attempts fail to use valid assessment

measures of the *changes* in proficiency (Izard, 2004). Furthermore, instead of concentrating on the virtues of online learning, there are many instances where it is best to take a blended approach. This means integrating the traditional classroom facilitation where the learning is conducted in a 'fact-to-face' mode and where the resources may include both paper-based and electronic-based instruction. It should be noted here that although ICT tools may have the potential to facilitate 'better' learning, it is a complete fallacy to assume the reverse.

In so far as designing supportive computer mediated interventions in higher education, we propose the following:

- Use ICT to enhance the learning experience and assist students experiencing mental illness to remain engaged with their studies;
- Adopt a collaborative partnership between the educator and student, with educators taking a proactive approach by using ICT to assist students to remain engaged with their studies and the university during periods of mental illness;
- that a blended approach is taken to provide ongoing 'face-to-face' facilitation (away from the traditional classroom if necessary), as well as providing paper-based instruction/learning content, and
- where there are SCORM modules that form an integral part of the lesson plan, that these modules are designed to reside in the usual repository; remaining accessible when the student is away from the classroom.

Discussion and Conclusions

We believe that a wellbeing preventative approach in the higher education sector is to target all new students. Implementing a ubiquitous approach such as this is preferred to avoid the necessity of students having to disclose a mental health condition to receive assistance. However for those who have disclosed they have a mental health issue, particularly those who have applied for study programmes though university access and equity initiatives; it is essential that targeted support is provided at the outset if required. Disclosure in these circumstances is more likely to lead to positive outcomes when university staff have a respectful attitude and provide appropriate assistance and advice, supported by university policies and services (Martin & Oswin, 2008).

Increasingly students are able to access course materials and other relevant information for their studies online. We argue that it is necessary to take a cognitive approach to teaching and learning for students experiencing mental health issues that cause cognitive impairment. This will employ the directive, guided discovery and exploratory instructional architectures, for all online course materials. The directive architecture is useful, particularly if a student is having difficulty with concentration. Ultimately it is best to discuss with the student what would be most appropriate to assist them to remain engaged with their studies during periods of mental illness. The use of ICT to support student engagement includes the availability of lectures online to provide students with greater flexibility. A key consideration however is not simply provision of information but the creation and fostering of a learning community that the student is an active participant in. Given the availability of quality online course materials, particularly in more recent years, a main challenge is how much classroom activity is required to meet both university and professional standards and requirements.

Moreover, we say that consideration is required by instructional systems' developers to engage themselves with the professional health care providers to learn how to develop appropriate instructional strategies that adopt the most appropriate teaching style that best suits the changing and often complex needs of students dealing with mental illness; with suitable (instructional) ar-

chitecture to support this. This requires both a willingness from the staff member and adequate time and resources on the part of the learning institution's management to do so.

Unfortunately institutional discrimination can occur where some staff and students may hold a view that those with particular mental health diagnoses (such as schizophrenia or personality disorder) are undesirable within a discipline or profession (Martin, 2006). This attitude is often covert and can lead to the curtailment of opportunities and make it difficult for students to resist and challenge this form of discrimination particularly given their view may be discredited due to their mental health status at the time. However, if enough people raise concerns of discriminatory practices, and polices and procedures are in place to counter these, discrimination is far less likely to occur.

It is perhaps fair to comment in closing this paper that some academic staff may not engage themselves in such matters, as they feel they are not skilled in dealing with mental health issues. However, given that in the Australian educational sector, the student is enrolled in their course and they have a professional 'duty-of-care', which surrounds the student's enrolment; this hesitation must be overcome. As such it needs to be carefully embedded within the educational processes of the learning institutions (in particular in the higher education sector) in such a way they can provide a referral for mental health assistance if required. Staff development and assurance programmes can assist staff to develop appropriate attitudes and skills. Helpful conversations by supportive and empathic staff, without specialist knowledge in mental health, are appreciated and lead to positive outcomes (Pilgrim, 2005, p. 99). As such, these useful conversations facilitate an understanding of how a student's mental health impacts upon their studies, what their rights are, available assistance, and how to best access these supports if and when required.

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