Security Chronicles

Dr. Patricia Lasserre
Department of Computer Science
Okanagan University College (OUC)
plasserre@ouc.bc.ca

Abstract: *This poster presents the results of using chronicles as a means to develop the skills and habits for encouraging students to learn outside the frame of their study, as well as for spreading security awareness to the computer science student population of OUC. The experiment was based on the assumption that people like to work for higher purposes than themselves. We presented an assignment consisting of writing three summaries on security issues. A positive attitude towards the assignment was generated by motivating students to enrich their fellow students learning at OUC. The new department newsletter served as support: these summaries were not only presented to the entire class, but could also be selected to be printed in the newsletter, which is edited every two weeks. Surveys have been made to test both the objective of the instructor, and the objective given to the students. Results show that the students registered in the security course have been enthusiastic about the experiment. They highly valued the purpose of the exercise and worked towards providing current and relevant information, and sharing their experience and knowledge. However, the computer science community has been less passionate. We provide some reasons that could explain this lack of enthusiasm as well as improvements that could make the exercise more valuable to the students.*

Introduction

After surveying our student population, we realized that most students do not take the time to read computer magazines and develop some knowledge outside the frame of their study. The security course seems a right place to emphasize the importance of learning on a daily basis. The objective for introducing security chronicles as assignments for the new security course was to ensure students develop the skills and habits needed for becoming proactive in their learning.

Being proactive in expanding your knowledge requires commitment. Such commitment can be emphasized by creating a habit of searching continuously for new information, reading every day new articles. While we were conscious that it might be difficult to create such habits in the duration of a term, we used the security administrators as models to require our students to update their knowledge on current security threats and on the tools available on the market for security purposes, and to generate awareness on security threats in the computer science community[1] at OUC.

Experiment

Background

Okanagan University College offers the Computer Information Systems diploma, and two degrees: the Bachelor of Computer Information Systems and the Bachelor of Science with a Major in Computer Science. The CIS diploma objective is to prepare students entering the work force to junior positions especially in the programming and the system administration areas. The BCIS builds on the strength of the CIS to provide more in-depth knowledge on topics such as networking, database, and software engineering. The security course COSC 419 has been introduced this year as a special topic course. The course intent is to widen the horizons of students on security threats they could face as system administrators.

The special topic course at OUC requires students to have 4th year standing. Students taking COSC 419 this year had a diverse background. Some already had the CIS diploma and have taken

[1] For the purpose of this poster, the terms computer science community or computer science students population refer to all the students of OUC registered in a computer science diploma or degree.

many computer science courses. Others are working towards the completion of a BCIS or a BSc (not necessarily with a Major in Computer Science) and may have completed from one to three networking courses. Hence their skills and general computer science knowledge vary widely from very good technical skills and good knowledge about security issues, to only having just removed a virus on their computer.

The security course seemed the right place to emphasize our learning objectives as it is a topic where you naturally need to update your knowledge on a daily basis. Also, in September 2003, the computer science department launched a computer science newsletter that was a good medium to disseminate computer science information.

The chronicle setup

The students were requested at the beginning of the semester to present three five-minute presentations on security topics during the term. The three presentations must be on different days. As part of the assignment, they must also provide a summary of 200 to 250 words on the topic, which may be selected to be printed on the department newsletter. They have the choice to present a well-known or a new threat, to explain the concept behind a type of attack, or to present software dedicated to improving security. Each assignment required references.

There are 18 students in this course, which represents 54 different topics. The three topics per student on different dates were to ensure that students could not rely entirely on previous knowledge.

Student feedback

Two surveys have been conducted at the end of the term. One with the students registered in the security course, the other mainly targeted students in their first or second year of the CIS diploma and the BCIS degree. Both surveys had for objective to look if the newsletter was a good means for spreading security awareness. The survey of the security course students also looked if the exercise has been well-received by the students.

Security course survey: while the feedback seemed good, the instructor wanted to verify how beneficial the student felt the assignment was when marks have been assigned and anonymous feedback has been requested. The results are very encouraging:

- 93% of the students felt that the number of presentations requested was reasonable, and 86% found that the presentations were usually interesting and that they learned something new.
- Overall 86% of them would recommend the exercise for next year.
- 93% of the students liked that their work could have a purpose for the entire computer science community at OUC. The same percentage of students would accept their work to be published even after the term is over.
- 80% of the students believed that the newsletter is a good means of spreading security awareness. Interestingly, 40% were disappointed that their work has not been yet published, and 73% considered increasing the number of articles related to security in the newsletter.

Newsletter survey: although the main objective was the awareness of the students in the class, the instructor wanted to evaluate how beneficial it has been to students outside the class:

- Only 65% of the students read quite regularly the newsletter.
- While 77% of the computer science students believe that the newsletter is a good means for spreading security awareness, only 38% read regularly the column, and 27% read it sometimes.

- When asked if the articles were interesting, well-written or increased their interest, students were quite neutral. They seemed to believe the articles were interesting and well-written (50%) but only 35% out of 80% who were positive thought it had increased their interest on the topic.
- However, 55% of the students would like the security course to produce new articles next year, and 40% would like to see the newsletter expanding the security chronicles.

Faculty feedback

This class was initially scheduled as three blocks of one hour. At the beginning of the semester, the schedule was moved to two blocks of 90 minutes. This minor change had a very positive impact: as lectures are always stopped 10 minutes earlier than indicated, a three-block format means that there are only 150 minutes per week of effective presence of teaching, whereas a two-block format provides 160 minutes per week. Those 10 minutes were used for the in-class presentations of the students' assignment.

Not all assignments were presented in class. The ones presented during lecture time were selected on the basis of how close they were from the topic covered at the time. Usually, one or two presentations per lecture were presented. While the time taken in class for the presentations might have affected the total coverage of the course objectives, it is unclear to the instructor how much was due to the time taken for the presentations, and how much was due to the course being new to the instructor. We believe that with more experience on teaching that course, the time taken by the presentation could have no effect on the total coverage of the course objectives, but at the contrary, enhance it.

Clearly, the process needs improvement by providing a list of acceptable topics per week, and insuring that each week covers at least an element of the lecture as indicated by the in-class survey (requested by 60% of the students). Some interesting ideas given in the survey were to limit the number of "virus" presentation to one per student, to propose more in-depth presentation (and maybe reduce how many presentations should be produced per students). A quite original idea was to allow other members of the computer science department to participate in the list of security topics.

The publication of the assignment in the department newsletter did have a positive impact: we have been quite impressed by the commitment of the student registered in the security course to the computer science newsletter: 84% of the student agreed to have their assignments published on the newsletter. 88% of those agreeing to have their assignments published indicated that their name should appear on the newsletter.

The quality of the assignments improved as the semester was advancing, indicating a real interest from the students in the class. Class participation had also increased. There has been almost no absenteeism in this class even if the end of the term seemed to take their enthusiasm away.

The student commitment to the newsletter did not decrease at the end of the semester. The last survey still shows a real interest in the newsletter and students are favorable to having their work published beyond the course lifetime.

While the in-class survey had been quite positive, the computer science community at OUC does not seem as interested as we would have hoped. Several reasons can explain the not concerned attitude of those students:

- We should note that the survey does not represent the entire computer science student's population.
- The majority of the students surveyed were in first or second year of their studies. It seems that first year students are less inclined in reading computer science literature. Second year students were more positive about the newsletter itself and seem more proactive in expanding their knowledge.
- The newsletter is in its first year: computer science students are not yet used to have a newsletter

with new articles every two weeks. Some comments in the surveys indicated that students are reading it because the instructor brings the newsletter in the class.

Conclusion

Most students do not take the time to read computer magazines or develop some knowledge outside the classroom. This poster presents the results of using chronicles as a means to develop the skills and habits for enhancing learning habits as well as spreading security awareness for the computer science student population. The experiment was based on the assumption that people like to work for higher purposes than themselves. We presented an assignment consisting in writing three papers on security issues. For creating a positive attitude towards the assignment, we used the newly created department newsletter and we provided a purpose to the students: the objective was to create awareness of security issues to fellow students. With this objective in mind, those papers were not only presented to the entire class, but could also be selected to be printed in the newsletter, which is edited every two weeks.

Two surveys have been made to test both the objective of the instructor, and the objective given to the students. Results show that the students registered in the security course have been extremely positive. They highly valued the purpose of the exercise and generally worked towards providing relevant information, understanding security threats, and sharing their experience and knowledge. Publishing their work in the computer science newsletter did seem to increase the level of responsibility. The presentation created a nice break where student participation was emphasized, especially with 90-minute lectures. Students expressed an interest in doing more in-depth assignments like the chronicles where a topic would be uncovered and lectured to the class. Student interest did not decrease with the end of the semester: students are still favorable to having their work published beyond the course lifetime. However, the computer science community has been quite neutral in its opinion. Those results can be explained by the fact that the newsletter is still in its infancy and that most of the students surveyed were in their first and second year and were not very inclined to read. Fourth year student seem to better realize the importance of always learning.

The success of that assignment for the student registered in the security course, make us believe we should use it again next year. The major improvement for next year is to ensure that the impact of time spent in class for the presentations does not reduce the total coverage of the material. An obvious enhancement would include a list of acceptable topics per week, and insuring that the topic presented are relevant to the lecture of the day. While we believe that security awareness should be spread beyond the security course, in order for the exercise to be beneficial to other students, the computer science department will need to serve as a motor of support and generate enthusiasm for the newsletter. Only then, will this type of experiment take a larger part in student awareness and success.