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COMPUTER INTEGRATED CLASSROOM (CIC) TECHNOLOGY TOOLS: INTERACTIONS FOR KNOWLEDGE CONSTRUCTION

ABDUL RAHIM HJ SALAM
ZAIDATUN TASIR
ADLINA ABDUL SAMAD

INTRODUCTION

Computer Support in the Microteaching module for ESL Pre-service Teachers

Microteaching module for pre-service teacher has always been traditionally conducted in a face-to-face classroom manner. These pre-service teachers discuss, teach, reflect and provide feedback without any compilations of their recordings, storing, retrieving as well as organization of inputs during their microteaching activities for reference. Undoubtedly, these trainees have not been given computer assistance in enhancing their lesson planning ideas and contents. Trainee teachers are yet to be optimistically introduced to using technologies and computers to support or facilitate their microteaching activities. Thus, it is a practical move to integrate a computer support pedagogical solution for the trainee teachers during their microteaching activities so that trainees could optimize their peer responses through network learning resources and personal reflection even systematically. From the pilot study conducted, CiC was piloted

to ensure that the system can really be considered pedagogically helpful for ESL pre-service teachers. This paper will elaborate on the specific tools in CiC that are necessary for the execution of this study.

Why Computer Integrated Classroom Environment?

Computer Integrated Classroom (CiC) could be looked upon as the future pedagogical practices in schools and higher institutions. CiC is seen as a way to integrate face-to-face in a CSCL setting. What happens in this environment is similar to a typical classroom situation where a group of learners sit together to discuss a topic. The assumption is that these collaborative situations can be improved with the appropriate collaborative technology. Overdijk, W. and Diggelen. A. M. (2006), stated that "studying this complex interplay within a collaborative classroom setting has hardly been addressed in educational research and practice." In fact there is a high probability that tomorrow's learning will still take place in schools where learners meet face-to-face to collaborate, discuss and solve problems. These face-to-face learning situations are largely ignored by much of current research into computer-supported collaborative learning.

CSCL research mainly focuses on situations like distance collaboration, online learning and virtual teaching. Unfortunately, use and capability of CSCL has not been maximized to record learners' interaction or cognitive process of responses and feedback. Findings in CSCL research show that there is need for a setting which reciprocates face-to-face interaction with respect to media richness: "the medium's capacity for immediate feedback, the number of cues and senses involved, personalization, and language variety" (Rice, 1993, pp.452-453). In fact, learners rate text-based CMC as low in media richness as it restricts both their vocabulary for expressive and direct communication for accomplishing certain tasks such as decision making. According to Lengel and Daft (1988), learners rated face-to-face communication to be the most media rich and in this situation, media-poor, text-based CMC impacts the level of communication

and, thus, social interaction. In this case, the integration of CSCL with face-to-face communication is of great relevance to be studied. Certainly, with the accessibility of CiC infrastructure, this study can fill the gap left in CSCL, thus expand this research.

It is noticeable that lacking media richness might not be enough to invoke a sense of openness and honesty for genuine response and feedback to occur. Rourke (1998) remarks that "if students are to offer their tentative ideas to their peers, if they are to critique the ideas of their peers, and if they are to interpret others' critique as valuable rather than as personal affronts, certain conditions must exist. Students need to trust each other, feel a sense of warmth and belonging, and feel close to each other before they will engage willfully in collaboration". Thus, the inclusion of elements in face-to-face peer response is necessary to reciprocate the issue. These statements bring about the idea that more studies in CSCL area with the integration of face-to-face elements are necessary to find out the extent of cognitive activity elements the learners (teacher-trainees) use during the peer response to lesson plan activity.

How do the tools benefit the ESL teacher trainees? How does peer response take place with the assistance of the tools in contributing to the construction of knowledge? These are the questions that the researcher hopes to answer in this paper.

Methodology for Data Collection

This pilot study was characterized by the use of qualitative methods of data collection. Quantitative studies emphasise measurement (in terms of amount or frequency) whereas qualitative inquiry emphasises process and meaning (Denzin and Lincoln,1998). In this study, the researcher examined the process of constructing knowledge through peer response to lesson plan activities among ESL teacher trainees. The aim was to be able to examine the process in terms of the accomplishments of the participants in developing knowledge about the lesson plan and teaching at large. As Denzin and Lincoln (1998) claim, the emphasis on process requires an interpretive, naturalistic

approach that examines phenomena in their natural settings "attempting to make sense of, or interpret, phenomena in terms of the meanings that people bring to them" (p.3). In the present study, the role of peer-interaction in knowledge construction development was examined in a face-to-face classroom setting in natural conversations among learners with the integration of CSCL setting.

The pilot study was conducted from an interpretive framework, rather than a positivistic one. Positivism poses that through carefully designed studies, researchers can achieve accurate and unambiguous knowledge of a particular issue (Crotty, 1998). In using an interpretive approach, the researcher was not concerned with testing a hypothesis. The study was not conducted in an experimental situation in which variables are controlled in order to determine their effect on other variables. In order to address the research questions, the researcher was not interested in quantifying the interactional mechanism used by learners in the classroom. With the assistance of CiC, the researcher explored those mechanisms with the purpose of describing them and interpreting their impact on knowledge construction.

Implementation of the Study

Computer Integrated Classroom (CIC) in this study consists of a local area network (LAN) infrastructure, hardware and software capable of facilitating synchronous text-based as well as verbal communication between subjects. The LAN was set up in a digital language lab with partitions separating each of the microcomputer workstations. Windows 2000 server is the network operating system with full multitasking and distributed processing features. There are 2 servers specially configured to enable CIC to function: Communication server (Dglabac) and Media Server (Dglabam). The former server functions in determining the subjects' internet protocols (IPs) to ensure interconnectivity among or between subjects/workstations. The later server is dedicated for data or media storage of works done by subjects. Apart from individual computer and designated media server, software tools; namely, Sanako Lab 300, Sanako Study 300

and Sanako Media Assistant have made it possible for the activities during microteaching course to be implemented.

Sanako Lab 300

Sanako Lab 300 is a classroom management program software designed to assist teaching and learning via LAN. In order for the tool to function, this program has to be linked to workstations (students' PCs) via Computer Supervisory System (CSS) hardware that offers a graphical interface.

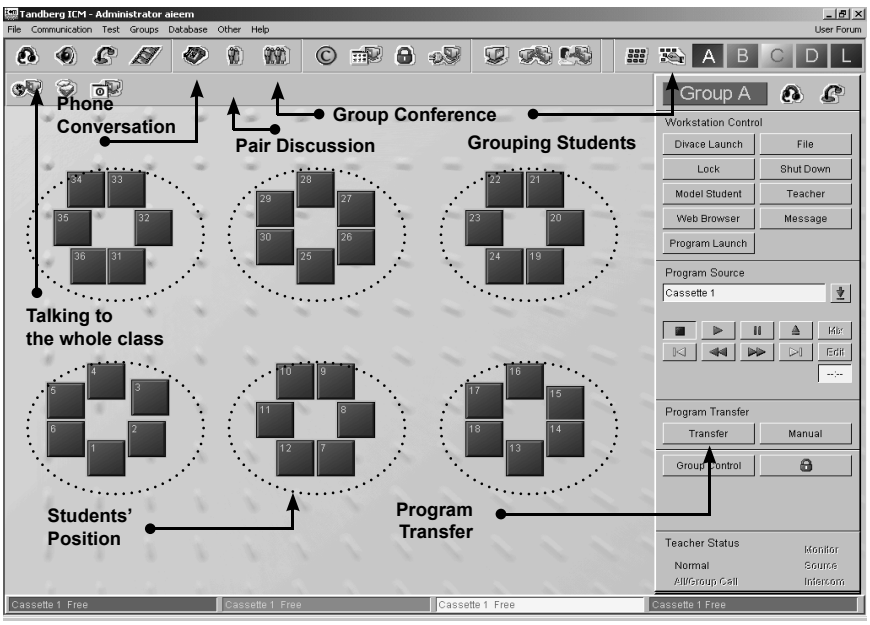


Figure 1: Interface of Classroom Management System (Sanako Lab 300)

The interface includes among others; group selection, chat, phone, program source, file transfer and message distribution that responds to the manipulation of the researcher's purpose. As shown in figure

1, it allows the researcher to activate specific classroom instructions by choosing specific icons on the screen of the researcher's pc to any positions of the students. In relation to this study, the researcher managed among others to activate and execute some of the program as follows:

a. Subjects were grouped and put in a "pair discussion" command. This enabled them to interact verbally with one another through a communicative tool called Sanako Media Assistant (SMA). The communicative too appeared on the students' screen. With headphones and microphones as well as SMA available, subjects were able to record, retrieve and listen to the interaction easily.
b. By activating the "communication-chat" icon, subjects were able to execute text-based chatting to communicate with one another.
c. For input purposes, the researcher transferred video, audio or document files to chosen students' workstations as he deemed fit.
d. The researcher could control and monitor the individuals' workstations as he desired by activating "workstation control".
e. In addition to that, the audio interaction as well as text-based interaction were recorded and saved in a designated folder created for the study located in the media server (Dglabam).

Sanako Media Assistant

This software is integrated with Sanako Lab 300 for the purpose of recording and playing audio video file as well as functioning as a communication tools for the subjects.

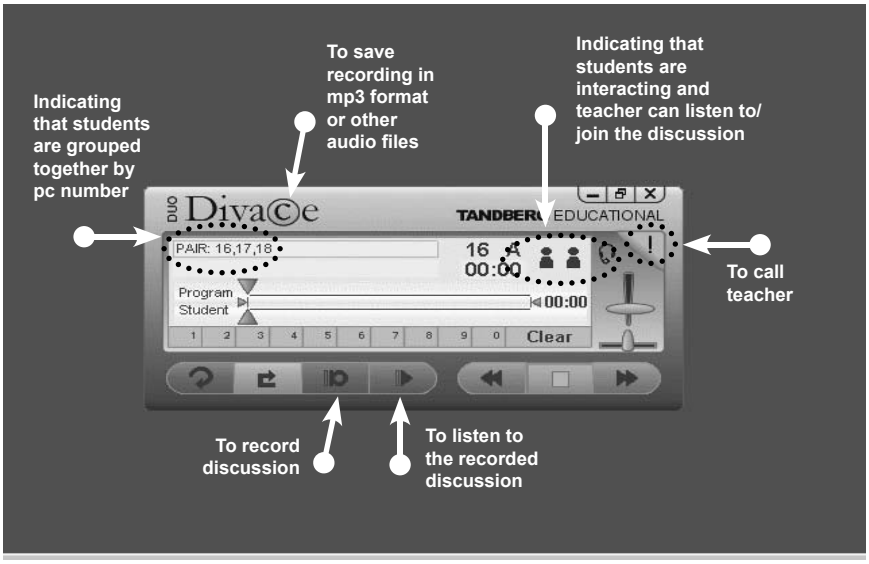


Figure 2: Media Assistant Software Interface

For this particular study, the subjects were grouped to do discussions using the tools of Sanako Lab 300. This was indicated by the pc number appeared at the top left hand corner of SMA as depicted in figure 2. This software allows the subjects to interact with the researcher individually or as a group by clicking the "exclamation" mark appeared on the SMA. Looking at the feature of SMA, subjects were able to save, record, play and listen to the activity easily according to their own pace. In fact this software could also create a digital learning material (audio or video) for classroom teaching as well as self-access learning.

Sanako Study 300

The library pilot software (Study 300) linked to the media server is considered as a resource for information management. This can be

used by the researcher as well as the subjects. Specifically, it was used by the researcher to do the following tasks for the study:

a. To record the profile of users or subjects. This had to be done so that only the registered users could access the resources. Subjects were given their usernames and passwords to access the software. This requirement appeared every time they logged on to the pc. This is shown in figure 3. The researcher created the users or subjects' profile according to courses enrolled. This is depicted in figure 4.

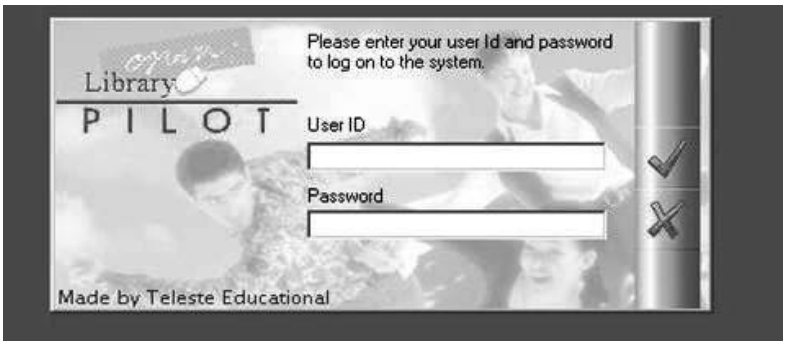


Figure 3: Sanako Study 300 Library Pilot Log on Interface

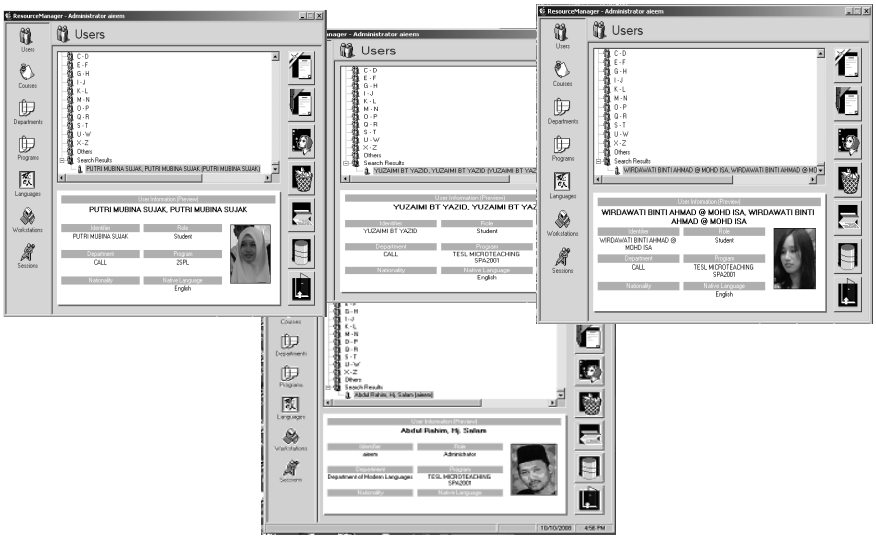
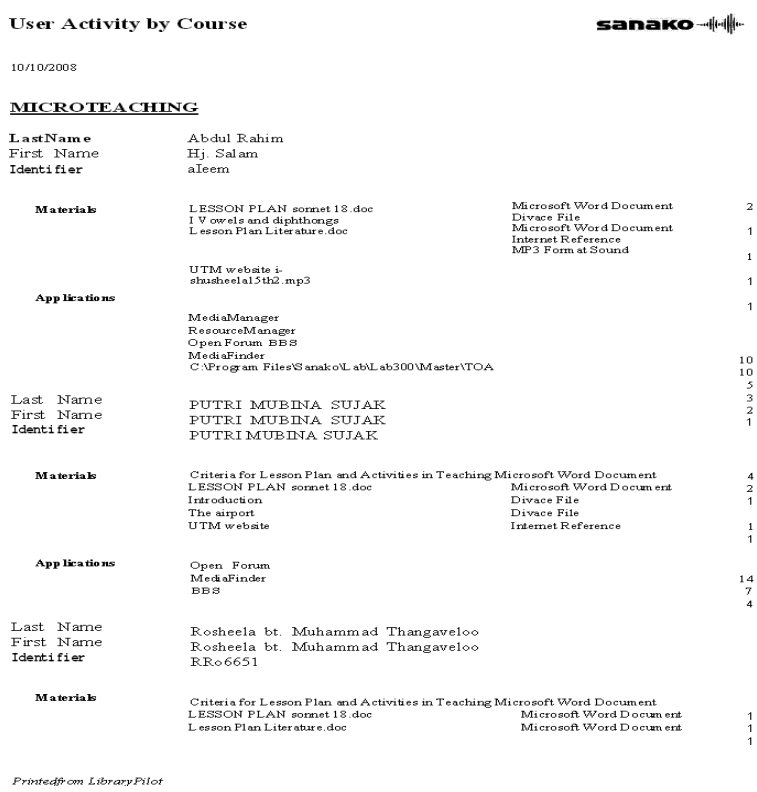


Figure 4: Example of users' profiles interface

b. To upload and download digital resources. The uploading was done by the researcher to ensure that the resources available in Sanako Study 300 were helpful to the students. Certainly, this allowed the subjects to download the necessary materials (document, audio and video) as well as internet resources to enhance their information about issues discussed.

c. To track activities done by the subjects. The researcher could monitor and track the activities automatically once the subjects entered their usernames and password. As depicted in figure 5, the tracking showed the users, materials, application and usage frequency.

d. To allow forum application for subjects to interact using text-based forum apart from face-to-face verbal discussion.



User Activity by Course sanako

10/10/2008

MICROTEACHING

LastName	Abdul Rahim		
First Name	Hj. Salam		
Identifier	aleem		
Materials	LESSON PLAN sonnet 18.doc	Microsoft Word Document	2
	I V owels and diphthongs	Divace File	
	Lesson Plan Literature.doc	Microsoft Word Document	1
		Internet Reference	
		MP3 Format Sound	1
	UTM website i-shusheela15th2.mp3		1
Applications			1
	MediaManager		
	ResourceManager		
	Open Forum BBS		
	MediaFinder		10
	C:\Program Files\Sanako\Lab\Lab300\Master\TOA		10
			5
Last Name	PUTRI MUBINA SUJAK		3
First Name	PUTRI MUBINA SUJAK		2
Identifier	PUTRI MUBINA SUJAK		1
Materials	Criteria for Lesson Plan and Activities in Teaching	Microsoft Word Document	4
	LESSON PLAN sonnet 18.doc	Microsoft Word Document	2
	Introduction	Divace File	1
	The airport	Divace File	
	UTM website	Internet Reference	1
			1
Applications	Open Forum		
	MediaFinder		14
	BBS		7
			4
Last Name	Rosheela bt. Muhammad Thangaveloo		
First Name	Rosheela bt. Muhammad Thangaveloo		
Identifier	RRo6651		
Materials	Criteria for Lesson Plan and Activities in Teaching	Microsoft Word Document	
	LESSON PLAN sonnet 18.doc	Microsoft Word Document	1
	Lesson Plan Literature.doc	Microsoft Word Document	1
			1

Printed from LibraryPilot

Figure 5: Interface of user tracking activities in Sanako Study 300.

Implementation of the Computer Support

In order to ensure stability of access and connectivity, this study used a classroom local-area networks or computer integrated classroom (CIC) for the execution of activities. This networked infrastructure has created a learning environment that offers interactivity among peers and machines. (Southworth, 1988).

For the pilot study, the issue of integrating face-to-face discussion through networked environment was investigated. As depicted in figure 6, ESL teacher trainees in pairs discussed a lesson

plan using a local area networked classroom setting (via computer terminal). Since the learning that occurred in CSCL environments was heavily dependent on verbal interaction, it should be important to identify potential operative factors in the communication activity that might reveal components of a learning process. To this end, the exploration and explanation on events that involved learners' cognitive participation was emphasized. In order to see this, verbal elements representing cognitive and collaborative activities were identified in the content of the group communications.

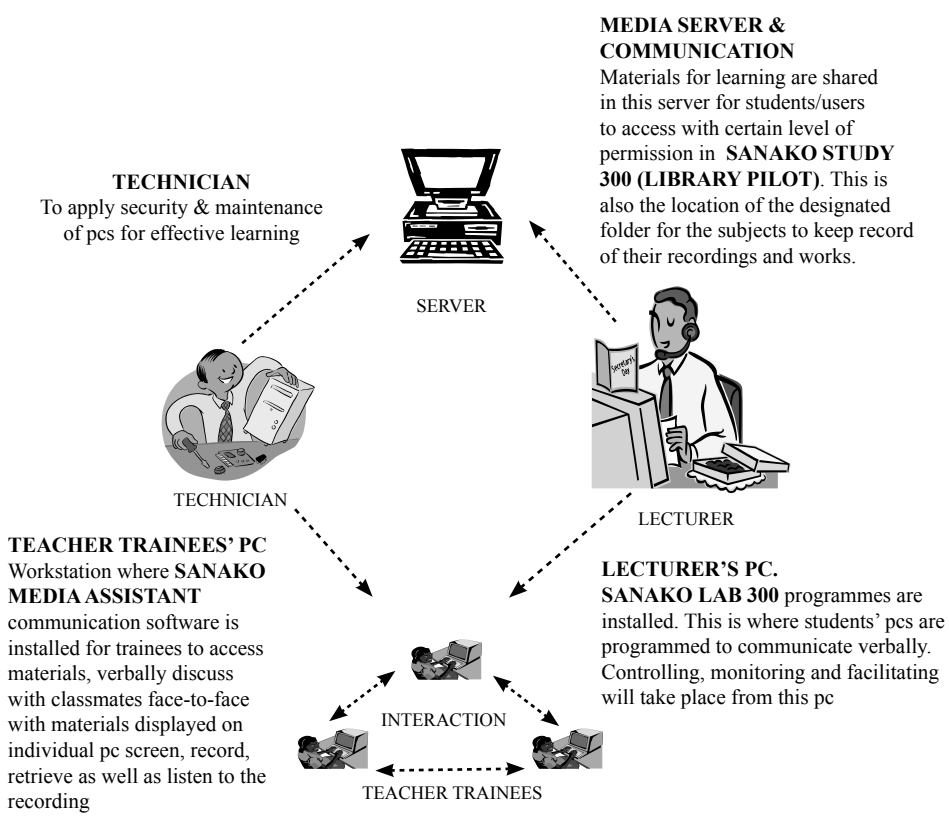


Figure 6: The CiC structure for this study

CSCL in this feasibility study involved collaborative learning that included both: groupings of learners around computers, as in conventional classroom arrangements; and groupings of learners via computer networks. The investigation applied only to human-human communication via computer networks. This reflected the emphasis of this study on "computer supported collaborative learning" and was intended to emphasize the verbal interaction that took place between collaborative ESL teacher trainees. They were linked through computer networks with the assistance of software tools.

The software tools (Sanako Lab 300, Sanako Media Assistant and Sanako Study 300) were pilot tested at the Digital Language Lab UTM on ESL pre-service teachers. Four ESL pre-service teachers doing their microteaching activities at the Digital Language Lab participated in a run-through of the procedures and produced certain parts of initial transcripts.

Data collected throughout a 3-week period. Those verbal response sessions were digitally recorded using Sanako Media Assistant with Lab 300 classroom information management system. This software is integrated in a system that enables users to be grouped, hence allowed to verbal interaction in a face-to-face setting to take place synchronously.

The recording of these sessions were not videotaped for the purpose of capturing the non-verbal behavior, because the subjects were not expected to use gestures to compensate for their linguistic knowledge gaps. Subjects were digitally connected as a group for the discussion to take place. They needed to put on the headphones with microphone attached in order to communicate with each other and visible to one another.

The researcher also created a specific folder for the pair in a media server. The folder was secured in such a way that only the group was able to access it. Collection, storage, and retrieval of recordings in the folder were handled by the media server (Dglabam). At anytime, the researcher could access the data and analyze accordingly.

CONCLUSION

This trial study shows that the CiC can facilitate the face-to-face collaborative learning in a CSCL setting. For that matter, ESL pre-service teachers could benefit from LAN infrastructure and software tools that should be integrated in CiC. Looking back at this study that is parallel to the nature of CSCL, all activities and events are being implemented via technology. Sanako Lab 300 was used to control the pairing and grouping of participants as desired. By activating the pairing or grouping program in Lab 300, Sanako media assistant communication software automatically helps ESL pre- service teachers to communicate with one another verbally without any difficulty which could encourage rapid feedback as well as media richness. At the same time, the Lab 300 allows researcher to dedicate similar screen for every subjects to view and access helpful resources or references for more ideas and contents. In fact, with CiC system participants could record, save, retrieve and listen to their interaction, the researcher can easily access the data instantly for analysis purposes. Apart from verbal output, this system allows chat program as well as forum application to function as an effective mediator to the synchronous text-based peer communication. With the uploaded materials available in the digital media resource library or Study 300, participants are more resourceful in their interaction and knowledge construction. Participants' selections track of computer activities can also be monitored automatically by Study 300. In short, data based on the trial sessions conducted show that these tools are appropriate for facilitating the study of CSCL in various interaction modes including computer support for face-to-face collaborative learning (COSOFL).

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Southworth, J.H.(1988). The Hawaii Global Teleclass Project And Multimedia Computer-Based Educational Telecommunication (CBET). In Ambron, S. & Pennington, R. (Ed.), *Toward A Seamless Society: Networking In Education, (pp.* 273-294). Apple Education Advisory Council Cupertino, CA.