Use of digital video technology in an elementary school foreign language methods course

Hsueh-Hua Chuang and Marcia Harmon Rosenbusch

Dr Hsueh-Hua Chuang is an assistant professor of Center for Teacher Education at National Chiayi University in Taiwan. Her research interests include faculty technology professional development and technology adoption in schools. Address for correspondence: 85 Wenlong, Mingsuin, Chiayi, Taiwan 621. Email: hhc@mail.thu.edu.tw. Dr Marcia Harmon Rosenbusch is Director of the National K-12 Foreign Language Resource Center (NFLRC) at Iowa State University. The mission of the NFLRC is the improvement of student learning of foreign languages in the nation. Dr Rosenbusch established and teaches in the elementary school foreign language teacher preparation programme at Iowa State University, Ames, Iowa. She focuses her research on early foreign language education. She received the Florence Steiner Award for Leadership in Foreign Language Education, Postsecondary, in 1996 and the Anthony Papalia Award for Excellence in Teacher Education in 2001. Email: mrosenbu@iastate.edu

Abstract
This article presents a case study of the use of digital video technology with a new pedagogical approach under a constructivist framework in an elementary school foreign language methods course. Data were collected through interviews with the methods course instructor, field notes, analytical notes from videotaped student presentations of their learning from the video clips, students’ mid-semester evaluation of the use of video clips, and end-of-semester student reflections on open-ended questions regarding the use of video clips. A careful examination of the data identified themes that illustrate the characteristics of the use of digital video technology under a constructivist framework. Those themes include the flexibility and capability of digital video technology, the development of the video clips, students’ ownership of knowledge, feedback from the students, and evaluation of the use of video clips. This case reports the vision of technology integration being realized. It results from the presence of technology, the instructor’s pedagogical knowledge, and his or her content expertise.

Introduction
Many efforts to reform education have involved attempts to introduce technological innovations into teaching and learning. An increasing body of literature argues that technology provides K-12 schools and teacher education programmes with a new vision for necessary reform (Becker, 2000; Means & Olson, 1997). Dede (2000) argues...
that the discussion of technology in education should not concentrate on comparisons of the efficiency of technology as an instructional tool to standard existing approaches for teaching conventional content. Instead, the goal of technology in education, especially with the advancement of more sophisticated computers and telecommunications, should focus on how to reach essential educational objectives in higher order skills and on the generation of collaborative knowledge (Bransford, Brown & Cocking, 1999). Newly developed and sophisticated technology tools, exciting new structures for active classrooms, and authentic, student-centered, and collaborative learning environments may now enrich curricula, enhance pedagogy, increase links between schools and society, and empower students (CTGV, 1997; Riel, 2000).

Research has offered evidence that preservice teachers experience a gap between their field experiences in pre-K-12 classrooms and the instructional techniques that they learn about in the methods course from the teacher preparation programme (Hughes, Packard & Pearson, 1998). Class observations and internship experiences can fail to provide preservice teachers with desirable teaching experiences and opportunities to observe expert pedagogy. Therefore, the need for preservice teachers to see field-based models of challenging, reform-oriented teaching in action is strongly expressed by some researchers (Dawson & Norris, 2000; Ferdig, Roehler & Pearson, 2002). To bridge the gap between the university classroom and pre-K-12 classrooms, emerging digital technology makes video cases of actual classrooms or video clips of exemplary instruction available to preservice teachers so that they can access actual classroom scenes and explore exemplary practices in an active learning environment (Ferdig et al., 2004; Krueger, Boboc, Smaldino, Comish & Callahan, 2004). Projects such as Integrating Technologies into Methods of Education (InTime) (Krueger et al., 2004) and the Reading Classroom Exploration (RCE) (Ferdig et al., 2002; Ferdig et al., 2004) are good examples of utilizing digital video technology from the field to provide teacher candidates with exemplary instruction from real classroom scenes in a systematic online environment.

Although InTime encourages methods faculty to revise their methods course for the purpose of technology integration, it also serves multiple purposes for other audiences such as preservice teachers. By offering field-based video scenarios for analysis within a model framework called Technology as Facilitator of Quality Education, InTime hopes to promote reflective thinking in effective technology integration in K-12 environments for both the methods faculty and students (Krueger et al., 2004).

The purpose of RCE is to situate preservice teachers in a meaningful context in the reading classroom through a collection of exemplary video cases from schools with a variety of instructional methods. The video clips demonstrate teachers in grades K-5 using different instructional groupings and formats. Hypermedia systems bring the real classroom to university classrooms and labs with several scaffolding strategies such as user control of information, on-demand access of video clips, texts, supplemental reading topics, individual journal entries, collaborative notes, and bulletin board discussion (Ferdig et al., 2004).
Researchers and educators have described the stages of technology integration as occurring in a hierarchical fashion (Bettes, 1994) or as a cyclic process in which the teacher evolves from a learner to a re-affirmer or rejecter (Sherry, 1998). Bettes (1994) specifically describes a hierarchy of three successive levels of technology integration: (1) the tool level; (2) the resource level; and (3) the integrative level. Intime and RCE serve as good examples of the resource level with an attempt to incorporate the integrative level. Both projects give learners immediate access to richer references and encourage learners to interact with original source materials and address the challenge, with the increased access to resources and to retrieve, organize, evaluate, and manipulate information.

**Purpose of the study**

In this study, we present an example of the integrative level of technology use in education. The study addresses the challenges of increased authenticity in real world problems that learners are able to examine to retrieve, organize, evaluate, and manipulate. This level brings about changes in elements of educational settings such as the role of teacher and student, the pedagogical approaches, and the way time is organised and even changes in the hierarchical structure of the institution. Therefore, the purpose of this study is to present a case of the use of digital video technology with a new pedagogical approach under a constructivist framework in an elementary school foreign language methods course.

**Theoretical background**

Computer-related technology in the classroom has evolved over time. In the early 1980s, computer-based education, computer-based instruction, and computer-assisted instruction were terms referring to any use of the computer as a supplement to conventional instructional procedures, which implies that the learning objectives are clearly identified and stated and exist apart from the learners themselves (Cotton, 1991). From the 1990s, primarily as a result of the advancement of communication technology and its capability to provide an interactive environment, constructivism within the context of technology-mediated education has contributed to the vision of ‘authentic, challenging tasks as the core of education reform’ (Means & Olson, 1997, p. 4).

Constructivism as a learning theory stresses the importance of the individual’s own building of knowledge and is rooted in the philosophical paradigm that there is no absolute truth. Instead, truth or knowledge is relative and subject to each individual’s experiences within his or her own context. Both Vygotsky’s focus on social interaction and Piaget’s ideas on cognitive adoption have contributed in grounding constructivism by providing a psychological theory of learning (Fosnot, 1996). Others, like Cambourne (1988), emphasise the constructive nature of learning in scaffolding. The synthesis of these theories provides a basis for the psychological theory of constructivism. When applied in the classroom, constructivism emphasises that there is no ready-made knowledge, and learning is a constructive activity that the students
themselves have to carry out. Learners will thus claim ownership of their knowledge construction.

For social constructivism influenced by Vygotsky, constructivists believed that knowledge is constructed socially using language, thus, different social experiences result in multiple realities. Constructing knowledge is a social linguistic process with a gradual advancement of understanding built upon prior knowledge resulting in multiple dimensions of the truth (Spiro, Feltovich, Jacobson & Coulson, 1991). Vygotskian principles in the classroom emphasise that learning and development are social and collaborative activities and therefore, learning should take place in a meaningful context in which knowledge can be applied.

On the other hand, Piaget’s theory of intellectual growth was the primary influence on the development of the current constructivist position. Piagetian principles in the classroom focus on the freedom given to learners to understand and construct meaning at their own pace through personal experience working with the stages of assimilation and accommodation stages to achieve equilibrium. Piaget also emphasised that learning should take place among collaborative groups with peer interactions in natural settings (Wadsworth, 1978). Both principles encourage educators to recognise that learning is an individual process. In other words, students should be able to declare ownership of their knowledge.

In this study, an elementary school foreign language methods instructor took on a new pedagogical approach based on constructivism to adopt the use of digital video technology in her class. She facilitated her students’ experience in analysing the digital video clips through the way she organised the activity and through the guiding questions she prepared. She makes the point that many educational technology educators advocate that the presence of technology facilitates a transition to greater emphasis on constructivist and problem-based learning, which is not possible to achieve just through lectures (Means & Olson, 1997; Sprague & Dede, 1999).

**Background of the study**

Methods in Foreign Language Instruction: Elementary School is a course that is required at Iowa State University for students who are preparing to teach a foreign language at the elementary school level. As a new teaching strategy, the instructor provided short digital video clips of an elementary school foreign language (Spanish) classroom for student viewing and analysis on four occasions during Fall semester 2002. These video clips were selected by the instructor from digital videotapes she had recorded of the children’s Spanish classes at the 2001 Teacher Educator Partner Institute held in Princeton, New Jersey, funded by the U.S. Department of Education, International Education, Language Resource Centers.

**Data sources**

University students enrolled in the elementary school foreign language methods course in fall 2002 were the participants in this study. Human subjects’ permission was
requested and received from all students in this course. Fifteen students enrolled in the course but one student dropped the course early in the semester for a total of 14 subjects. To understand these students’ technology background, the instructor asked them to complete a form during the first class period to explore their past experience with email, listservs, World Wide Web, WebCT (an online learning platform), CD-ROM, Elmo (document camera), digital video camera, iMovie (a video editing application), and Chat. The result of this survey helped the instructor to group students of different technology experience in collaborative teams so the more experienced student could assist the less experienced students.

Data were collected through various sources: interviews with the methods course instructor, field observation notes, analytical notes from videotaped student presentations of students’ learning from the video clips, mid-semester evaluation of the use of video clips, and the end-of-semester course evaluation. A careful examination of the data identified major themes that illustrate the characteristics of the use of digital video technologies within a new pedagogical approach under a constructivist framework in an elementary school foreign language methods course. Those themes include the flexibility and capability of digital video technology, the development of the video clips, the learners’ ownership of knowledge, feedback from the learners, and evaluation of the use of video clips.

**Emerging themes**

**Flexibility and capability of digital video technology**

The instructor decided to take on the journey of exploring a constructivist teaching approach because of dialogues she had had with graduate students and in particular, because of her curiosity about constructivism in foreign language education. She had come to realise that she knew of no constructivist foreign language teachers.

The instructor began to ponder the possibility of teaching her own methods course in a more constructivist manner. Viewing two videotapes of constructivist teaching, she was interested in finding that constructivist teaching seems to involve posing good questions to scaffold students to explore and discover knowledge on their own. Thus, the instructor gained a new realisation about the important role of questioning strategies and the scaffolding efforts. She said:

I tried to think more about questions I could ask as I focused on the digital video clips. I designed guiding questions for students to use in analyzing the video clips. So that was really the launching of my first constructivist approach.

Digital video technology allowed her to manipulate, extract, and edit the segments that she believed would be meaningful for students because most of them had never before seen an elementary school foreign language classroom and had not had a chance to see expert foreign language teachers at this level.
Students were allowed to manipulate the digital video clips to pinpoint a segment in the clip to illustrate what they had learned from the analysis of the video clip. The instructor made available the video clips in streaming formats via her WebCT course site. The video clips, therefore, have the potential to be incorporated into other computer-mediated communication tools such as discussion forums and synchronous chatting. Those clips were made available as CD-ROMs for off-campus students who did not have high-speed Internet access. The availability of these cutting edge technologies allowed the instructor to explore the constructivist instructional approach.

Development of the video clips
As the instructor selected the video clips and viewed the clips a number of times, she formulated questions related to each video clip and conceived of the format of the video analysis sheet. As she transferred the clips into iMovie (a video editing software application) and re-recorded them on blank digital video tapes, she was able to think further about the questions she would ask to stimulate careful student viewing and analysis of the strategies and the impact of the strategies on student understanding and behaviour. Next, the instructor prepared a sheet of directions, questions to guide students in their viewing and analysis of the video clips, and space for students’ written observations and conclusions for each video clip.

The instructor ultimately identified four topics for each of which she selected five to eight short clips of 3 to 9 minutes. The four topics were: (a) teaching strategies in the first day of class; (b) teaching strategies in later classes; (c) teaching of reading in the foreign language; and (d) classroom management. For each clip, the instructor developed guiding questions to help students analyse the content.

Students’ ownership of knowledge
The instructor assigned each pair or group of three students a video clip on a CD-ROM (the first two occasions) or by streaming video (the last two occasions) on the WebCT course site that they were asked to view together on laptop computers in the classroom. Each group received a sheet of directions on how to complete the assignment and the 4 to 5 guiding questions that they were to use in analysing the video clip. Students were asked to write down their observations and conclusions to turn in at the end of class and to report these observations and conclusions to the class in 4 minutes or less. Each group was to choose a short segment of the video clip to show to the class to illustrate the points they were making in their presentation.

After the first use of the video clips in the methods course, the instructor reported that she had never seen before in her course a similar quality of student interaction as she did with the video clips. When the students viewed and discussed the digital video clips and presented their findings about the clip to the class, showing a short segment demonstrating their points, they were the experts. They taught their peers with conviction and passion about the teaching strategies they had observed. The instructor recalled that when she saw the students’ ownership of their learning, the moment was transforming for her.
Feedback from students at mid-semester

Advantages

Students identified the advantages of using video clips of elementary school foreign language classes in the methods course to be primarily the opportunity to view experienced and practicing teachers in their own classrooms:

The video clips allow us to see a wide variety of teachers and styles.

It takes us from our classroom to another in seconds and allows us to see the important highlights from lessons... .

Additionally, students valued the opportunity to see theory applied in practice and to view and analyse teaching strategies:

They make the theory we discuss in class clear as we see it in practice. It is a wonderful way to see/critique/learn from actual classrooms. They make what we are learning concrete. They also make me excited to teach because of the enthusiasm the kids show.

Disadvantages

Most students did not identify any disadvantages to using the video clips. Those who did noted that they only had the opportunity to view isolated lessons and could not see the larger picture, wanted to see more than one teacher, and could not get feedback from those involved in and affected by the children’s Spanish classes.

Presentation preference

Students were asked to evaluate their use of video clips in the methods course after having viewed video clips in two formats: (a) as CD-ROM and (b) as streaming video on the course WebCT site. Students were asked to identify which format they preferred and to explain their preference. Nine of the 13 responding students preferred streaming video on the course WebCT site, 1 preferred the CD-ROM, and 3 did not have a preference. The reason most frequently stated for students who preferred the streaming video on the course WebCT site was that they could access the clip later on their own:

... it’s more work on the professor’s end to put them on WebCT, but then we can watch them later if we choose.

Suggestions for use of clips

Seven of the 13 students liked the use of the video clips as they had experienced them and several mentioned the aspects they liked the most:

I like working with partners and having a discussion. I really enjoy the guiding questions. It helps me to realize things that I wouldn’t have caught if I just watched the clip.

A suggestion for change in the use of the video clips was to have students show the entire clip instead of just a segment when they share their learning with the class.
Value of video clips
All 13 students reported that they believed that the time spent using the video clips was well spent:

Yes, I do think the digital video clips are well worth our time. When I read text I have the videos to remember and [I] say [to myself] that I saw this technique implemented in the video I watched. Yes, it’s beneficial to observe how theories are applied in the classroom.

Evaluation of the use of video clips: course posttest
The first open-ended question to which students responded in the posttest related to students’ experience using the video clips. Eleven of the 12 respondents to the posttest (out of 13) answered ‘yes’ to this question, agreeing that the work with video of elementary school foreign language classrooms had affected their understanding of effective elementary school foreign language teaching. Several students found an important benefit of the video viewing was the opportunity to observe a real elementary school foreign language classroom in action:

... I got to see actual programs in progress. It was very helpful to observe, and not be involved.
... seeing an actual class helped me prepare for what my room may look like in the future.

Several students noted that the value of the video viewing was in having an opportunity to see the theory and strategies discussed in the classroom in action in a real classroom.

... it allowed me to directly see theoretical concepts learned in the course put into practice in the classroom. It gave me a more relational understanding and prompted me to reflect on my own future teaching practices.
... These videos helped me see real life application of the concepts that we discussed in class.

A benefit noted by one student was that the teacher in the video was a ‘quality teacher’; two other students suggested that viewing more than one teacher would be helpful.

Most feedback from the students was very positive and most of the students noted the value of viewing and discussing videos clips of a real elementary school foreign language class. The use of digital video technologies in a constructivist framework involved students in active learning with connection to real world problems.

Discussion
According to Wilson (1996), a constructivism classroom is ‘a place where learners may work together and support each other as they use a variety of tools and information resources in their guided pursuits of learning goals and problem-solving activities’ (p.5). The design of viewing digital video clips in this foreign language methods course corresponded to several features of constructivist learning environments as defined by Wilson. For example, students worked in pairs and analysed the digital video clips with the guiding questions to achieve learning goals.
The use of audio and video media is not a new phenomenon in the classroom according to Cuban (1986). Since the 1920s, the goal of education has been to convey facts, skills, and values and the main concern has been how to deliver these messages effectively and efficiently. The use of tools, machines, or in general, technology in education is to enhance teacher’s talk. Therefore, some devices or technologies are more or less connected with the enhancement of knowledge delivery from an authoritarian source, for example, radio and audio devices to record texts as an alternate way to understand content. These tools or media aimed to supplement traditional teacher-centred courses and provide an individualised instruction for students. These technologies do not require a significant change in classroom practices (Bettes, 1994).

This study provides an example of integrating digital video technology as a necessary component of the lessons or concepts being taught together with changes in the fundamental role of the teacher. In particular, the role of the instructor of this foreign language methods course changes from being the dispenser of knowledge to being a guide for student exploration.

Video technology becomes a catalyst for change; with this new pedagogical approach, it relieves the instructor from use of video clips in a passive mode in the classroom and provides opportunities for inquiry-based instruction and cooperative learning opportunities. In addition, streaming video technology enriches a web-based learning environment. With a reliable Internet connection, this is the students’ preferred format because of the easy access to the streaming video online without exhaustive downloading time. It also paves the path for following online synchronous and asynchronous chatting experiences for students to continue their discussion.

People tend to teach in the way they have been taught (Bennett, 1991). Many preservice teachers begin their professional training with traditional views of teaching in which teaching and learning are seen as telling and remembering facts (Calderhead, 1988). Research has noted that the increased frequency of faculty modelling of technology use contributes to preservice teachers’ increased opportunities with technology-rich, meaningful learning environments (Brush et al, 2003; Persichitte, Tharp & Caffarella, 1997). Some argue that technology has provided education with the tools for needed reforms by engaging learners in personal and socially co-constructed meaning-making and problem-solving learning environments (Bransford et al, 1999; Jonassen, Howland, Moore & Marra, 2003). Therefore, profound change needs to be made in teacher education programmes to meet the demand for teachers prepared to educate learners in the 21st century.

The use of digital video clips, with scaffolding through guided analysis, in the foreign language methods course serves as an example of improved classroom practices. In addition, in the process of technology integration, the modelling of pedagogical strategies helps realise the vision of reform-oriented classroom practice. Dede (1998) suggests that effective integration of new and emerging technologies requires simultaneous innovations in pedagogy, curriculum, assessment, and school organisation.
Successful technology integration does not result from focusing solely on technology issues, but rather from infusing technology into the overall curriculum. Technology alone cannot make a teacher’s transition to constructivist teaching happen. In this case study, it is the instructor’s content expertise that makes the digital video technology a perfect tool to assist her in becoming a more ‘constructivist’ instructor. Because of her content expertise, she can initiate an inquiry-based environment, scaffold, and allow students to have ownership of their knowledge. The vision of technology integration is being realised in the classroom. The change in human behaviour results from the presence of technology, the person’s relationship with technology, and his or her content expertise. Without these components, it would be unlikely that the instructor would change her teaching approach because old equipment does not allow the same flexibility and capability as digital video technologies. She concluded in the interview:

I see that technology was first a tool for me, but it has reshaped my whole thinking now. Before, my thinking was static on how I would teach, and then technology fit in. Now, technology is reshaping how I think and reshaping how I teach. And with this new way of teaching, it’s clearly facilitating. I could not do the things I’m doing now without technology.

Conclusion
The complex relationships among pedagogical beliefs, instructional practices, and the use of technology have shown that using technology as a tool to promote needed reform in education is never easy to achieve. However, it is not an impossible mission. Unless preservice teachers have the opportunity to see the effective use of technology modelled in classrooms, they are likely to graduate with limited professional skills in applying technology to support student work and their teaching. This study exemplifies a needed modelling of technology integration with reformed teaching methods and new pedagogy applicable to teacher education programmes in other content areas.

For technology to have the potential to transform teacher education programmes, we need to address the issue of pedagogy that promotes effective and meaningful use of technology in teacher preparation courses. Technology alone did not bring desired change. It is a learner-centred learning environment that allows technology to become a catalyst for desired change in the teaching practice and learning experience. At the integrative level, the use of technology requires changes in the teacher’s role (Bettes, 1994) and different formats of class structure are expected with the inclusion of a technology component in the curricula. However, as more is learned about technology integration, most people agree that technology itself should not drive decisions and content.

We have learned from this study that the pedagogy goes side by side with the technology. In summary, if we are to see technology as the answer to new and reform-oriented instructional methods in the classroom, we have to be able first to identify the learning goals in a technology-rich classroom. Constructivism provides the ideal framework for the use of technology to engage students in their learning.
References


