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中小學資訊素養課程之研發與評鑑研究(1/3)

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THE DESIGN AND DEVELOPMENT OF AN INTERNET SAFETY CURRICULUM IN TAIWAN

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摘要：

本文敘述中小學可適用的「網路安全」課程發展，其研究目的為：(1)定義「資訊安全」(2)進行需求分析(3)設計與發展教材(4)評估教材與提出教學指引。本研究將資訊安全分為：(1)通訊安全(2)資訊之適當性與正確性(3)線上交友安全(4)環境與使用安全。課程設計原則：包括使用真實案例、製作多媒體之素材、提供完整教案與教學指引、使用另類評量方式等。

Abstract

The purpose of this paper is to report the design and development of an Internet safety curriculum for elementary and middle schools in Taiwan. The objectives are to (1) define Internet safety and identify key concepts covered in this curriculum; (2) perform needs assessment on students' prior knowledge, experiences, and

attitudes toward Internet safety; (3) design and develop curricula for the target learners; and (4) evaluate the curricula and provide guidelines for teaching and further curricula. We concluded that there are four areas of Internet safety to cover: (1) communication safety; (2) information decency and correctness; (3) online interpersonal safety; and (4) computer equipment and usage safety. Our design principles included using authentic, real-world examples in a multimedia format; a package of ready-made materials for teachers to use; a variety of learning activities; and alternative forms of evaluation. Our evaluations of this curriculum to date show that, in general, students have responded positively toward the learning experiences. More than half of the students indicated that they have begun to see how Internet safety is an important issue which can affect their lives greatly. In addition,

teachers' attitudes are known to considerably affect students' attitudes toward the issue of Internet safety.

Key Words

Internet safety curriculum, Taiwan schools

1. Introduction

As technology continues its explosive growth, the Internet has become and will continue to be a large part of our lives. And now that Internet usage and e-learning are highly promoted in schools, some may think that students' learning can be better constructed by more, and, potentially better, online information than are traditionally presented in textbooks and teachers' lectures. Unfortunately, there are also downsides to opening up an online world of quick, cheap information to students: without specific training, many students are unprepared to differentiate sound information from unsound [1]. Without solid guidelines and discipline, students may abuse the online information or be abused by providing personal information or by downloading inappropriate materials. Moreover, since the Internet provides an incredible array of interpersonal communication options, students may not be aware of the hidden dangers lurking behind online "friendships."

We educators definitely want our students' online experiences to be safe and rewarding. This places great responsibility on schools and staff alike to ensure that students receive appropriate, thorough guidance regarding the safe usage of the Internet. As Teicher [2] stated, schools already teach personal safety, fire safety, and traffic safety; it is now time to teach Internet safety and responsibility as well. However, a review of current computer or social science curricula in elementary and middle schools shows no appropriate learning materials, activities, or instructional guidelines are available. In other words, Internet safety is indispensable, but is currently neglected in our school curriculum.

2. Purpose, Objectives, and Significance

The purpose of this paper is to examine the Internet safety curriculum for elementary and middle schools in Taiwan. The objectives of the paper are to:

1. define Internet safety and identify key concepts to be covered in the curriculum;
2. analyze students' prior knowledge, experience, and attitudes toward Internet safety;
3. design and develop Internet safety curricula for Taiwan elementary and middle school students (6-18 years old); and
4. evaluate the Internet safety curriculum and provide design/implementation guidelines for further curricula.

The major contribution of this paper is that it presents, to our knowledge, the first systematically-designed curriculum addressing the Internet safety issue in Chinese. Similar programs such as CyberSmart! [2] were created and used in the United States, but no similar programs are available in the Chinese world. The Internet safety curriculum reported in this paper offers a framework within which teachers can discuss the Internet with students and also use proper materials to raise students' appreciation of how to make the network world safe, valuable, and enjoyable.

3. Internet Safety: definition and key concepts

Safety is the fundamental, paramount requirement for human beings, whether online or off. The term "Internet safety" is sometimes also known as "Internet security" (e.g., [3]) which refers to the privacy, integrity, and efficiency of the Internet information. In schools, educators are concerned with the students' costs and benefits of using the Internet. Students must be able to safely manage their online experiences, know how to deal with uncomfortable and inappropriate information, and know when to seek adult help [2]. A review of the literature on Internet safety (e.g., [4][5])

led us to include four core areas in our curriculum:

1. Communication safety. This involves teaching students how to protect themselves from viruses, hackers, spam (junk mail), and how to safeguard their confidential information.
2. Information decency and correctness. This includes how to identify rumors, pornography, misleading advertising, and other offensive content.
3. Online interpersonal safety. This covers making friends online, meeting net friends in person, and manners.
4. Lastly, a miscellaneous category involves overall safety, proper equipment, a good working environment, and posture.

Also, from the literature we found some specific online safety rules to be imbedded in the curriculum for students to follow:

1. Be aware of network characteristics: interactivity, multisensory experience, anonymity, and so on.
2. Establish ground rules for Internet access (e.g., where, when, and what Internet resources can be accessed?).
3. Never reveal personal information to strangers.
4. Never download or execute files from unknown or unidentified sources.
5. Use virus protection and/or firewall programs.
6. Be cautious with net friends, whether online or off.
7. Maintain open communication among students, parents, and teachers regarding students' online experiences—both the rewarding and the uncomfortable aspects.

4. Instructional design of the Internet safety curriculum

We based the overall design of the Internet safety curriculum on Dick and Carey's *Systematic Instructional Design* model [6], that is, analysis, design, development, and evaluation. In the two-pronged analysis stage, we first analyzed the learners: 353 Taiwan

middle school students were surveyed to assess their prior knowledge, experience, and attitudes toward Internet safety. The most striking results regarding interpersonal safety were that 97.7% of the students had heard of "net friends," about 94% of the students believed that the Internet is a good place to make friends, and 91.1% had no objection or were very willing to meet net friends in person. On the other hand, ten computer teachers and students affairs administrators interviewed expressed their deep concerns about students making net friends and meeting them in person. They thought that students are too naïve and not well-prepared to deal with online relationships.

Second, the curriculum needs were analyzed. Ten teachers and administrators we interviewed were asked to list their priorities. We found that all the teachers were concerned about Internet safety, such as virus awareness; therefore, this core area was designed first in our curriculum. In addition, specific individual needs were identified. For example, elementary school teachers were most concerned about the proper use of computer equipment; the problem of myopia is common among Taiwanese students, and many believe that long-term, relentless computer use is a major contributor to this problem. Junior and senior high school teachers were especially concerned about decency and morality (e.g., obsession with online pornography) for their male students, and the safety of interpersonal relationships for females. The above-mentioned needs analysis serves as the basis for the development of our curriculum.

In the design stage, we incorporated the following six design principles into the curriculum:

1. Use authentic, real-world examples (e.g., newspaper clips) instead of textbook-like materials.
2. Present multimedia course materials (e.g., flash animations) to attract and keep students' interest.
3. Prepare a whole package of ready-made students' activities sheets, teaching

guidelines, and reference materials for teachers' ease and convenience.

4. Encourage ongoing, thought-provoking discussions, role-play games, debates on special topics (such as "Do hackers have a code of ethics?"), etc., rather than simple rote memorization of a list of safety tips.
5. Encourage collaboration between teachers to enrich their Internet experiences and knowledge of safety issues.
6. Finally, encourage alternative evaluation, such as assessing the process and product of a group project, responses to chat room postings, and so on.

5. Development and evaluation of the Internet safety curriculum

In order to provide an easy presentation and delivery platform for teachers to use the Internet safety curriculum, the "eteacher" Web site (in Chinese) was created (<http://www.eteacher.edu.tw>) in which all course materials were placed. As shown in Table 1, multimedia materials were produced for teachers to use. There are three flash animations: "Don's New friends—Computer and Internet" (Figure 1), "Walking in the Net" (Figure 2), and "Viruses Everywhere" (Figure 3). There are also two stories, in PowerPoint format: "Nana's Net Friends" (Figure 4) and "Ya-ching's Net Friends" (Figure 5). The reason for using a slide show format instead of real-time video is the file size. (We believe a video file would be too big to put on the eteacher web site and would take too long to download.) Teachers can use these materials to provoke students' reflections and lead discussions. For example: elementary students can discuss their encounters with cold viruses vs. computer viruses. Junior high school students can discuss news stories related to sexual harassment of net friend dates. High school students can debate the merits of blocking offensive content vs. restricting the availability of desirable information.

Table 1: Multimedia learning materials for safety curriculum

Title	Safety area addressed	Target Grader	Descriptions	Related learning activities
Don's New Friends—Computer and Internet	General computer/ Internet literacy and safety	Elementary/ Junior high	Don is so excited to go to his first computer class.	1. Discuss the functions of computers and the Internet. 2. Discuss safe usage of computers and the Internet. 3. Recognize the rules and regulations of computer classrooms.
Walking in the Net	Communication safety	Elementary/ Junior high	Don is sending his personal information to a web site.	1. Discuss possible problems if we provide personal information online. 2. Discuss how to identify problematic content. 3. Discuss how to deal with indecent Internet content.
Viruses Everywhere	Communication safety	Elementary/ Junior high	Don is receiving some emails contain strange messages.	1. Define viruses and hacker. 2. Discuss how to protect us from viruses. 3. Debate on "Do hackers have a code of ethics?"
Nana's Net Friends	Interpersonal safety	Junior high/ Senior high	High school girl Nana considers whether or not to meet her net friend in person.	1. Share experiences of online friendships. 2. Discuss how to protect ourselves from trouble. 3. Change the ending of the stories.
Ya-ching's Net Friends	Interpersonal safety	Junior high/ Senior high	High school student Ya-ching cannot decide whether to lend some money to his net friend.	4. Write similar stories based on students' own experiences.

Related materials such as students' activity sheets, teacher guides, supplementary materials, etc. are also provided on the eteacher web site for each multimedia story. For example, the Appendix presents the student worksheet for "Walking in the Net." Teachers can easily download any materials, free of charge, to use in their classrooms. Related web sites are also listed for teachers to use as helpful links. Resources such as special clinics for young people and local guidance counselors are also listed.

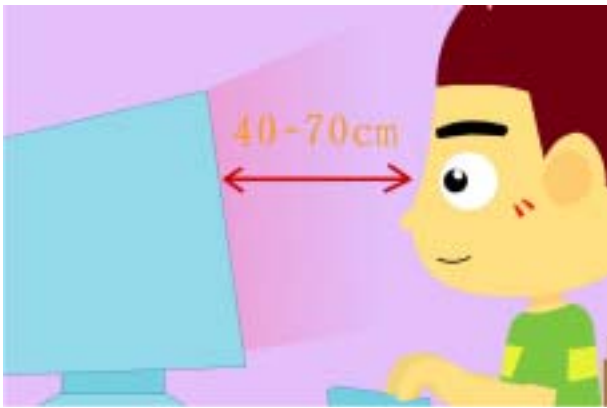


Figure 1: Sample screen from “Don’s New Friends—Computer and Internet” for curriculum on general Internet safety and literacy.



Figure 4: Sample screen from “Nana’s Net Friends” for curriculum on interpersonal safety.



Figure 2: Sample screen from “Walking in the Net” for curriculum on communication safety.



Figure 5: Sample screen from “Ya-ching’s Net Friends” for curriculum on interpersonal safety.

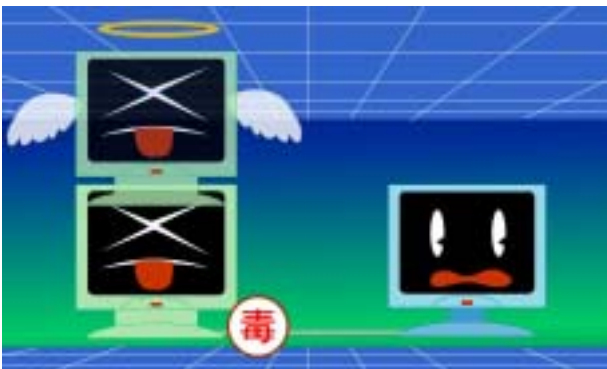


Figure 3: Sample screen from “Viruses Everywhere” for curriculum on communication safety.

Formative evaluations were conducted on the Internet safety curriculum. The methods included classroom observations (three middle school classrooms), student interviews, and surveys on students’ attitudes toward the curriculum. The observation and interview results indicated that high school students felt highly attracted to situation dramas performed by real persons, such as those in Figures 1 and 2, because some of them could relate to the stories because of their personal experiences. On the other hand, the elementary students were mostly attracted to animations such as those in Figures 3 and 4. Rapid tempos and cute characters held the key to the presentations. More than 90% of the students agreed that concrete pictures helped them understand the abstract concepts of safety. In general, students expressed positive attitudes toward the curriculum and enjoyed the

presentations and activities. For us, the most important result was that over half of the students indicated in questionnaires that they had begun to realize that Internet safety is an important issue which may affect their lives greatly.

We also interviewed teachers. All teachers expressed their appreciation for these free and easy-to-use materials. Some of them have edited the worksheets to meet their special needs, and others helped us revise the existing materials. From our classroom observations and teacher interviews, we concluded that teachers' attitudes toward the safety issue play a critical role in their teaching. If teachers think it is an important issue, then students would also take this issue seriously, and vice versa. Therefore, we are now considering more proactive ways to promote this curriculum or future ones, such as sending monthly newsletters to teachers' mailboxes, instead of passively waiting for teachers to visit our website.

5. Future Work and Conclusion

After the formative evaluation, revisions were made to the teacher web site, learning materials, and the related documents. The next step is to develop new learning materials in a variety of formats. For example, comic strips, open- or multiple-ending slide shows, and role-play games can be considered. More learning activities will be designed to accompany the learning materials, such as video-conferencing with anti-virus experts, conducting interviews with juvenile officers and court judges, role-playing a school principal who responds to offensive chat room postings, etc.

Future research should continually update the study of Internet safety. Just as the term "network" is an evolving term that may include a variety of technologies [7], so also the concept of "Internet safety" is an evolving idea. We need to keep re-defining and re-visiting the definitions, aspects, technology, and people's knowledge and attitudes toward Internet safety.

By doing so, solid learning contents and concrete evaluation criteria for different student groups can be derived from theoretical and empirical research results.

Whether we like it or not, we are living in the Internet Age. As society is increasingly dependent on the Internet, it is also increasingly concerned with the social costs, benefits, and safety of using it, especially for young people. To help ensure our students use the Internet safely and wisely, we educators need to give our charges proper guidance. The Internet safety curriculum presented in this paper is perhaps a first step toward addressing this need.

6. Acknowledgement

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Appendix : student work sheet for “Walking in the Net.”



Walking in the Net
Student Work Sheet

Class _____ Name _____

After viewing the story of “Walking in the Net,” let’s think about the following questions. Then, write your ideas in the boxes.

1. When and how can the Internet help us?

2. The Internet is very interesting and helpful, but can you think of any hidden dangers? Please write them down.

3. Is there a difference between good web sites and bad ones? What can you do if you cannot tell the difference?

4. When we use the Internet, how can we protect ourselves from getting hurt from computer

viruses or strangers?

