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The Application of Information Technology to the Teaching of Performing Arts

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Abstract

Since Grade 1-9 Curriculum enacted with the new course of performing art in the domain of Arts and Humanities, information integrated into teaching has been trendy in this age of information. This paper discusses about how to use information technology to teach performing arts.

For the teaching of performing arts, information technology serves as teachers' assistant tool, teaching materials and students' learning tools. Information technology integrated into the teaching of performing arts roughly contains on-line performance appreciation and cyberstage, co-creation with learning community, distance teaching and on-line learning, computer animation, CAI, and alternate use of audio-visual media and integrated multi-media resource. Information technology is never the whole of teaching and an elixir, thus restrained by factors like human, information literacy, and technical threshold. For these limitations, solutions posed in this paper include—a system for teacher education and certificate, teaching strategies, instructional

resource center, enhancement of Internet bandwidth, caring for the minorities and school community.

Keywords: the teaching of performing arts, information technology, the domain of arts and humanity

Introduction

For a long time, music and art had dominated the art curriculum of civil education. Not until 1999, when Art Education Law was proclaimed, did the art education receive a well-organized plan. Yet performing arts that remained absent in formal curriculum of civil education could only be combined with Mandarin and Society for "Creative Plays" (Chu, Huang, Liao,& Cheng, 1999). In 2000, the Contemporary Guideline of Grade 1-9 Curriculum announced in 2000 enabled performing arts to be involved in formal curriculum of civil education. The teaching of performing arts of civil education, according to Art Education Law, is aimed to develop general art literacy for students and thus includes instruction appreciation in addition to creative plays, children's theaters, and story-telling playhouse.

The definition of technology has been gradually transformed from "media" to "process" (Heinich, Molenda, Russell, & Smaldino, 2002) , hence information technology not only belongs to the software or hardware of computer but its application strategy for teaching will be even more important. Furthermore, Ministry of Education enlarged interior requirements in the Academic Year 1999, setting up computer classrooms in each school, which made information technology prevalent and closely combined with instruction. In recent years, the government has painstakingly promoted the integrated instruction with technology and seed schools for information, and this requires Grade1-9 Curriculum to be mostly combined with the curriculum in arts and humanity domain. For this reason, the application of information technology to the curriculum in arts and humanity domain becomes inevitable. What kind of role does information technology play? How can it go with instructions? How can these problems be solved? These

are all relevant problems about the implementation of information teaching. This paper will further discusses the role that information technology plays in its application to the domain of arts and humanity, patterns of learning, limitations and solutions.

The Role that Information Technology Plays in the Teaching of Performing Arts

After the prosperity of cognitive psychology, the main part of instruction, which had changed from teachers to learners, redefined the roles played by teachers. On the other hand, as the domain of educational technology thrived, the role of media and the definition of technology have been redefined as well (Seels & Richey, 1994). So, for the teaching of performing art currently, what does information technology mean to teachers? The roles that information technology plays during the process of performing art instruction will be elaborated in the following contents.

1. Aids for teaching

As teacher education for musical and visual arts dominates art education of teacher education system of civil education, there is no such system for performing arts (Chang, 2004). Hsui, Chao, and Su (2003) clearly indicated that few contemporary performing arts teachers took professional teacher education course for performing arts. Therefore, adding education for performing arts to current teacher education brooks no delay (Ron, 1999; Liao, 1999). Teachers, who lack professional skills and literacy of performing arts, can make appropriate use of media as teaching aids for demonstration or assistance. Take the instruction of traditional opera for example. Teachers can combine aria instruction in the series of whole-life learning discs *"Let's Sing Taiwanese Opera"* made by National Chung-Cheng Culture Center to show the aria, aesthetical poses and facial expressions, and to enable learners to discriminate those differences between various arias about Taiwanese Opera. The multi-media broadcast room in the series of whole-life learning discs *"Introduction to Chinese Opera"* can be also applied to the assistance for Chinese

Opera appreciation and further comprehension of the differences between each character in appearance, aria, facial expression and movement.

2. Teaching Materials

With the prevalence of computer multi-media and the rapid progress of information technology, a number of teaching materials of arts education have become electronic. Also, gradual development of the Internet leads to continual constructions of performing arts websites that cover extremely abundant teaching materials about performing arts (Chu, 2002). Following are examples such as global art education Website (http://gnae.ntptc.edu.tw/project/dist/dist1/index.htm), in which there are cases introducing the instruction of traditional "Palm Drama" conducted by Cha-giao Primary School, San-hsa Town, Taipei County. The demonstrative instruction of the performing arts website of the humanity arts learning Website in Ministry of Education (http://arts.edu.tw/performance/teach/teach.html) elaborates how to teach performing arts, like "the making of illustration book." The humanity art learning Website, moreover, offers instructional resources concerning creations and instructional sharing for download. In the website of National Institute of Educational Resources and Research (http://192.192.169.108/2d/art/flash.htm), the educational topics area provide with relevant references for the teaching of performing arts and research. And other related teaching materials about the teaching of performing arts, such as dances in Taiwan, modern dance appreciation, children's play appreciation, Taiwanese traditional drama and creative plays, are all accessible in the website of National Taiwan Arts Education Center (http://www.arte.gov.tw/big5/learn/02cd.asp). Lastly, Taiwan Arts Education Website (http://ed.arte.gov.tw/index2.aspx?p1=Design_menu&p2=Design_List1&Id='00001','00002','00003','00004','00005','00006') offers programs concerning the teaching of performing arts units, evaluations, evaluation sheets and teaching materials, all downloadable and ranging from grade 3 of primary school to grade 3 of middle school. Many organizations and institutes have been gradually constructing similar Internet materials, all of which can be considered referential assistance for teaching.

3. Students' Learning Tools

The significance of the stage charm of the theater in a play is beyond doubt (Sutu, Shen, Ko, & Huang, 1990), and nowadays electronic theaters have become trendy (Nie, 2003). For the instruction of play in the domain of arts and humanity, sound effect can be controlled and simulated with the features of computer multi-media, say, the series of whole-life learning discs "Kaleidoscopic Broadcast" made by National Education Broadcasting Station, which simulates the recording studio on air. On the other hand, both the making of flash and the software Creator's Swift Animation Learning render students able to design animation themselves and apply the performance of compute animation to the activities of the teaching of performing arts. Internet, furthermore, is exploitable for the learning and interactions among colleagues during the teaching of performing arts. Email, guest book, BBS, learning community, blog, and Internet phone also offer advanced learning as well as cyberstage appreciation and distance learning. Computer and technology become students' learning tools in previous ways (Kuo, 2003).

The Patterns of Learning of the Application of Information Technology to the Teaching of Performing Arts

Assorted audio-visual effects bridged to the so-far-developed information technology differ totally from the types of the teaching of performing arts. With teachers' guidance, however, the types of information technology and the teaching of performing arts can be complementary to each other to perfect the instruction (Danby, 1997; Marshall, 1998). Therefore, the learning types of the application of information technology to the teaching of performing arts can be roughly divided into: (1) On-line performance and cyberstage appreciation: able to provide teachers with assistant teaching materials; (2) Learning community and co-creation: the former able to provide students with required environments for Internet learning, and the latter for Internet creation of performing arts; (3) Distance teaching and on: line learning: able to provide teachers with synchronous teaching tools; (4) Computer animation performance: able to provide teachers

with required teaching materials;(5) CAI: able to provide students with learning materials for their solitary study; (6) Traditional audio-visual media: able to provide teachers with non-synchronous teaching tools for their teaching; (7) Integrated Technology with Computer and Multi-media: able to combine the previously-mentioned six types that can be conducted in the virtual Internet for teachers' teaching and students' solitary study. The ways to apply information technology to the patterns of learning of performing arts will be discussed as follows:

1. On-line Performance or Cyberstage Appreciation

An inexorable trend led by the current development of Internet is the broadband service that familiarized on-line real time performance and cyberstage, both of which have been more and more respected and promoted because of the two successful events: the "Internet Arts Festival" held by NSYSU in 1998, and "Sleepless Angel City" in Hsin-chu, 1999 (Li, 1999). At present, Council for Cultural Affairs, The Executive Yuan has set up a cyberstage (http://www.cyberstage.com. tw/knowledge/movie/index.asp) Thus for the instruction of performing arts appreciation, students in culturally-disadvantaged districts can watch on-line real time performance and cyberstage instead of being restricted by distance, and even have interactions via video conference with performers.

Tools and assistant teaching materials can be provided in real instruction to carry out this pattern of learning. Abundant resources on the Internet can be exploited for the instruction of: activity 3 "The Play under the Spotlight" of the fourth unit "Open the Treasury" in Kanshuan-published Arts and Humanities textbook, Vol. 7, and activity 2 "Friends from Far Away" of the second unit "Art Communication" in Vol. 8; activity 3 "Insight into Performance" of Nanyi-published textbook, Vol. 7 "Art Kaleidoscope: The Quest of Art"; Activity 3 "Chinese and Western Performing Arts" of the second unit "Art in the East and the West" in Hanlin-published textbook, Vol. 7. These resources contain the cyberstage of Council for Cultural Affairs (with 373 performances gathered overall) or other on-line performance programs that introduce a variety of Chinese and western performing arts, from which students can appreciate diverse forms of performance and understand different characteristics and implications of performing

arts by watching partial or all breathtaking video clips.

2. Learning Community and Co-creation

No performance allows solitary work but requires group collaboration, backstage work in particular. Therefore, cooperation has become one focus of the teaching of performing arts. Today, this age of information renders students unrestricted by locations for their collaboration, which can be conducted with learning community like the BBS, E-mail and Electronic whiteboard (Lin, 2003), or with on-line co-creations on the Internet phone, video conference and guest book. Students can, concretely speaking, present and exchange their afterthoughts and feedbacks in the classes of performing arts appreciation via the learning community on the Internet. The boundless Internet affords more diversified and advanced exploration than traditional group discussion does. In addition, the instruction of the script writing of play and story relay can also be conducted on the Internet as a form of co-creation, which would give more delight and diversity to the activities.

In the instruction of the domain of arts and humanity for the second semester of grade 6, those textbooks, whether published by Nanyi, Kangshuan or Hanlin, all contain units about graduation that include a teaching activity of performing arts, which can go with this pattern of learning to help students create performing arts. It goes without saying those pieces of six-year memories would be embodied in the performance and students are expected to complete the script on their own. Their discussion about script is allowed in classes but will be more appreciated if at breaks or after school. Furthermore, the invitation of alumni and younger schoolmates to join the script discussion via BBS, E-mail, electronic whiteboard, or learning community will make the script still more attractive and influential.

3. Distance Teaching and On-line Learning

The transitions of space and time and the alternation of learning theories cause a change in the definition of education and ways of learning; with the development of the Internet and novel technology, distance teaching and on-line learning have become alternative pattern of learning (Palloff, & Pratt, 2001). Distance teaching can be

divided into synchronous and non-synchronous for the two factors, time and location (Liu, 1998). Non-synchronous distance teaching can meet learners' different needs for time to strengthen their motives. Complete on-line courses for the domain of arts and humanity coupled with proper face-to-face teaching can then qualify few professional performing arts workers or teachers for distance teaching, and other teachers in arts and humanity domain to be coordinators for distance teaching with distance classrooms. In so doing, present-day insufficiency in professional teachers for the teaching of performing arts and chronic difference in development between cities and towns can turn out to be immediately solvable.

Because not each teacher in arts and humanity domain is professional, for instance, the demonstrative instruction of the way to sing "Taiwanese Opera" for the native arts instruction of grade 5 and 6 (the first unit of Kanshuan-published textbook vol. 6, the third unit of Nanyi-published textbook vol 7, the second unit of Hanlin-published textbook vol.5) will embarrass them. This pattern plays a role as instructional tool, one part of performing arts creation that requires a professional teacher in arts and humanity domain with skillful singing ability to be a leader for distance teaching, showing how to sing for pre-videotaped non-synchronous distance teaching or Internet phones (Skype or Microsoft MSN) for synchronous one. Other teachers in that domain serve as coordinators for distance teaching and have collaborative instructions among schools can be relieved from demonstrative singing. With distance teaching, additionally, they can make students practice and correct their aria to intensify their interests in leaning greatly.

4. Computer Animation Performance

Many video performances have been presented with computer animation for the advancement of computer technology. Those movies made by Dream Factory,"*Saving Private Ryan*" and "*The Lord of the Rings*" (Chang, 2002), bridged performing arts and computer animation and heightened children's interests in learning performing arts (Wu, 2002). Thus for the teaching of performing arts of primary and middle schools, teachers can teach students to videotape their performances with DV themselves, process the work with easy computer animation

software Flash or Quick Animator and edit with PowerDirector, Huehsen-Huein, and Windows Movie Maker. Final products presented with VCD will definitely heighten their interests in participation and making.

Teachers can work together to make teaching materials for this pattern of learning in real teaching. The use of DV to photograph students' rehearsals to watch is adopted in activity 2 *"Let's Play the Story"* of the third unit *"Legendary Story"* in Kanshuan-published textbook vol. 3, and activity 3 *"Photograph our Feelings"* of the first unit *"Refreshed Fresh Things"* in Ninyi-published textbook vol. 2. They will have amendment and discussion after watching ahead of the formal performance that can be simultaneously photographed with DV, edited with Windows Movie Maker for subtitling, narrating, and scoring, and finally made into VCD. This not only activates their interests in participation but also can be combined with relevant courses to practice integrated instruction over different domains. Teachers can offer a complete process of activity for the instruction of graduation in grade 6.

5. CAI

Originated in 1960s and introduced to Taiwan in 1976, CAI had not been developed and promoted until 1982 by Ministry of Education and National Science Committee (Lin, 1993). So far there are four types: tutorials, drill & practice, simulation, and game (Chung, 2002). The tutorials, standing on individual teaching model, performs learning of different levels for learners according to their individual differences; the drill & practice relies on mastery learning, aiming at the provision of a series of learning opportunities for learners; the simulation that stems from role play pedagogy takes the advantage of virtual reality where learners can experience the vividness; the last, game, starting from learning motives, is to make learners learn in game and competitions with computers. Regardless of which type applied to performing arts, learners can repeatedly practice and receive immediate feedbacks instead of stress from others, and this benefits their self-correction. CAI, in other words, breaks spatial limitations resulted from their unskilled performance that makes them ashamed of presenting in public. They can practice individually at home to master their skills.

Consequently, this pattern of learning can provide students with an environment for solitary learning. Take activity 3 *"Insight into Performance"* of Nanyi-published textbook, Vol. 7 *"Art Kaleidoscope: The Quest of Art"* which belongs to the integrated instruction of traditional arts, for example. Learners can use tutorials and link the website of humanity and arts in Ministry of Education in accordance with their own needs for different levels and areas. As to the instruction about how to sing traditional opera for activity 3 *"Let's make a play!"* of third unit *"Local Affection"* in Nanyi-published textbook vol. 7, learners can use karaoke machine to practice repeatedly to keep up with the rhythm and tempo and lessen individual difference for the drill & practice type. Moreover, for the simulation about the second unit *"The Magician of Light and Shadow"* in Kanshuan-published textbook vol. 4, learners can manipulate the angles of light and the shadow to familiarize themselves with the variation of light and shadow, and then present. And for the teaching of dance in primary schools, the activity 2 *"The Rhythm of Dance"* of the second unit *"The beauty of Rhythm"* in Kansuan-published textbook vol. 3 offers chances for those less efficient in learning to practice dancing after school through games by using dancing machine that can familiarize them with the tempo and rhythm. They can practice and learn together thereafter.

6. Traditional Audio-Visual Media

Traditional audio-visual media, after long developed, has remained prevalent and dominant due to its simplicity, maturity and stability as well as the promotion of Ministry of Education for audio-visual equipment in around 1991, no matter how technology makes progress. Hence traditional instructional media has still been the priority media used mostly when combined with technology into the instruction by teachers. For this reason, either mass media such as broadcasting and television, or traditional audio-visual media, like tape recorder and portable CD player can be integrated into the appreciation of the teaching of performing arts. Teachers can use traditional instructional media and modern digital media in turn for students' performance (Chou, 2004).

Textbooks whether published by Nanyi, Kanshuan, Hanlin ot Jenlin are all attached with a set of related teaching materials that

contain pictures, musical CDs, VCDs, to facilitate teachers to teach. In this case, this pattern of learning affords teachers assistant materials for teaching. The activity 2 "Animal's Carnival" of the third unit *"Listen to Nature"* in the Hanlin-published textbook vol. 6 is coupled with musical CD and VCD containing animal clips. Students are supposed to observe the actions of animals on those played VCD, followed by the musical CD for them to hear and sense, and to imitate the animals with the melody of the CD. Teachers may thus use the sets of relevant media for teaching materials in turn to activate students' learning motives.

7. Integrated Technology with Computer and Multi-media

As the instructional technology grows so far, integrated technology has been an inevitable trend (Bristor & Kumar, 1999). Centered on computers and integrated with abundant technological media, like laser illumination, Internet, wireless internet, digital audio-visual input and output system, cellular phones, PDA, and information appliances, integrated technology not only enriches but also dramatizes performances. This integration serves as the complement to teachers' insufficiency in teaching and the catalyst to increase in children's interests in learning (Li, 2004). A teacher's teaching of performing arts can be conducted with more abundant and creative tools if integrated with computer and multi-media like DV, computer and the Internet for on-line real-time performance; or with computer, VOD, projector and television for the instruction of appreciation; or with SMS, computer and the internet for co-creation.

This pattern of learning serves as aids for students to create performing arts and contents for the creation of performing arts in related teaching activity: the activity 2 *"Paper Puppet Show"* of the third unit *"Animal's Carnival"* in Kanshuan-published textbook vol. 2, and the activity 6 *"The Rhapsody of Forest"* of the second unit *"Miraculous Creatures"* in the Hanlin-published textbook vol. 3. The teacher can videotape with DV for rehearsal and the reference of formal performance, and use related video output system with computers for the making of masks and props. Then on the performance day, the achievement of performance can reach climax with other computer and multi-media technology like CD player and even, projectors, to decorate the stage.

Limitations of the Application of Information Technology to the Teaching of Performing Arts and the Solutions

Nothing perfect exists in this world; no exception of information technology. As to the teaching process of performing arts, information technology is never an elixir and would occasionally fail to reach some goals. Following discusses the limitations of previous-mentioned types and corresponding measures.

1. Teacher Education and Certificate System of Performing Arts

All teaching is human-based, especially performing arts. Immediate correction and guidance always give more human nature and interactions than the learning with performing skills assisted by information technology, no matter how many times and how long they practice. Even today, artificial intelligence that still fails to take the place of human brains. Teaching belongs to the art, and its complexity can never be outreached by artificial intelligence. Furthermore, the information technology plays only one part instead the whole parts in teaching, unable to replace the role that teachers play during teaching (Li, 2002; Chen, 2001).

For instance, within the patterns like on-line performance appreciation and cyberstage, distance teaching or on-line learning, and CAI, all the interactions, mutual feedbacks between teachers and learners, influences between performers and watchers can never be replaced by the interactions between human and technology, human and computers, and human and hardware. Namely, "human" are still supposed to be leaders on the teaching spot; information technology is nothing but extended material as well as assistant tool for teaching and learning.

Thereupon, for teacher education, an instant establishment of the education and training system of performing arts curriculum is expected for the teachers in the domain of arts and humanity.

2. Positive Establishment and Effective Operation of Instructional Resource Center

Performing arts teachers' different information literacy will have different instructional achievements when using information

technology to teach. As there are more and more resources of information technology of performing arts, how can teachers make valid combination of users, data and the access method (Boehm, 1999) to rapidly apply the resource to the teaching? As the evolution of technology overwhelms human's reaction, how can teachers rapidly learn and use the operation of novel technology: all of these belong to the problems that teachers in the domain of arts and humanity have to face?

I think the swift evolution of technology, gradual complexity of media and a plethora of information often cause teachers' fear of combining information technology into the teaching of performing arts when they use patterns of learning such as the combination of computer animation and photographing equipment, traditional audio-visual media and computer and multi-media. Therefore, the education reform would require the simplification for the complexity of the application of information technology to urge teachers in the domain of arts and humanity to touch information technology to link it to teaching.

Taking domestic scholars' research for reference, we can say that the most feasible solution is to establish and operate instructional resource center positively (Li, 1993; Hsu, 2002; Huang, 2002). A library, audio-visual media, computer technology, and Internet technology can be integrated into the instructional resource center where media and curriculum experts can develop in-service training courses for teachers with information literacy, who is supposed to fully grasp the features of media and integrate every resource.

3.   Cooperation between Government and the Public to Enhance Computer Prevalence

The gradual enlargement of audio-visual data and the considerable increase in Internet users make bandwidth doubtful if it can serve all use modes that performing arts require on the Internet (CrazyFox, 2002). As to the availability of the Internet and computers in every family, and teachers and students' ability and willingness to renew and upgrade relevant technological equipment: these facts often restrain the application of information technology to the teaching of performing arts, and affect learners' willingness greatly.

The possession of computers that are accessible to the internet

and the speed influence how well learners can do a lot when they watch on-line performance and cyberstage, do co-creation with learning community, use distance teaching, on-line learning and apply CAI. Lack of tools will make these patterns of learning unworkable.

Therefore, the government must accelerate the setting of domestic basic Internet. The extreme advances in the speed of Internet transfer will be around the corner if the government works with institutes by using state-of-the-art technology and materials to improve the bandwidth. Concerning the recycling of used computers conducted by the government, the renewal of those in institutes, organizations and schools, distributions of used computers to homes of the minorities, along with open computer classrooms in the community centered on schools for advanced promotion of information education to the community residents, these are all the first step taken to popularize computers.

Conclusion

It has been merely three years after performing arts was adopted and involved in the formal curriculum of civil education. Arts education-caring people all bend every energy toward reaching the goals that the teaching of performing arts can be developed steadily by exploiting current resources to comprehend and broaden the advantages of information technology along with the utilization of instructional strategies. Teachers, therefore, have to make efficient use of information technology, a new assistant teaching tool, and meantime combine this newly teaching material for the extension of teaching activities of performing arts. And learners are required to get familiar enough with this new learning tool to present their performance efficiently.

The present-day implementation of the application of information technology to the teaching of performing arts roughly contains on-line performance appreciation, cyberstage, co-creation with learning community, distance teaching and on-line learning, computer animation, CAI, and alternate use of audio-visual media and integrated media resource. For either, information technology is never the elixir for teaching, which is human-based. After all, it ought to be "people

in charge of technology" instead of "technology in charge of people." Consequently, one problem concerning the application of information technology to the teaching of performing arts lies in the expertise of teachers. The integration strategy of instructional resources would influence how information technology gets integrated into the teaching of performing arts, while the technical threshold serves as the main reason that requires information technology to be integrated into the teaching of performing arts. As to teacher education and certificate system, teaching strategies, instructional resource center, NII, caring about disadvantaged minorities, and, school community, these can lessen the limitation of information technology when applied to the teaching of performing arts.

Teaching combined with information technology, in this information society, is an inevitable trend. We hereby suggest that Ministry of Education and related organizations set up instructional resource center as soon as possible and sort CAI and teaching media for teachers to use on the spot. Second, a well-organized system for teachers to take in-service training courses is expected to enhance their information literacy, which can be combined into their teaching. One more thing, performing arts teacher is supposed to change their mindset. That is, information technology integrated into the teaching of performing arts will be an inescapable problem that each teacher should face. Besides, different CAI and information technology have to correspond with different teaching design and strategies for more gorgeous achievement in the teaching of performing arts. For instance, learning software of tutorials can go with group discussion or mutual teaching; that of the drill & practice can be coupled with group competition strategy; that of the simulation can go with group collaboration; that of the game can go with the whole class competition strategy; groups can mutually grade each other for on-line watching area.

In conclusion, relevant resources about digital learning of performing arts will become more and more, and information technology will become more and more prevalent as well. The key to the success of information technology still lies in teachers' attitude and the design and application of the strategy: If their attitudes are open and free or not, and if the design and application of that is proper or

not. If teachers can steer towards a correct direction and repeatedly try every strategy, the achievement of the application of information technology to the teaching of performing arts will make progress.

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