Computer Human Interaction Education in New Zealand Universities

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The status of Computer Human Interface (CHI) education in the eight Universities in New Zealand is examined. A two-fold approach is used. We analyse the offering of CHI-related courses , survey academics, and students as to their perceptions of the topics to be studied.
Seven of the eight Universities teach 13 courses in all that explicitly contain CHI or its equivalent in the course name. Content analysis of the course descriptions is used to determine the most frequently cited topics in the discipline. The use of design tools is by far the most common topic.
30 people from the SIGCHI community responded to the survey. The most common topic that should be covered was task analysis.
50 students responded to a similar survey. The most common topic selected was Voice Telephony Interaction (VTI).
Overall both academics and students placed a high level of importance on CHI education in terms of students overall computing education and industry needs.

1. INTRODUCTION

This paper explores the current status of Computer Human Interface (CHI, also termed HCI) education within New Zealand Universities. No explicitly named CHI course is available to Information Systems or Computer Science students at the University of Auckland. The objectives of the study are to determine the need for such a course and to decide on its coverage.

Two research methods are employed. Content analysis, was conducted on all courses offered at New Zealand Universities that offer CHI. The second involved survey research. Two separate surveys were conducted on CHI academics and third year computing students. A third was prepared for the surveying of CHI practitioners, but results were not available for the writing of this paper. The attitudes of academics and computing students will be examined with the purpose of ascertaining the appropriate topics to be incorporated into such courses.

2. BACKGROUND

In this section, the current CHI course offerings by New Zealand Universities and relevant literature are examined.

2.1 Content Analysis

Michael & Lewis (1994) as cited by Yusop *et al* (2003) describe content analysis as being a technique that is used with the goal of deriving valid inferences from text. The text used in this instance are the prescriptions obtained for all the identified CHI courses. A total of 13 CHI course offerings were discovered.

Initially, the CHI terminology utilised within both surveys were used as a basis for conducting such analysis. This in turn was based on coverage in some CHI texts (e.g. Preece *et al*, 1994), plus observations on the need for CHI in different types of applications in New Zealand (e.g. ATMs, VTI). After closer examination of relevant course prescriptions, additional CHI terms were incorporated. Table 1 illustrates the coverage of identified CHI topics at New Zealand Universities.

The topic most commonly included in CHI courses was that of 'the use of design tools', included in 77% of CHI courses, with 'task analysis' being included in 46% of CHI courses.

2.2 Literature Review

A number of studies have been conducted on the status of CHI education. Such studies include a study of CHI education in Sweden (Oestreicher & Gulliksen, 2000), and Southern Africa (Kotze, 2002). The authors have been unable to locate similar publications that study CHI education from a New Zealand context.

Greenberg (1996) indicated that one of the expectations of new computing graduates is that they have the ability to develop user interfaces that have a high degree of

Table 1: Topics included in HCI Courses

CHI Topic	Courses Covering Topic
The use of Design Tools	77%
Task Analysis	46%
I/O or Interaction Design	38%
The Role of Psychology in Design	38%
Study of Usability Guidelines	38%
Practical Projects	31%
Use of Rapid Prototyping in CHI Design	23%
Issues in CHI	23%
Physiology and Ergonomics	15%
Artifical Intelligence	15%
CHI theory	15%
User Participation Design Tools	8%
Integration of UI techniques into the SDLC	8%
Graphics	8%
Expert Systems	8%
Advanced Interface Technologies	8%
Internationalisation of Software	8%
User Interface Improvement	8%
Voice Telephony Interaction	0%
ATMs, Kiosks and Other Touch Technologies	0%
Formative/Summative Usability Testing	0%

usability. However, in general, such students lack the skill and knowledge to effectively design such interfaces and thus, are unprepared for such a task. Tscheligi & Giller (1995) indicate that the inclusion of topics in CHI is considered vital within any computing related degree.

Perlman *et al* (1994) indicate that a wide variety of skills are required in order to facilitate the development of a user interface that is considered to be highly usable. The progression of skills development within the HCI field is viewed as being key to the development of the field as a whole. Such a statement is indicative of the importance of CHI education to the field as a whole.

There are a number of viewpoints as to what should be taught within an 'ideal' CHI course. For example, Oestreicher & Gulliksen (2000) conducted a study with regards to what Swedish CHI academics and practitioners perceived should be incorporated into an ideal CHI course. The CHI topics that the respondents considered had the most value to the student and industry as a whole were design principles and processes, cognitive psychology, interaction techniques, usability and task analysis

2.3 CHI Research Opportunities

In addition to offering CHI courses, some New Zealand Universities also offer CHI research opportunities to students. Such offerings include the HitLabNZ, hosted by the University of Canterbury that offers summer studentships. AUT and the University of Waikato have usability laboratories that offer CHI research opportunities to students.

3. METHODOLOGY

The purpose of this section is to discuss the methods used in this research. This section will be divided into two subsections, with each subsection representing each of the two surveys.

3.1 CHI Academic Survey

The purpose of this survey was to ascertain the importance that academics placed on a number of pre-defined CHI topics, and the importance placed on CHI education. The survey was administered using the Internet based survey tool Informis. The url was http://www.informis.co.nz/survey.asp?qnid=84. A survey link was emailed out to all members of SIGCHI-NZ, and a link was placed on their website. A total of 30 responses were received to this questionnaire. The size of the sample population is not known, but an approximation to this can be made to the number of SIGCHI attendees (response rate of 33%).

3.2 Student CHI Survey

The purpose of the student CHI questionnaire was to ascertain the level of interest students had in CHI courses and topics. The survey was administered to the students of a paper at the University of Auckland. While it is unlikely that many, if any of the students had previously undertaken a course in CHI, the students would have had familiarity with the terms utilised in the survey. Questions such as the level of interest a student had in undertaking a course in CHI, as well as interest in predefined CHI topics were posed

A total of 50 students completed the survey out of 166 enrolled over the four semester period the survey was run (30% response rate)

Table 2: Survey Results – Topic Inclusion

Topic	Percentage 'Yes'
User Participation Design Tools	87.5%
Task Analysis	73.3%
Web-based Interfaces	73.3%
Formative/summative usability testing	68.8%
Input/Output or Interaction Design	66.7%
Role of psychology in design	66.7%
Integration of UI techniques in the SDLC	62.5%
Rapid prototyping in HCI design	60.0%
Use of Design Tools	57.1%
ATMs, Kiosks & other touch interactions	40.0%
Voice Telephony Interaction	14.3%

Table 3: Survey Results – Academic Topic Importance

Topic	Importance (%)
Task analysis	76.0
Integration of UI techniques in the SDLC	68.0
Formative/summative usability testing	65.4
Input/output or interaction design	64.0
Role of psychology in design	52.0
Physiology and ergonomics	46.1
User participation design tools	40.0
Rapid Prototyping in HCI Design	34.6
Use of Design Tools	30.7
ATMs, kiosks & other touch interactions	23.0
Voice Telephony Interaction	15.3

4. RESULTS

In this section, the results obtained from the two surveys conducted will be presented.

4.1 – Survey Results: Inclusion of CHI Topics

The percentage of respondents who indicated that a specified topic had been included in the CHI course with which they were familiar is shown in Table 2. The topic 'active user participation design tools' was the most popular inclusion. The topic 'voice telephony interaction' was considered the least popular inclusion in CHI courses.

4.2 Survey Results: Importance of CHI Topics

Academic respondents rated the importance of CHI topics. The results are illustrated in Table 3.

The topic of 'task analysis' was considered the most important by academic respondents with 76% citing it as being important. The topic considered least important was 'voice telephony interaction', with 15.3% citing it as being important.

4.3 Survey Results: Student Interest in CHI Topics

Student respondents rated the level of interest they had in the predefined CHI topics. The results are shown in Table 4.

The topic with the greatest interest was 'Voice Telephony Interaction' (63.3% citing interest). The topic that had least interest was 'formative/summative usability testing' (21.4% citing interest).

4.4 Survey Results: Importance of CHI to Industry

Academic and student respondents indicated the importance they placed on CHI with regards to industry. The results are illustrated in Figure 1.

Academic respondents indicated a mean value of 6.2 and student respondents indicated a mean value of 5.7. The academic mean value equates to a ranking of between 'important' and 'very important', with the student mean value equating to a rating of between 'somewhat important' and 'important'.

4.5 Survey Results: Importance of CHI to Computing Education

Academic and Student respondents indicated the importance they placed on CHI education to a students computing education. The results obtained are shown in Figure 2.

Academic respondents indicated a mean value of 6.5, with student respondents indicating a value of 5.2, meaning academic respondents, on average, perceive CHI education to be between 'important' and 'very important'. Student respondents perceive CHI education as being between 'somewhat important' and 'important' to their overall computing education.

Table 4: Survey Results – Student Topic Interest

Topic	Interest (%)
Voice Telephony Interaction	63.3
Rapid Prototyping in HCI Design	57.1
Integration of UI techniques in the SDLC	57.1
ATMs, Kiosks & Other Touch Interactions	56.2
user participation design tools	53.1
Role of psychology in design	53.1
Input/output or Interaction design	52.0
Use of Design Tools	51.0
Physiology and Ergonomics	40.8
Task analysis	34.0
Formative/summative usability testing	21.4

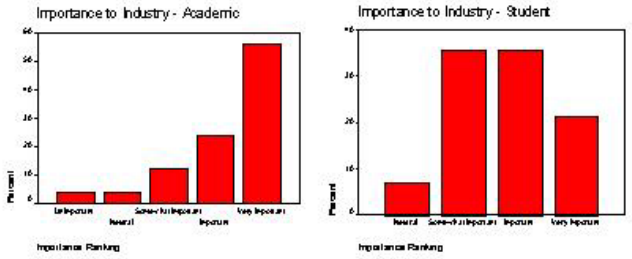

Figure 1: Importance to CHI Education

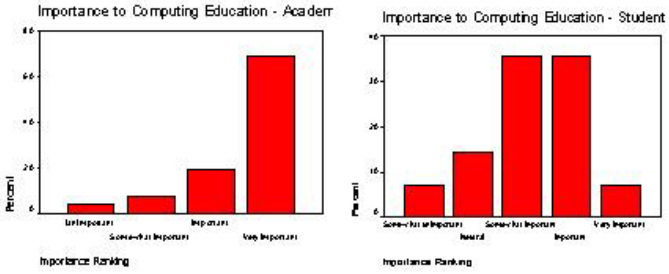

Figure 2: Importance to Industry

5. DISCUSSION

This section will discuss the results obtained from this research. Academic respondents indicated that the topics 'user participation design tools' and 'task analysis' were the most common inclusions in the HCI courses with which they were familiar with. Academic respondents then indicated they perceived the topic of 'task analysis' as being the most important topic in terms of its contribution to the field of CHI, thus indicating there was some reflection of the importance of such topics in the make up of CHI courses. However, such a statement is not always found to be true, as topics that rated highly in their inclusion in CHI courses were not deemed as being so important.

Apparent differences between the interest student respondents had in the CHI and the importance that academic respondents placed on such topics were found. For example, student respondents indicated the topic they had the greatest level of interest in was Voice Telephony Interaction (also referred to as Interactive Voice Response systems). However, academic respondents rated this topic as being the least important of all topics.

Academic respondents tended to place a greater level of importance on CHI education in terms of students overall computing education and industry. Perhaps an explanation for this result is that academic respondents have incorporated CHI as a part of their career, and as a result, will place a higher level of importance on it.

6. CONCLUSION

This research has explored the current status of CHI education from a New Zealand perspective. Survey methods were employed in order to ascertain the perceptions of academics and computing students with regards to CHI education. Some differences were apparent as to the importance and interest that both groups had with regards to CHI topics and overall. Nevertheless it was considered that not having a course dedicated to this topic in an Information Technology major was a serious omission. The prescription for such a course and the lecture outline of the topics to be included is detailed in Sharkey (2004).

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