

# Work in Progress - Iterative Curriculum Development for an Interdisciplinary Online-Taught IT Course

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**Abstract** – Today, students acquire basic computer skills at the early stages of their lives through several courses taken at schools before university and social online environments where they can engage with their friends. As a result, students may become more reluctant to attend similar courses in universities. A similar situation has arisen recently with a service course, which is given to all first year undergraduate students in METU. A survey conducted two years ago showed that most students already acquire skills in basic word processing and spreadsheet tools before they have started their studies in the university. Therefore, a revision of the contents was required. After working with educators, librarians and looking into several curriculums, a new course outline was formed. This paper explains the motivations, experiences and outcome of developing a brand new curriculum for a first year course, which aims to make student computer and information literate.

*Index Terms* – computer literacy, curriculum development, information literacy.

## INTRODUCTION

Since 1999, the Informatics Institute at METU has been offering a service course named as IS100 (Introduction to Information Technologies and Applications) to more than 1000 first year undergraduates studying at different departments per semester. Initially, the curriculum was developed with the purpose of making the students computer literate by introducing topics such as computer basics, word processing and spreadsheet use. However, it has been realized that the course has become insufficient to meet the needs of both students and their departments, and that there has been a need for improvement. As a consequence, a new curriculum was designed by using an iterative approach. The development of the curriculum, the content and the courseware software has taken two years. The course with the initially modified curriculum commenced at fall semester in 2008. The current curriculum aims to make students both computer and information literate. The previous curriculum included basic word-processing, spreadsheets, hardware-software concepts (mostly out-dated information) and Windows XP operating system.

In recent years, many studies have been carried out in curriculum development for computer and information literacy courses [1]. Data and information deluge as a result of the advancements in information technology, brings out the necessity of possessing basic skills to locate, evaluate and use information effectively. Although the root of information literacy was dated back in 1970s, information-literacy movement in both Europe and U.S. has gained its momentum in the recent years [2]. In Turkey, the subject has been embraced in very few courses in couple of universities but there was no service course, which targets a wider student community yet until this course.

The current curriculum in use has been developed iteratively. In iterative curriculum development, several iterations are required to meet the learning outcomes of a course and the content should be gradually refined during these iterations [3]. First, two years ago, we conducted a situational analysis and investigated the competency level of the first-year students via a survey on 872 students -who has not taken the course before. The majority of this survey participants indicated that they had basic computer skills i.e. they are able to use Internet browsers, chat applications, basic word processing applications and presentation tools. An interesting result of this survey investigation was that many students were unaware of ethics and academic integrity rules. A similar study conducted for university students also demonstrated the lack of competency in the information literacy subjects [4].

In addition, students have been given the opportunity to be exempted from the course if they pass the proficiency exam. The figures of the former course –which includes basic IT topics-, have revealed that each year the number of students exempted from the course has increased significantly.

Second, we scrutinized the curriculums or projects involving computer and information literacy topics in different universities. For example, we have made use of some projects such as [5].

Third, a number of interviews have been conducted to understand the requirements and the needs of educators and librarians.

Finally, a pilot curriculum has been formed and discussed with educators. In order to evaluate the curriculum from the students' perspective, a survey has been prepared.

As a result, we have introduced the course on a learning management system (LMS) along with presentations, step-by-step tutorials, videos, simulations and demonstrations. We have also provided a help-desk to provide each student feedback on their assignments. Students are given four large-scale assignments during the semester apart from the usual midterm and final exams.

### COURSE DESIGN

A pilot curriculum was formed as detailed below. No textbook was acquired as not all the identified contents presented below were covered in a single book. As a result, tutorials were prepared for each week.

- Introduction to information and computer literacy  
The concepts are introduced and their importance is explained by examples. Orientation for using the learning management system (LMS) is given, where contents are provided online.
- Basic concepts in information technology  
Hardware, software and operating system terminology are introduced. Students involve in interactive activities to consolidate their knowledge.
- Human computer interaction (HCI)  
HCI is explained. Health and safety issues in working with visual display units are explained.
- File and directory management  
The basic concepts, file permissions, paths, file hosting applications, and shortcuts are described. Students study the file compatibility issues among different programs.
- Digital Information Resources  
Internet concepts, library use and effective search techniques are presented. 'Invisible web' topic is explained to the students in order to motivate them to use libraries more effectively.
- Information quality assessment and ethical/legal issues  
How to assess information returned by the search engines, how to assess content, how to cite resources, well-known citation formats, ethical/legal issues in information technology, copyrights, terms and conditions, contracts and intellectual property rights and examples, plagiarism and academic integrity are explained.
- Word processing  
Students learn how to prepare a document. Although most students acquire basic skills in word processing before attending the class, advance topics such as citation use, commenting, spelling and grammar are presented.
- Data analysis  
Students learn how to use spreadsheets. Data literacy concepts are explained. They are taught how to discover, manipulate, and interpret data. Guidelines about how to present the findings of a data analysis task by using charts or tables in an adequate manner are given.
- Presentation

Students learn how to prepare a presentation. Effective presentation techniques are explained.

- Computer maintenance, security and problem solving  
Security terminology such as firewalls, viruses, worms, digital signatures and computer maintenance topics such as de-fragmentation, disk clean up, scanning are explained. Moreover, hoax, phishing, and internet fraud concepts are described and exemplified.

- Multimedia  
Multimedia concepts and applications such as podcasting, RSS, media players and image editing applications are included. They also learn how to develop a basic web page.

### CURRENT STATUS AND PRELIMINARY RESULTS

We have developed a questionnaire involving the objectives of the course. For each objective we have asked students to assess the skills they acquired after they have finished their IS100 studies. The 161 students rated their skills between 1-5 scale (1 and 5 correspond to poor and excellent respectively). The median was obtained 4 for each objective and the averages varied between 3.35 (related to simple web page creation) and 4.35 (related to file and directory management). As large-scale assignments did not constitute a significant part of the overall grade, we realized that some students avoided doing them. As a consequence, they could not possess some skills. Therefore, we changed our grading policy. To measure the effectiveness of the curriculum, we plan to make some interviews with students.

Instructors attending the classes are also required to submit diaries after each week's class. These diaries include suggestions, problems, and students' reaction towards activities. The content is revised after the semester finishes based on these diaries. We have formed a Facebook group to get feedback from students to improve the content. By this way, we ensure that we will meet the outcomes of the course effectively and satisfy the needs of the students in a timely manner.

### REFERENCES

- [1] S. Kong, "A curriculum framework for implementing information technology in school education to foster information literacy," *Computers and Education*, vol. 51, no. 1, pp. 129-141, 2008.
- [2] S. Virkus, "Information Literacy in Europe," *Information Research*, vol. 8, no. 4, Jul. 2003.
- [3] T. Volery, "Critical success factors in online education," *The International Journal of Educational Management*, vol. 14, no. 5, pp. 216-223, 2000.
- [4] Polat.C., "Üniversite Öğrencilerinin Bilgi Okuryazarlığı Becerilerindeki Zorlanma Düzeyleri Üzerine Bir Araştırma," *Türk Kütüphaneciliği*, vol. 19, no. 4, pp. 408-431, 2005.
- [5] I. M. Academy. (2009). *21st century Information Fluency Project* [Online]. Available: <http://21cif.imsa.edu/>

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