Disciplinary difference in students' use of technology, experience in using eLearning strategies and perceptions towards eLearning

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ABSTRACT

This paper focuses on interdisciplinary differences in three main issues related to eLearning: namely, use of technology, use of technology for teaching and learning, and perceptions about eLearning strategies. Data were survey results for 1438 students at The Chinese University of Hong Kong. Disciplines were classified into Soft/Hard and Pure/Applied based on the Biglan model. Results revealed that while students of different disciplines did not vary a great deal in their daily usage of technology, there were differences in their level of confidence in using technology. The use of technology for teaching and learning also differed across disciplines. For example, students in Applied disciplines, compared with students in Pure disciplines, had more experience in employing web-based communication tools to learn. However, there were no significant differences in terms of students' perceptions of the usefulness of eLearning strategies. The findings suggested that while there may be disciplinary differences in the adoption of eLearning, all students have a similar (and positive) view about the need for the use of technology for teaching and learning.

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1. Introduction

1.1. Defining the purpose and framework

The purpose of this study is to investigate disciplinary differences for students across three dimensions:

1. *Use of technology:* the daily use of technology among students across disciplines and their confidence towards using technology;
2. *Use of eLearning strategies:* the use of technology in teaching and learning (eLearning) among students across disciplines; and
3. *eLearning perceptions:* perceptions of students towards the usefulness of eLearning.

A few key terms used need some elaboration. Firstly, a broad definition of eLearning was adopted in the study. Conole, de Laat, Dillon, and Darby (2008) defined it as "the use of any kind if internet or communication service or electronic device that supports learning activities" (p. 513). In other words, the eLearning strategies in our study had a rather wide scope – learning activities as long as they involve the use of computers or the internet. This 'family' of eLearning strategies is large. Due to practical limitations, we limited the range and mainly focused on five categories of eLearning strategies: computers as classroom tools, computers as study tools, computers as learning resources, computers for teacher–student communication, and computers for student–student communication.

Secondly, concerning disciplines, we adopted the Biglan (1973) model of disciplines. Because of the limited scope of the present study, a two-dimensional four-category classification was adopted instead of the original three-dimensional Biglan model (minus the life/non-life

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dimension). Also, it must be noted that we broadly related the Biglan dimensions to our faculties based on our long-term knowledge of the structure and priorities of each of the faculties. Such an approach has the danger of downplaying important differences between pro-grammes within a faculty.

Faculties were classified into Soft/Hard disciplines and Pure/Applied disciplines. Soft disciplines focus on human-related phenomenon while Hard disciplines in general investigate world objects. Pure disciplines focus on theoretical explorations while Applied disciplines tend to look at how knowledge can be applied and make changes to the real world. Fig. 1 shows a typical mapping of disciplines into the Soft/Hard and Pure/Applied model. For example, science is considered to be a Hard and Pure discipline (hence abbreviated as HP in our study) because the nature of science is such that it focuses more on studying world and physical phenomenon rather than on human activities. Also, compared with engineering and medicine, there is more emphasis on theoretical developments rather application of the knowledge.

It is not the focus of this paper to engage in the long debate over the nature of academic disciplines. The seminal work of Becher and Trowler in this area (e.g. 2001) is well-known. This work was built on a plethora of studies over several decades, a few of which are noted here. Roskens (1983), for example, found that different disciplines viewed faculty productivity differently, especially when teachers were reviewed for advancement. Moses (1990) also reported that teachers in different disciplines varied in average research output in terms of number of publications, and number of research grants. Students in different disciplines may behave quite differently too. Whitmire (2002) noted that students in different disciplines had different information-seeking behaviour such as whether they used indexes to find journal articles; information-seeking behaviour patterns between undergraduates majoring in the Pure and the Applied disciplines differed significantly.

A recent work by Trowler, Saunders, and Bamber (2012) suggested that other globally oriented forces shape modern universities, including a greater focus on interdisciplinary studies. However, in a traditional, campus-focused, research-intensive university in Asia (such as The Chinese University of Hong Kong, CUHK), the power and importance of disciplinary studies is still paramount. Overall, in our context, the Biglan model seems to be an effective framework for understanding various aspects of disciplinary culture.

Smith, Heindel, and Torres-Ayala (2008) were among the few scholars who used the Biglan model to study disciplinary differences in eLearning usage. They studied fully online courses of various disciplines over a period of five years and concluded that community practice was more common in online courses of Applied disciplines such as nursing and engineering than other disciplines. In contrast, Hard/Pure subjects in science tended to incorporate more online assessments in comparison with other subjects. The study of disciplinary differences using the Biglan model in the curriculum context of blended learning, however, has not been undertaken.

1.2. Disciplinary differences in eLearning

We were interested in whether students of different disciplines vary in their habits and perceptions related to the use of technology, and to the use of technology for teaching and learning. Some reasons are discussed below.

1.2.1. Use of technology

Firstly, in the domain of the use of technology in everyday life, there is often the view that all students nowadays are 'digital natives'. Prensky (2001a, 2001b, 2006) highlighted a dramatic shift in technologies available nowadays to young and not-so-young people. Studies in Australia (Kennedy Judd, Churchward, Gray, & Krause, 2008), in the US (Kvavik, 2005), in the UK (Green & Hannon, 2007), and in Hong Kong (McNaught, Lam, & Ho, 2009) have confirmed that the vast majority of university students in these countries have immediate access to web-enabled personal computers and own personal digital devices. In particular, mobile phones, an example of a personal digital device, possess a wide range of digital and web features which enable student to use emails, msn, blogging and Facebook in everyday lives.

The homogeneity of the 'digital natives', however, is not accepted without question. Kennedy, Judd, Churchward, Gray, and Krause (2008), for example, remarked that there is limited empirical evidence which supports a universal description of students as digital na-tives. Students are not homogenous in terms of their understanding of digital technology and it might be dangerous to over-generalize the capability of students. Kvavik (2005) conducted a survey of 4374 students across 13 institutions in the United States to look at types of activities that students would engage in when they were using computers. The most common type of activities were word processing (99.5%), emailing (99.5%) and surfing the net for pleasure (99.5%); however, only 21% of the respondents reported to have used computers in creating their own content and multimedia. Results indicate that students adopt technology mainly in collecting information and communicating with others. A study of five universities in the UK by Jones, Ramanau, Cross, and Healing (2010) had similar results as Kvavik (2005). Despite a considerable range of experiences with digital use that students have had, few of them possess a "high level of competence
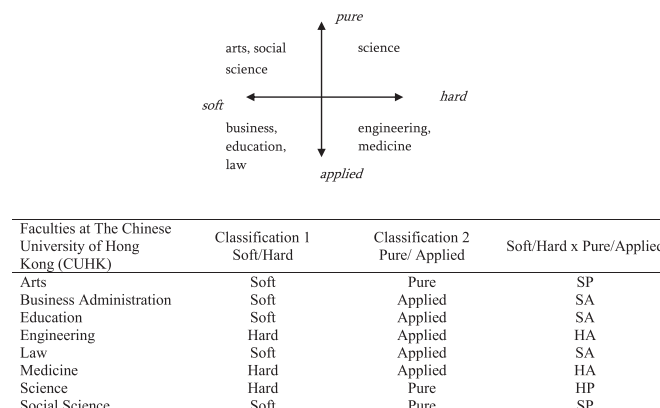
Faculties at The Chinese University of Hong Kong (CUHK)	Classification 1 Soft/Hard	Classification 2 Pure/Applied	Soft/Hard x Pure/Applied
Arts	Soft	Pure	SP
Business Administration	Soft	Applied	SA
Education	Soft	Applied	SA
Engineering	Hard	Applied	HA
Law	Soft	Applied	SA
Medicine	Hard	Applied	HA
Science	Hard	Pure	HP
Social Science	Soft	Pure	SP

Fig. 1. Mapping of disciplines at CUHK into the Biglan (1973) model.