Incorporating Students’ Input in Tailoring Technology Course Material

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Abstract

With the advancement of technology, instructors are increasingly facing the challenge of what to include in the computer technology course syllabus to keep the curriculum current. This paper reports on a classroom initiative. The aim is to share the findings of the course survey on various aspects relating to the computing course in the undergraduate curriculum, including what might be considered as suitable contents for the students. Findings revealed that a majority of students are not proficient in using the Windows Operating System, Word, Excel, and Access. Students do not want the course description to be changed. The findings should be a matter of concern. Pedagogic implications and recommendations are provided so instructors can adopt the appropriate measures to enhance learning.

Keywords: Course content, internet, software suite, ability, communication technology

1. Introduction

This paper examines one of the most fundamental compulsory courses taught during the first semester of the first year undergraduate studies in a Bachelor of Arts program offered by a private university. The course, Communication Technology I is followed by two other courses – Communication Technology II and Communication Technology III. We hope to achieve several goals. At the simplest level, it seems timely to survey what is offered in the course and what students perceive about the course content before changes in the course are put forward.

Changes to the curriculum in many departments are being carried out during the investigation period. In a young department with many new faculty members, it is difficult to persuade new members to change the course description in the absence of convincing evidence of its lack of effectiveness, or its usefulness in the overall curriculum. As a consequence, new members recruited to instruct the course shall inherit the existing course description, and hopefully make some changes in the course objectives. However, several universities are adopting web-based and distance learning approach in moving on.

Given a better understanding of what may be appropriate content for an introductory computer technology course, faculty members and educators may be able to help students acquire useful skills as well as prepare them for courses at more
advanced levels. This study was conducted to investigate students’ self-evaluation of their computing abilities and their perception on whether the course description should be changed.

2. Computers in Education

Many universities around the world provide technology courses for undergraduates in many disciplines. One might even imagine that it is natural to include an introductory computer course during the first semester of undergraduate studies. However, several criticisms abound. To begin with, some faculty members in the department commented that it is no longer necessary to teach application software such as word processing, spreadsheet or database at the undergraduate level. Others consider the course needs to be scrapped. This is a very interesting point because it implies that since students have personal computers at home, they do not need to be taught how to operate one. Second, if students do know how to operate a computer, they must indeed possess adequate fundamental knowledge on what a computer course should cover.

Having made these two points, one must acknowledge the counter view for having the introductory computer course in the curriculum. As indicated by Crowe and Zand (2000), “technology has a fundamental role to play, not only in teaching the present curriculum but also in shaping the curriculum of the future” (p. 146). Where few people know how to use the computer, the various applications software, and the Internet say five years ago, many are using them as part of their daily lives today.

Many studies have emphasized the need for producing computer literate graduates. To be computer literate, students must have skills that are useful in the business world, such as familiarity with spreadsheets, databases, and word processing (Ross, 1986). Computer literate students for example, are expected to benefit from using the computer during their undergraduate studies especially in terms of using CD-ROM databases, and effectively using the online services and the Internet for their studies. They are also expected to compile bibliographies on certain topics and do better research than students who rely on traditional method of locating useful material for their projects. Indeed, they can and are expected to use, share and acquire information through the electronic medium (Buckle, 1994).

The importance of producing computer literate graduates is recognized globally. Schools and educators are now responsible to equip students with computing skills to help them survive in the future (Gerard and Tan, 2001). Students have to learn how to use computer technology to the full advantage, and graduates must have computer skills that are useful in the business world – to gather, analyze and present information electronically, as well as adapt to the constantly-changing technology. Those who cannot use technology confidently will become increasingly marginalized within the modern world (James, 2001). As such, there is still a trend in undergraduate studies in many universities to include computer courses with laboratory sessions to equip non-technology related students with word processing, spreadsheet and database management skills.

It is vital for non-technology related students to have competent information and computer technology skills. Such skills can be the key to lifelong learning. Furthermore, many people in Macau are not as fortunate as to own a computer, or know how to operate one, hence there is a “digital divide” within the Macau society which is real and cannot be ignored. Many students bring with them
“their approach to learning”, varying degree of computer literacy and experience into the classroom. Some students might have better technology skills than their instructors (Rea, Hoger and Rooney, 1999). Most, however, are not as sophisticated as we might believe. Their English language skills and communication abilities also vary as Chinese is the primary official language while Portuguese is the secondary official language. Chinese is also the medium of instruction in almost 90% of the schools in Macau (http://dsej.gov.mo/%7ewebdsej/www/statistics-e.html). This makes it difficult for them to express themselves or write effectively, especially when all the courses are taught in English during their first year in the university.

When we look at the strength and characteristics of the Macau students, and taking into consideration other students coming from Mainland China and other parts of the world, several questions comes to our mind. That is, can we follow model curricula in leading universities around the world? Or should we change the course description, or replace the introductory technology course to make way for more “important” courses not included in the curriculum? Or should we look at the inflexible and sometimes unreasonable course structure, which should perhaps not necessarily make such introductory course a compulsory one? The latter prompts us to further examine if we are teaching the right stuff to our students, the necessity of offering the course, and what else should be included in the courseware.

Kryder (1999) pointed out that class meetings held within a quarter do not allow much time for extensive computer training. There is also the challenge – to keep the curriculum current (Gerard and Tan, 2001), and to develop educational strategies to keep up with the demands of technology and the business environment (Adams, 1988). However limited literature on syllabi or content of computer technology course exists. Therefore, in an effort to meet these challenges and given the need to understand what might be appropriate content or material to be presented in the introductory communication technology course, we explore two research questions.

Research Question 1: Are students familiar with the use of Internet and WWW, Windows Operating System, and the basic applications of a software suite?

Research Question 2: Are students satisfied with the proposed course content for the semester?

2.1 The course

The course, Communication Technology I, is a compulsory course for first year students enrolled in the English Department. It was open to students in other majors and faculties. There is no prerequisite and students’ computer knowledge and experience ranged from beginner to advance level. Students are recommended to take the course in the first semester of their undergraduate studies so that they can apply the concepts and applications software skills in other courses taken in the undergraduate curriculum.

The syllabus of the topics covered in the course complies with the course description posted on the internet and printed in the students’ booklet. The computer textbook used was widely adopted in Asia and in the United States. Students were introduced to topics including computer hardware, software, Internet and World Wide Web, computers and society, databases and information management, information system development, etc. The course combines concepts of computers and fundamentals of computers with laboratory
sessions on applications software. This provides students with knowledge and skills necessary to succeed both during their undergraduate studies and professionally in their career.

Each section met in a computer lab for three hours a week. Each class meeting of 90 minutes was divided into two sections. The first section was allocated for class discussion and a PowerPoint presentation on a lecture - on the theory based on readings of relevant chapters from the textbook. The second section was devoted to the hands-on material on the personal computer and the applications software. The course work included two short assignments and a term project. The group term project, designed to encourage collaborative learning, accounted for 15% of the grades.

3. Methodology

A questionnaire-based survey method was used in data collection. The sample population consisted of all the students who were enrolled in the three sections of a required course for students majoring in English Communication. The sections were taught by the same instructor and the survey was carried out in fall 2002.

The questionnaire was distributed during the first week of the first semester, after the instructor had gone through the course syllabus with the students. The purpose of the survey were explained to the students, and asking them to participate in the survey by returning their completed anonymous survey forms before they leave the lab. Students were informed that their input were important so that necessary adjustments can be made, especially in terms of how the lab sessions will be conducted as well as the overall pace for the entire course.

In order to determine how much time should be spent in teaching the theory and the software suite, we need to evaluate the students’ understanding of computer technology, ability to use each application software and issues including how long they have been taking all their classes in English. The latter is necessary to determine how much time to spend in teaching each chapter and applications software. General questions on whether students have difficulty submitting typed assignments were included. Several questions were posed regarding the level of comfort in using personal computers, the Internet and World Wide Web, Windows Operating System, and the applications software in a software suite. The applications software includes Word, Excel, and Access.

Students were also interviewed at the end of the semester to gather further feedback relating to the course structure, assessment, and material. In the next section of this paper, we shall present the result from the course survey.

4. Results

4.1 Demographics

The sample consisted of 53 students. Ninety six percent of the respondents returned their filled questionnaire (51/53). They were affiliated with two faculties of the university, namely the Faculty of Social Science and Humanities, and the Faculty of Business Administration. Table I identifies that most respondents were from the Faculty of Social Science and Humanities (94%), were female (78%), and attended university as full-time students (100%). The overwhelming majority of students reported that they are taking the course for the first time (84%). Six percent of the students dropped out from the sections before the end of the term. It is worth noting here that one respondent was from Myanmar, another from the United States, and the rest were
Chinese students from either Macau or Mainland China.

4.2 Students’ abilities and perceptions

The research questions investigated if students are satisfied with the topics and course material for the semester and whether students are proficient with using the personal computer. Specifically, students were asked to indicate their ability to use, and their perception of their proficiency in various applications software. Information on what need to be added or changed was also solicited.

Table I
Characteristics of respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
<td></td>
</tr>
<tr>
<td>Social Science</td>
<td>48 94</td>
</tr>
<tr>
<td>Business</td>
<td>3 6</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11 22</td>
</tr>
<tr>
<td>Female</td>
<td>40 78</td>
</tr>
<tr>
<td>Student Status</td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>51 100</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>49 96</td>
</tr>
<tr>
<td>Others</td>
<td>2 4</td>
</tr>
<tr>
<td>Compulsory course</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>40 78</td>
</tr>
<tr>
<td>No</td>
<td>11 22</td>
</tr>
<tr>
<td>Repeating the course</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8 16</td>
</tr>
<tr>
<td>No</td>
<td>43 84</td>
</tr>
</tbody>
</table>

The findings indicated that students were satisfied with the proposed course material. Based on students’ self assessment, six students (12%) perceived their computing skills as good or very good. On the other hand, a huge majority (88%) indicated their skills as fair or very poor for most areas (see Table II and III).

The survey results indicated that a majority of students are taking the course because it is a compulsory course (78%). Students agreed that the course is very important to their future competitiveness in the job market. When asked how long they have been using a computer prior to taking the course, they range from not having used a computer before (two percent) to 15 years (four percent). Slightly less than half of the respondents (47%) started using computers only during the last five years of which ten percent had been using the computer for less than a year. Two percent does not have any idea where to find the on/off switch for the computer, or name the basic components of the personal computer.

Table II
Ability to use computer and applications software

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet and WWW</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>47 92</td>
</tr>
<tr>
<td>No</td>
<td>4 8</td>
</tr>
<tr>
<td>Windows O/S</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42 82</td>
</tr>
<tr>
<td>No</td>
<td>9 18</td>
</tr>
<tr>
<td>Word</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>46 90</td>
</tr>
<tr>
<td>No</td>
<td>5 10</td>
</tr>
<tr>
<td>Excel</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38 74</td>
</tr>
<tr>
<td>No</td>
<td>13 26</td>
</tr>
<tr>
<td>Access</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19 37</td>
</tr>
<tr>
<td>No</td>
<td>32 63</td>
</tr>
</tbody>
</table>

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A majority of respondents (94%) have a personal computer at home and have used a computer before taking the course. Sixty three percent of the respondents hope to major in Communication, 29% hope to major in General English, while 8% were from another faculty. Sixty percent of respondents indicated that they intend to further their education after graduation.

Word processing was the only technology used "very often" by a majority of the respondents. Although 90% of the respondents reported they have no problem submitting typed assignments, only four percent said they are very good with the word processing software. A majority felt they are not proficient in using the Windows Operating System (86%), Word (65%), Excel (88%) and Access (98%). Only two percent indicated they are “very good” in using the Internet and World Wide Web. Students also reported they have no problem understanding the material presented during the first week. Surprisingly, the vast majority of the students (98%) expressed strong agreement that the course content and description be unchanged. The other two percent suggested
the course description be changed because the student has gone through a high school curriculum very different from the majority of the students while studying in America. Four percent of the respondents suggested adding several applications software not listed on the syllabus such as Powerpoint, Flash, and DreamWeaver. This however is beyond the scope of the introductory course as the applications software mentioned are being taught in a subsequent course by another instructor.

5. Discussion

Data analysis illustrated that the respondents who perceived their skills as good or very good had been using the personal computer longer. In other words, the level of computing skills was higher among students who had been using computers for more than 5 years. This seemed to suggest that the long duration of computer use helped to improve their computing skills. The lowest level of computer skills was found among students who started using computers during the last one year.

The information gathered from the survey was useful because the instructor can determine how much time to spend in teaching each applications software and the entire course. It also helped in deciding how much of each application software to cover in addition to the theory when there is a lack of time (Rea, Hoger, and Rooney, 1999). Furthermore, the instructor was able to tailor the course based on the students’ feedback and arrange class activities so that students can build on their knowledge. For example, when introducing the hardware of the computer, students have hands-on as they sit right in-front of the computer. In particular, the instructor stopped regularly to invite questions. This is necessary since two percent of the respondents do not know where the on/off switch of the computer is located, and slightly less than half of the respondents (49 percent) indicated that it is the first time they had taken all courses in English in the last 12 months.

Communication technology is perhaps a course that consistently has to be reinvented as new communication and computer software emerge in the market. However, the arguments for change in the course description seemed unanswerable. Since 98% of the respondents indicated that they do not want to change the course description, the instructor did not make any changes to the syllabus by adding new elements to make the curriculum “more” current. In other words, similar course material taught in the previous year was covered.

The survey findings indicated that the introductory computer technology course is invaluable to the students. Students who were familiar with using the personal computer or some aspects of the applications software can benefit from the theory covered during the first half of the 90 minutes class meeting. It also suggests that students viewed the hands-on laboratory session activities as being aimed at skill-building and the theory session as knowledge-building. While it is desirable that adequate emphasis be given to develop basic application software skills among students, adequate understanding of concepts and theories is also necessary. And with better understanding of the material presented, they are likely to benefit more from the two subsequent courses offered at a more advance level. Additionally, students who are familiar with the personal computer indicated that the laboratory sessions are useful to acquire skills to help them use the software suite more confidently and efficiently. Once most students are more comfortable, more computer literate and
more knowledgeable about the technology available to them, they can use technology more frequently and confidently.

The results indicated students regard the class meetings as important to teach hands on material and to acquire knowledge from relevant chapters from a widely adopted textbook. From the students’ point of view, there must be some value in terms of the courseware. With that in mind, it is logical to understand why students attend to the lectures, class discussions and lab activities.

With regards to the laboratory session, students who were not familiar with using the computer and application software were encouraged to sit beside those who were more “computer-savvy”. This is essential because there is no lab assistant available to assist the instructor. The assessment methods that facilitate learning include quizzes, assignments and group project. Making the marking criteria for assignments and projects easily accessible to students, assessing them continuously throughout the semester with quizzes following each chapter, and providing timely feedback proved rather useful. Students enjoyed completing the group project in particular and were proud to demonstrate their skills when they make their class presentation.

Overall, the students were satisfied with the pace the course material was presented during the semester. Students also provided feedback that the text adopted for the course is very useful, and are not willing to sell it to the subsequent batch of students.

The majority of students were not knowledgeable about the fundamental concepts of the personal computer and the theory in the text. Of the eight students who repeated the course, one dropped out before the term ended, while another failed the course for the second time. In addition, only eight students pass the lab final practical exam. The findings should be a matter of concern, as it was considered that the course description be changed to make way for other applications software.

5.1 Pedagogical issues

For instructors who are team-teaching a multiple sections course, we encourage that a common syllabus, textbook, lecture outline and final examination be use. While it is impossible to teach every student with different proficiency level all the application software material in the same manner, it is possible to teach them similar software skills to achieve the course objective. Students might then have more favorable attitude towards the learning outcomes instead of comparing work load or course material among the different instructors.

With regards to syllabi or course content instructors need to keep in mind the abilities of the students taking the course. Standard practice usually involves the standards: computer hardware, computer software, application software, as well as discussions surrounding the World Wide Web, Internet and E-mail. As most texts has chapters following this pattern, using a suitable text to develop the weekly class discussions is helpful.

Assigning a group term project to be completed out of class can be beneficial to the students. The reasons to include group project include 1) students are able to find out technology tools other students are using while doing the project; 2) the project
provides them the opportunity to interact with other classmates; 3) the process of completing the project can help improve the social communication among group members, and students can learn to develop teamwork; and 4) collaborative learning occurs as group members work together to discover knowledge, think critically, and solve problems. The interdependence among members during the process of completing the project can help students appreciate each other’s contribution while deepening their friendship. By learning to work cooperatively and communicate effectively throughout the semester, they acquire skills necessary both for academic and career success.

For effective interaction between students while extending the learning process, the group size should be limited to less than five students. The group may be given liberty to choose the topic for the term project by themselves. The topic however, should be approved by the instructor who ensures that it 1) must be challenging enough to warrant group-work; and 2) can be completed within the time frame specified.

Students assume responsibility to apply and demonstrate understanding of relevant concepts taught in the laboratory session, software suite, and the material covered in class in the final project. For example, demonstrate charts and diagrams, use of colors and other features learnt. To ensure each member contributes to the project, members may be encouraged to vote non-contributing members out of the group. The instructor however, need to monitor each group closely and set deadlines to help students keep to schedule such as project proposal, progress report, oral presentation followed by the submission of the typed final report.

Most groups revealed at the end of the semester that they mostly communicate through 1) e-mails with attachments, 2) ICQ, or 3) telephone when the group members were not able to meet outside of class meeting. Indeed, they are taking the opportunity to practice and get familiar with a medium where they may use to conduct a large part of their daily professional communication upon graduation. Students also reported that they surf the Internet for secondary data to support their project. Since the Internet is a learning tool that provides easy and quick access to almost unlimited global information, when students know how to explore the Internet confidently, they can also benefit from the rich resources.

Students’ input can help an instructor to adapt course material and adjust to the students’ learning pace. If student self-assessment can provide meaningful information to the instructor in adjusting the courseware, instructors and educators should continue to do so. While the present study focused on university students in a fundamental course, the findings may be applicable to training requirements in the workplace. The significant role of incorporating the learners’ input in adapting the course material cannot be disregarded.

6. Conclusion and recommendations

6.1 Conclusion

The introductory course in computer technology is necessary to ensure that students are well prepared for more advance courses covering aspects of desktop publishing, multimedia and applied technology. The course provides the foundation for students’ success in their undergraduate and future academic pursuits, as well as in their professional endeavors. The finding indicates the potential of scrapping the course, or changing the course...
description drastically for later intakes might perhaps be detrimental to the students. In other words, we might be doing a disservice to the students by not providing them with necessary skills required for using technology effectively and competently.

This paper has presented the various aspects related to a computer technology course in an undergraduate curriculum. The brief finding on students’ self-evaluation and expectation of the course was presented. Insights into the nature of collaborative learning, a strategy used by the instructor was provided. A careful evaluation on the impact of scrapping a fundamental course is desirable. Indeed, a lot more thinking is needed to assist students with knowledge-building.

6.2 Recommendations for future research

Several limitations of this study qualify the findings and suggest directions for future research. First, the data in this paper were gathered from classes instructed by one instructor. Therefore, the generalizations to other classes and settings should be made with caution. Further, the survey was carried out when the respondents were already enrolled in the compulsory communication technology course. Hence the students may have a positive bias toward the course syllabus. It would be fruitful to examine other students’ perception towards the technology course before the registration period as well as evaluating their perception towards the course content when it is offered as an elective course.

Detailed data was not collected to assess students’ expertise with the applications software. It is possible that students familiar with particular application software may not value the laboratory sessions. For example, students familiar with the word processing software may complete the in-class assignment in a relatively short time and might choose to leave the lab early. Alternatively, they might be “busy surfing” the net for information while their classmates are still struggling with the in-class assignment. For this reason, we encourage future researchers to consider evaluating students’ proficiency in using each application software. A challenge examination might then be considered for students who do well in specific application software in order for them to be exempted from attending the related laboratory sessions.

References