

考えさせる情報倫理教育ビデオとその評価

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あらまし 大学のネットワークの管理において、利用者の情報倫理教育は重大な課題の一つである。我々は大学向け情報倫理教育の教材用ビデオの製作に携わった。このビデオは授業で学生に討論させたり考えさせたりすることができるように作られている。このビデオの紹介とその有効性について述べる。

キーワード ネットワーク管理, 情報倫理, 教育, 評価

A Digital Video Material for Computer Ethics Education, which Promotes Discussion and Thinking, and Its Evaluation

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Abstract In order to manage a network of universities, computer ethics education for users is one of the most important subjects. We produced a digital video material on computer ethics for use in higher education. This video is designed to prompt thinking and discussion in a class session. We introduce this video and show its evaluation.

Keyword Network Management, Computer Ethics, Education, Evaluation

1. INTRODUCTION

Most universities and colleges provide networked computers, and users have been using e-mail, web and other network applications for many years. In these institutions, the importance of and the need for computer ethics education are highly recognized. Teaching computer ethics to the users is very important for providing them safer cyber-space life. It is also important to manage the network. It is very difficult to manage the network without computer ethics education for users. In some of these institutions, computer ethics is a compulsory subject and in other institutions, taking a short lecture course on computer ethics is required for using the campus network.

Many of the former classes on computer ethics in higher

education are traditional style classes with a blackboard, texts and notebooks. It is difficult for students to grasp the problem in the real world by this traditional lecture style. Visual materials on computer ethics, which show examples of trouble, seem to help the students understand such trouble.

The Association of National Universities' Education Center for Information Processing (AECIP) in Japan produced the "digital video clips of computer ethics" ("video clips 1") with the National Institute of Multimedia Education (NIME) in 2002. We, the authors of this paper, are the members of the video production task force of AECIP. The "video clips 1" got a good reputation. So far, 19,800 licenses are used in 125 universities/colleges. We previously reported on the "video clips 1" and its impact on computer ethics education [6][7]. In order to enrich the "video clips 1", AECIP and NIME decided to produce a new version of the digital video clips

of computer ethics (the “video clips 2”).

The purpose of these videos is to help students learn what kinds of incidents they might encounter and how to cope with them in cyber space.

In this paper, we focus on the “video clips 2”. The “video clips 2” contains twenty clips that depict the daily life of three students in a Japanese university. Each clip consists of an episode and its explanation from technical and legal points of view. Some problems have no ‘correct’ answer and are designed to prompt thinking and discussion in a class session. We ran a preview of this video for dozens of university teachers, most of whom expressed interest in buying it. After the release of “the video clips 2” in November 2005, 11,200 licenses of the video clips are already used in 150 universities/colleges until April 2006. We are now using the video in our classes and evaluating the students’ responses.

The rest of this paper is organized as follows. In section 2, the overview of the video clips is shown. In section 3, the making of the video clips is described. In section 4, the results of a survey of students who watched the video clips and an analysis of the survey results are presented. In section 5, the effect of the structure of the video clips is considered. Then in section 6, related works are shown. Finally in section 7, we summarize this paper and present some possible future works.

2. OVERVIEW OF THE VIDEO CLIPS

The “video clips 2” contains twenty clips that depict the daily life of three students in a Japanese university. The total duration of the “video clips 2” is about two hours.

Each clip consists of one episode and its explanation. Each episode is a drama concerning the three students. The three students are Masami, a female student, Yukie, another female student, and Shunsuke, a male student. Each episode is followed by an explanation from technical and legal points of view. The explanation consists of talks by two narrators, illustrations and interaction between the narrators and the three students. In the explanation, one narrator acts as a female senior of the students, and is called Lucy in the drama. She gives advice to the students concerning computer ethics. The other narrator is an anonymous male who explains the technical terms.

Some problems in the drama have no ‘correct’ answer and are designed to prompt discussion in a class session. There is also an episode which is not followed by an explanation.

For example, these video clips can be used as follows in a class.

1. Show an episode to students.
2. Discuss the episode in the class
3. Show its explanation to students.
4. Discuss the explanation in the class
5. Assign a paper on the basis of the clip and discussions.

These clips are classified into four topics, i.e., stories concerning the followings:

- (1) Network security (virus, spyware, web bug, cross-site scripting),
- (2) Communications through the network (e-mail etiquette, managing a web forum),
- (3) Copyright and accessibility on web pages,
- (4) Phishing and privacy.

We endeavored to include the latest cases occurring in the real world into the video clips.

Table 1 shows the duration of each clip. Table 2 lists synopses of all clips in the “video clips 2” [5].

Table 1. Clip titles and duration in the “video clips 2”

No.	Title of the clip	Episode	Explanation	Subtotal
1.	Computer Worm	3'30"	1'10"	4'40"
2.	Spyware	3'31"	3'43"	7'14"
3.	Dangerous HTML mail	1'38"	2'12"	3'50"
4.	Malicious Web Page	5'42"	4'17"	9'59"
5.	Etiquette in mail communications	2'08"	3'30"	5'38"
6.	Privacy of mail	5'05"	0	5'05"
7.	Managing a Web forum	2'21"	3'31"	5'52"
8.	Anonymity and manner on a web forum	3'36"	1'52"	5'28"
9.	Private use of copyrighted material	2'20"	3'02"	5'22"
10.	P2P and broadcasting rights	3'17"	2'53"	6'10"
11.	Quotation	3'13"	4'10"	7'23"
12.	Rights of portrait	1'14"	3'45"	4'59"
13.	Web accessibility	2'55"	1'53"	4'43"
14.	Responsibility of public relations	5'50"	2'41"	8'31"
15.	Do away with a PC	2'11"	1'46"	3'57"
16.	Pyramid selling	3'13"	3'11"	6'24"
17.	Phishing	2'54"	3'36"	6'30"
18.	Trickery bill	2'41"	1'22"	4'03"
19.	Digital shoplifting	2'16"	1'07"	3'23"
20.	Using Private information	3'21"	2'58"	6'19"
	Total length	1h2'56"	52'39"	1h55'35"
	Average length	3'09"	2'46"	5'55"

3. MAKING THE VIDEO CLIPS

We spent about one year making the “video clips 2”. Table 3 shows the schedule of the project [5].

We made the video clips with a partner production company. The process of making the video is as follows: We proposed ideas for the clips, and a professional writer developed interesting scenarios. After filming in a studio and on location, narration and music were added. The main narrator is a popular disc jockey of a major FM station in Japan. She provided up-tempo spice to the video. The other narrator is a professional. The three students were acted by professional actors.

We supervised the entire production process. We corrected the scenario and illustrations with the production company. We also monitored the filming and recording sessions.

Table 2. Synopsis of the “video clips 2”

CHARACTERS	
Masami: a female university student. theoretical and stouthearted Yukie: a female university student. cheerful and lively Shunsuke: a male university student. self-confident of his computer ability, but somewhat timid	
Section 1. Network security	Section 2. Communications through the network
4 Computer Worm Yukie is assisting managing a PC at an NPO. The PC has been acting strangely since this morning. The PC was protected by an antivirus software and the software was updated.	5. Etiquette in mail communications Yukie submits a paper to a teacher as an attachment to an e-mail. Shunsuke sends a mail from his mobile phone to a senior who is now working. Both of them are scolded by the receivers.
5 Spyware Masami is being inundated by spam mail. She has no idea where her private information is being leaked. Shunsuke suspects free software.	6. Privacy of mail Shunsuke's friend has run away from home. The friend sends a mail to Shunsuke. However, Shunsuke has no idea where is he. The friend's mother asks Shunsuke to show her the mail.
6 Dangerous HTML mail Shunsuke is receiving mail from a lingerie shopping site. He says that he has never registered his address at the site. He merely clicked on an article in a HTML mail.	7. Managing a Web forum Masami receives a mail which requests the deleting of a message on a web forum managed by Masami. She is worried about it.
7 Malicious Web Page Yukie is interested in fashion. She is introduced to a shopping site by a chat friend. She registered her credit card number at the site. After that, she receives a huge bill in spite of never having shopped at the site.	8. Anonymity and manner on a web forum There is a message which insults their friend on Masami's web forum. Masami suspects Shunsuke even though the message was anonymous. She shows the evidence to Shunsuke who pretends innocence.
Section 3. Copyright and accessibility on web pages	Section 4. Phishing and privacy
9. Private use of copyrighted material Shunsuke tries to send an MP3 music file to his brother's friend, but Masami stops him. Shunsuke insists that it is for private use.	15. Do away with a PC Shunsuke is interrogated by a professor because his club members list has fallen into the hands of an unscrupulous businessman. He has no idea how the businessman obtained it.
10. P2P and broadcasting rights Yukie forgot to record a TV drama. Shunsuke suggests using a P2P file-sharing software to find a recording of the drama. Masami objects to this because she thinks that it is illegal.	16. Pyramid selling Yukie receives a direct mail which says “I will give you secret information which guarantees that you can make lots of money in a network business”. She explains it to Masami and Shunsuke. However, they are taken aback.
11. Quotation Yukie is writing a paper. The paper includes quotations of other people's work. Shunsuke thinks that it is a violation of copyright. Yukie and Masami say that they are quotations so it is not a violation of copyright.	17. Phishing Shunsuke receives a mail from a shopping site that says, “You have been chosen for a sale campaign. If you fill in the application form on a special web site, you receive lots of money.”
12. Rights of portrait Yukie, Masami and Shunsuke uploaded pictures of their class party onto their web site. Only Yukie receives complaints from her friends.	18. Trickery bill Shunsuke receives a mail with a bill. He has no idea what it is for. He worries whether to pay it or not.
13. Web accessibility Shunsuke's grandfather asks him to make a web site for the association of the elderly residents in his neighborhood. He makes the web site and he is proud of it. However, Yukie and Masami pointed out the site's weak points.	19. Digital shoplifting Yukie takes a picture of an article in a magazine in a bookshop using her mobile phone. Masami cautions Yukie that it is shoplifting. Yukie denies it.
14. Responsibility of public relations Masami posts an invitation to a talk on her web site. Shunsuke transfers that page to his web site. However, he doesn't know the date of the talk has been changed.	20. Using private information Yukie is worried about an incident in which customers' private information has been leaked from a major shopping site. On the other hand, Masami notices that the management of private information collected by a survey has a problem.

4. STUDENTS' RESPONSES

In this section, we show the result of the survey how the quality of the video clips was.

We showed some of the video clips to the freshmen of Hokkaido University. In order to compare the “video clips 2” with the “video clips 1”, we chose one clip from the “video clips 1” and five clips from the “video clips 2”, then showed these six clips to the students in the following order[1].

- Do away with a PC (Clip 15)
- Using private information (Clip 20)
- Personal Web page (in the “video clips 1”, Clip of Vol.1)
- Citation (Clip 11)

- Private use of copyrighted material (Clip 9)
- P2P and broadcasting right (Clip 10)

The students were majoring in various areas of study including natural sciences and liberal arts.

Figure 1 represents the results of the survey showing how interesting (a), how useful (b) and how easy to understand (c) the video clips are. In this figure, the students' majors were not discriminated. In the survey of how interesting the video clips are, we could see the following.

Table 3. Schedule of the project

Date	Activity
2 and 3 Mar. 2004	Project meeting by the authors.
Apr. to Jul.	AEICP and NIME discussed the production of the computer ethics video clips
End of Jul.	Decision by AEICP to produce the clips by accepting NIME's suggestion.
5 Aug.	AEICP formed the production task force. The members are the authors.
17 Aug.	Task force meeting to decide the specifications of the video clips.
Aug. to Oct.	The task force devised the original scenarios of the video clips
12 Nov.	Explanation of the production to the candidate of partner production companies.
26 Nov.	Receive the candidate synopses from the candidate companies.
6 Dec.	Evaluation of the synopses by the task force
27 Dec.	Selection of the partner production company.
10 Jan. 2005	Meeting of the task force and the partner company
11 Jan.	Audition of the actors.
6 to 24 Jan.	Scenario writing
29 Jan. to 5 Feb.	Filming
7 Feb. to 3 Mar.	Editing
6 Mar.	Narration recording
15 Mar.	Sample DVD

- (1) The proportion of negative answers (not interesting) was about 10%.
- (2) Although the students watched the six clips in one class session, actually in 90 minutes, they got more interested in the last three clips. This suggests that the students did not grow bored with these clips.
- (3) The clip from video clips 1 was not as interesting as other clips of video clips 2.
We are going to analyze these in greater detail.

In the survey of how useful the video clips are, we could see the following.

- (1) The proportion of positive answers (useful) was more than 70%. It can be said that the video clips are accepted by students.
- (2) The usefulness of clip "P2P and broadcasting rights" was lower than others. The reason could be that the students did not understand the story since we did not show the explanation part of this clip to students before this survey.

In the survey of how easy to understand the video clips are, we could see the following.

- (1) The average proportion of positive answers was about 60%. However, there are certain clips which have a high proportion of positive answers and other clips which have a low proportion of positive answers. The proportion of

- positive answers for the clip "Do away with a PC" was about 70%. On the other hand, the proportion of positive answers for the clip "P2P and broadcasting rights" was about 50%. The reason again could be that we did not show the explanation part of this clip to students before this survey.
- (2) We had already obtained the survey result that the understandability score was higher than the usefulness score for the clips of "video clips 1"[8]. On the contrary, the usefulness score exceeded the understandability score for the five clips of "video clips 2". The reason of the inversion might be twofold. One is that "video clips 2" contains more advanced issues than "video clips 1". The other is that recent trends of public opinion are of greater interest in computer ethics concerning the problem of private information.

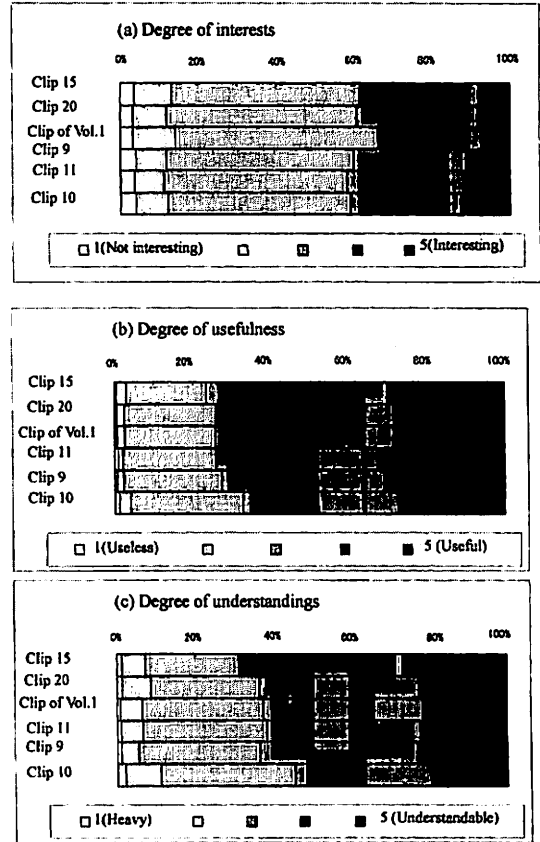


Figure 1. Results of the survey showing how the video clips were interesting, how useful and how easy to understand.

In the paper[8], we had shown the relationship between the usefulness score of the "video clips 1" and the students' major. That is, all clips of the "video clips 1" were useful for students in humanities, but some were not so useful for the students in the science and engineering majors. This result helped us to consider

the scenario of the "video clips 2".

Figure 2 show the interest, usefulness and understandability of the clip "Do away with a PC" in the "video clips 2". Category 1 denotes the computer science major, Category 2 denotes the humanities major, and Category 3 denotes the science and engineering major excluding the computer science. The three graphs in Figure 2 show no clear dependence on the students' major in the degree of interest, usefulness and ease of understanding. It can be conceived that the level of difficulty of the video clips was appropriate. This means that the "video clips 2" has improved a weakness of the "video clips 1".

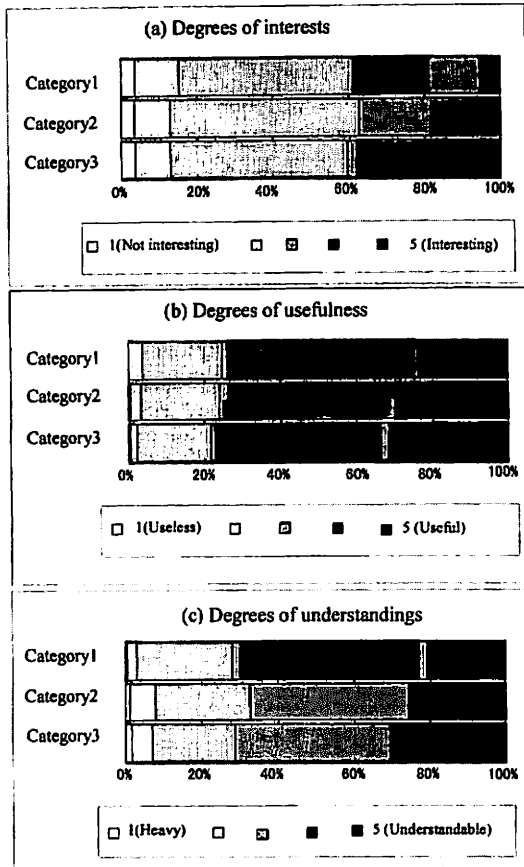


Figure 2. Result for "Do away with a PC" discriminating the major of students. Category 1 is computer science students. Category 2 is natural science students other than computer science. Category 3 is liberal arts students.

The followings are the results of this survey.

- Students are very interested in news about private information. Forty percent of students replied "Yes" to question (3). Only 20% of students were unfamiliar with the news. Ninety-five percent of students replied "Yes" to questions (4) and (5).

- On the other hand, students did not know the technology and terminology of IT very well. For example, 80% of students replied "No" to question (6). Only 4% of students know how to control access to a web site. Fifty percent of students said that they know it can be controlled but not how. Only 50% of students replied "Yes" to question (1). Forty-five percent of students replied "No" to question (8).

5. EFFECT OF THE STRUCTURE

Each Clip of the "video clips 2" was split into an episode and its explanation. In this section, we show considerations for the effects of this structure on the prompting thinking and discussion.

In the survey of section 4, we did not show the explanation part of the clip 10, "P2P and broadcasting rights".

After showing the episode of the clip 10, we asked students the following[1].

"Which of the following has the right to broadcast a recorded TV drama in public? The person who recorded the drama?: The broadcast company who has the right to broadcast the TV drama in public?: The producer who made the drama?"

The proportion of students who answered the correct answer, which are the broadcast company and the producer, was 46%. It can be said that the episode part of the video clips was difficult enough to get the correct answer without seeing the explanation part of this clip. In spite of this difficulty, students thought that the episode is interesting, according to the survey of section 4. So it is easy to use this clip for prompting discussion and thinking in a class session.

We had a presentation on the "video clips 2" at the ACM SIGUCCS Fall 2005 conference, which includes the showing the episode and its explanation part of clip 7, "managing a web forum"[9]. The clip was subtitled in English. The number of audiences was about 50. We got feed backs from 31 of audiences. The feed backs include how the content is useful and how I will use this information. Table 4 shows the feed backs.

Table 4. Feed back of the presentation at ACM SIGUCCS Fall 2005 Conference.

	Content is useful	I will use this information
Extremely	8	12
Very	15	16
Some what	8	3
Not at all	0	0
Not applicable	0	0
Total	31	31

These feed backs did not include whether the structure of these video clips is good or bad. However, there was no negative answer on usefulness of our video clips. We thought that the structure of our video clips was acceptable by people who are in charge of computer ethics education.

In order to get more detail effect of the structure of video clips, we are investigating our video clips now.

6. RELATED WORKS

As in the article of Kurata, good effect of video material for computer ethics education was reported[4]. The video in the Kurata's article is general purpose material for introduction of using computer in a university while our video clips are the special purpose material for computer ethics education. The article of Kurata doesn't include numerical data of how the video good was while we showed that.

Jones said that thinking is important in computer ethics education[3]. Tatsumi and Kusumoto reported that computer ethics classes with thinking and discussion succeed greatly[6]. A class with thinking and discussion is also mentioned in the article of Kurata. Our video clips can be used to promote thinking and discussion of trouble cases. The teacher can show only the drama part to students in order to make them think about it and discuss it in class. There also is a clip which does not have an explanation part. Students must think how to cope with this case. We have not investigated enough that how the structure of our vide clips is useful for a class with thinking and discussion. We are going to investigate this subject further more.

INFOSS[2] is an e-Learning system for computer ethics education, which is widely used in Japanese universities. INFOSS is a kind of electronic book, while our vide clips are video material for a class, which provide realistic experience for the students.

7. CONCLUDING REMARKS

In this paper, we presented a digital video on computer ethics in higher education, which helps students learn what kinds of incidents they might encounter in cyber space and how to cope with them. Some problems presented in the clips have no 'correct' answer and are designed to prompt discussion in a class session. We also described the making of the video clips, and we have surveyed the students' responses. The results indicate the video clips to be interesting, useful and easy to understand for most students. Students' majors did not strongly affect the result of the survey. We considered the effect of the structure of our video clips. We would like to conduct more surveys about these video clips and improve them in the future.

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