International Journal of Business, Human and Social Sciences
ISSN: 2517-9411
Vol:8, No:2, 2014

Behavior of Engineering Students in Kuwait University

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***Abstract*—**This initial study is concerned with the behavior of engineering students in Kuwait University which became a concern due to the global issues of education in all levels. A survey has been conducted to identify academic and societal issues affecting the engineering student performance. The study is drawing major conclusions with regard to private tutoring and the online availability of textbooks' solution manuals.

***Keywords*—**Solution manual, engineering, textbook, ethics.

I. Introduction

THE engineering field is a critical profession that requires high ethical standards to utilize the engineering practice in a safe way. Until the year 2000, approximately 80% of engineering students in USA are not required to take ethics-related courses during their undergraduate study [1]. The Accreditation Board for Engineering and Technology (ABET) established a global standard for engineering education with "understanding ethical responsibility" as a major student outcome in the engineering curriculum [2]. Most of the introductory engineering and science courses has a grade percentage on assigned homework problem sets which is the prime mechanism for problem solving practice. Up to the early internet age (early 1990s), students were used to cheat by copying homework from each other, and this type of cheating is widely common even in a top worldwide engineering school like M.I.T. [3]. Usually, homework sets are assigned from the textbook and most basic engineering textbooks now have solution manuals publicly accessible online from a tremendous amount of illegal websites.

The aim of this paper is to draw attention to a very important case that is related to shadowy and hidden habits in the behavior of engineering students that might ethically affect the educational performance in any institute. These habits include hiring private tutors and using solution manuals for solving homework problem sets; hence, slowly eliminating the need of using the qualified textbooks and the assistance of professors.

The study has been initiated through a survey that was conducted on a sample of engineering students in Kuwait University to study their general behavior and find short-term and long-term solutions. Although the case being studied is not a new one and it has always been known as a global phenomenon, it has really boomed in the recent years in Kuwait University and it seriously demands a well-planned solution and high monitoring due to the continuous increase of students who are being affected by this problem.

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II. Survey Design

The survey contained overall 15 questions distributed through four sections, namely: tutoring, textbook and lectures, solution manuals, and motivation. 28% of the students that have taken the survey are freshmen who have passed less than 30 credits, 30% are students who have passed from 30 to 70 credits, 22% are students who passed 70 to 100 credits, and the rest are seniors who have passed more than 100 credits, see Fig. 1. It is seen that the students under examination are being chosen from different levels at almost equal numbers in order to generalize the case and find the roots of the problem by recognizing the period at which most of the problems do actually start showing.

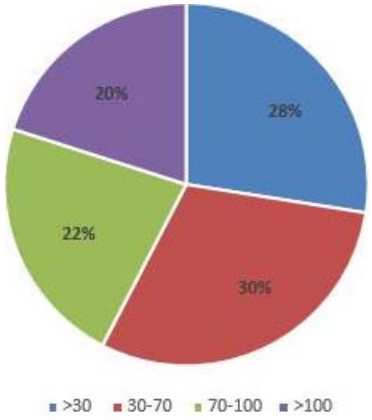

Fig. 1 Credits passed by the students under examination

III. Survey Results

A. Tutoring

This section of the survey includes two basic questions; one to measure the percentage of students who hire tutors from the beginning of the semester for helping them in most of their subjects and the other question to measure the percentage of students who hire tutors only shortly before the exam. The results of the first question, which is more critical, are shown in Fig. 2.

It is seen from Fig. 2 that about 13% of the students strongly agree on having a private tutor for the whole

semester, 44% agree, 27% agree, and 16% strongly disagree. This shows that almost 60% of the students depend on private tutors before they could even explore the subject. This of course eliminates any chance of self-study and learning, which is truly demanded in the lifestyle of any engineer through his/her profession in the future. The problem with private tuition also is that it never gives the engineering student a chance to explore the genuine weakness in him/herself if it ever appears because all the problems would be already solved and a feeling of fake confidence will mask his/her character. Once it disappears and the student finally faces the real world, the real problem actually starts. About 24% of the students who face this problem are people who have not actually wanted the major of engineering as a first choice; some of them were not accepted in the medical school while others just wanted to please their families. This means that the problem has social roots that need to be analyzed for a long-term solution. Fig. 3 shows the distribution of students who hire private tutors according to their passed credits. The first column represents freshmen, the second column represents sophomores, while the third and fourth columns represent juniors, and seniors, respectively.

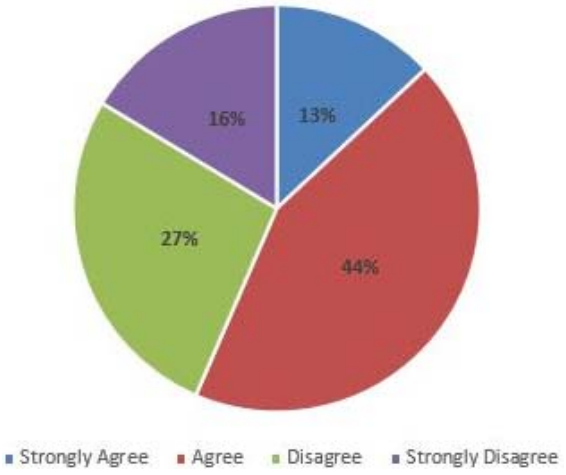

Fig. 2 Distribution of students who hire private tutors for the whole semester

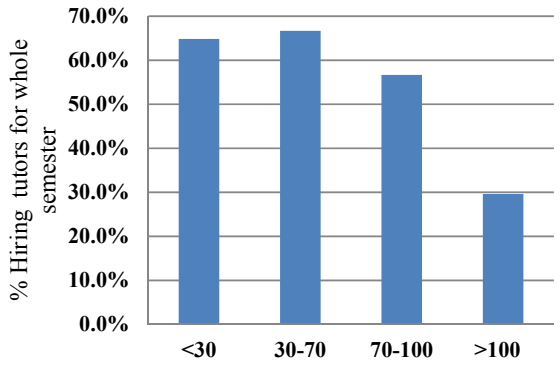

Fig. 3 Distribution of students who hire tutors for the whole semester according to their passed credits

It is noticed from Fig. 3 that most of the students who hire tutors for the whole semester are freshmen and sophomores. The reason behind that might be due to the lack of advice and guidance they receive in college on the right ways to study and score high grades. Thus, the offers of private tutors in flyers and other sources of media would really attract the attention of such students. However, the rate of students hiring tutors gradually decrease, but still 30% of the senior students have permanent tutoring.

B. Textbook Reading and Lectures

One of the other major problems that are being analyzed in this paper is the lack of use of textbooks by the engineering students in Kuwait University. Only 55% read the textbook of the subject, which is a relatively small percentage yet highly expected after the results of the problem discussed previously. 37 % of the students have problems reading textbooks because the books are written in English, and 29% of the students have problems understanding lectures delivered in English. This concludes that about 1/3 of the students have a language barrier that is affecting their performance (since 81% of the students mentioned that instructors usually deliver lectures in English with little Arabic explanations). The problem goes back to early educational issues that have to be analyzed and solved. The good thing however is that there are some students who are still ready to face such problems by finding alternative solutions with intensive work. For example, 64% of the students study each subject in regular basis and 83% of the students often take notes in the class. Fig.4 shows the distribution of students who often read textbooks according to their passed credits. It is seen from this figure that the percentage of textbook reading increases as the level of the students is increased. This concludes that the behavior of the student is dependent on how much experience the student gains throughout the period of time spent in college (see Fig. 4).

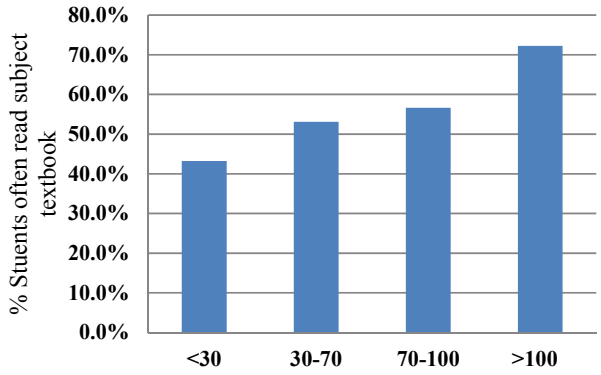

Fig. 4 Distribution of students who often read textbooks according to their passed credits

Although 37% of the sample students have problems reading textbook in English with no clear trend, the percentage is only 18% for senior students, which is significantly less than the average. Similarly, 29% of the students have

problems understanding lectures delivered in English, but the average of senior students with similar problems is only 15%.

C. Solution Manuals

Another critical subject discussed in this paper is the availability and use of solution manuals by the students. Fig.5 shows the distribution of students who copy from the solution manual.

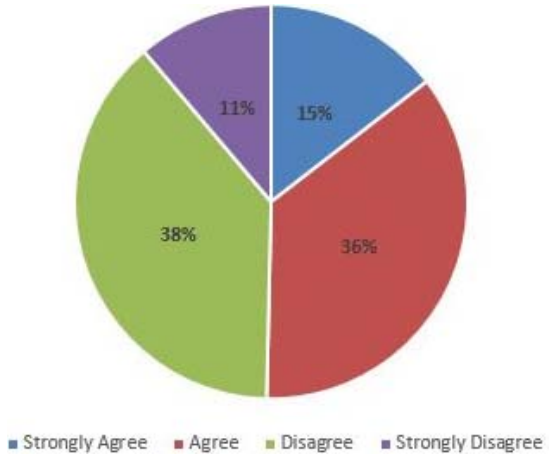

Fig. 5 Distribution of students who copy from the solution manual

In Fig.5, it is seen that 15% of the students strongly agree on copying solutions to their problems from the solution manual if they do not have enough time. 36% just agree on that, 38% disagree, and 11% strongly disagree. This means that exactly half of the students do not solve the homework they are given, which, in fact, is the most effective tool in the education of an engineer, as compared to only 10% from another study on a large engineering department in USA [4]. This is a major problem, even worse than hiring a private tutor. It is related to ethical issues and it directly affects the educational value and performance. It is an act of cheating, and the worst part is that 41% of these students claim that they have chosen the major of engineering to contribute in the building of their country. It should also be mentioned that 54% of the students claim that they copy the entire solution from the solution manual because the instructor did not cover the required material properly, and that shows another root for the problem that is related to academic issues or miscommunication between the instructor and the students.

D. Motivation

This part has been added to the survey to observe the different points of view, goals, and motivation of the sample students. As seen previously, these results were used to relate with the educational level and the general behavior that has been studied throughout the survey. Motivation is the first step towards an ethical and appropriate student behavior, and even though it is a personal issue that differs from one person to another and mainly depends on the society and environment, it could still be extremely influenced with little encouragement and guidance.

IV. Conclusion

After viewing the previous results, it could be said that all the numbers that have been discussed previously are somehow reasonable since the problem is international and common. However, they need to be modified for better results because the major of engineering is a severe profession that is directly related to people's lives and the country is in demand of highly qualified engineers that perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

Regarding ethics, the educational program should include more elements of ethical responsibility in course learning objectives. Fortunately, the college had gone one step through this solution by offering an elective course on professional and ethical responsibility. However, a more effective step is demanded to provide a better solution. The educational program shall include ethical dilemmas in each engineering course that has professional and ethical issues in its learning objectives and the instructor shall make sure to receive the responses and feedback of students in this case to provide the full benefit and understanding of the subject to the students and allow them to recognize the importance and severity of such issues [5].

Students who have problems understanding lectures delivered in English and reading textbooks need high structure, explicit teaching and extended opportunities to practice strategies until they develop independent skills. All these things require time and the students usually think that the fastest way to solve their problems is by hiring private tutors and copying from the solution manual while holding onto their excuses. In this fast-paced culture, effective time-management skills are essential. Time management is a very important skill, which can often make or break academic success. It is suggested that this subject shall be included in introductory courses or provided as an elective course also. Another option for helping students concentrate on certain subjects with enough time is to reduce curriculum requirement, which has already been approved by the university to reduce the number of required credits from 144 to 132.

As a future recommendation, it is suggested that another survey shall be conducted on teachers to find other roots of the studied problem. As teachers get more involved in the problem context, they can change their own behavior in ways that will influence positive change in their students. After determining what triggers a problem behavior, a teacher can teach the student a better way of responding. The teacher can then encourage the appropriate behavior by providing positive feedback and eliminating the need of private tutors and external sources of study. The university is also looking forward to organizing several tutorials that are optional for students who seek more help in certain courses.

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