A Study on the Direction of Education

To Prevent Multimedia Illiteracy in the Digital Multimedia Environment of the 21st century.

Authors:
- **Yoon, Jeong Shick**, Department of Industrial Design Engineering, Korea University of Technology and Education (jsyoon@kut.ac.kr)
- **Hong, Seong Soo**, Department of Industrial Design Engineering, Korea Polytechnic University (hss@kpu.ac.kr)

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Abstract

The 21st century is the era of digital multimedia. The popularization of personal computers (PCs), the development of software and the building up of networks have led to the establishment of the multimedia environment and caused qualitative changes to information flow.

As it is not restricted by time and space, the development of multimedia technology has facilitated direct contacts with customers and made processing and applications of content easy, thereby accelerating the social diffusion of multimedia content.

Due to the rapid growth of the digital multimedia industry, many have not been able to cope and remain illiterate. But thanks to the emergence of personal media such as blogging, mini homepages and UCCs (User Created Contents), most people can produce multimedia content on their own. With the ever increasing demand and development of the digital age, both experts and laymen are challenged to be skillful in using multimedia.

In conclusion, to keep up with the public's wide acceptance of the multimedia industry, elementary, middle and high school students should be educated on how to use multimedia tools besides basic computer skills such as word processing. And, re-education of the older generation is also needed.

Adobe

Keyword
Digital multimedia, multimedia illiteracy, direction of multimedia education

1. INTRODUCTION

1.1 Background and Objective

" And because of the rapid proliferation of digital content, the multimedia environment has transformed people from receivers of media to producers."

The 21st century regards knowledge as the core factor that determines the competitiveness of individuals, industries and the entire nation. The knowledge-information society regards human resource, the very producer and user of knowledge, as very important. The popularization of personal computers (PCs), the development of software and the building up of computer networks have contributed to effective communication among their users, as well as helped bring qualitative changes in the flow of information by establishing the multimedia environment and by serving as platform to propagate multimedia.

The development and quantitative growth of internet multimedia, the networking of systems, facilitated quick, direct contacts with internet users – as the World Wide Web is not restricted by time and space. It also enabled free processing and applications of contents, thereby accelerating social diffusion of digital multimedia content. And because of the rapid proliferation of digital contents, the multimedia environment has transformed people from receivers of media to producers.

This study looks into the necessity of multimedia education in the digital multimedia environment. It also presents the educational direction required to raise experts in multimedia as well as provides advice on how to narrow the gap of information by propagating the use of multimedia among students.

1.2 Methods and Scope of This Study

This study aims to look at the concept and development of multimedia; emergence of multimedia illiteracy and the need for education, and the necessity of a multimedia educational strategy.

This paper attempts the following: First, to understand the multimedia environment and multimedia illiteracy, by looking at the concept, content and development of multimedia. Second, the study aims to explain the emergence of multimedia illiteracy and the need for education, by looking into the characteristics of personal media and how the multimedia content industry developed. Third, the study aims to propose the direction of education that could prevent the general public from becoming multimedia illiterates, by looking at current trends and cases in multimedia education.

2. MULTIMEDIA AND CONTENTS

2.1 The Concept and Characteristics of Multimedia

The term "multimedia," which consists of "multi" – which means integrating many expression methods – and "media" – which implies technical key words such as "computer," "dialogue," and "digital," has changed its meaning through the decades. At first, it meant "using two or more independent media in parallel for one purpose".

There are many definitions of multimedia. First, it means a multiple media that expresses information by integrating many media such as text, numbers, images, and audio-visual materials. Second, it means "the converging of various information, such as text, sounds, images and animations in a single digitized form". Third, it means "a new way of conveying information that is adopted for computer communication or cable broadcasting". Fourth it means "a system that enables an easy and rapid use of huge amounts of information".

Based on these, the term multimedia could therefore be defined as a platform that integrates analogue information in various forms such as text, images, and audio-visual materials to a single digitized data and relays them using several (multi) vehicles (media). It is a system that allows users the use of easy and high-speed information communication networks.

Like this, multimedia can be defined in many different ways. For a platform to qualify as truly "multimedia", however, the following three conditions should be met. First, two or more media should be used at the same time so that various information can be transmitted simultaneously. This means, when one medium is being used, the other one should also be functioning. Second, for one system to express various media, various equipments should be used in an integrated way unlike during the analogue era when each medium existed independently from any other media. As information becomes digitized, all media can now be integrated into one and all the necessary multimedia equipments may be controlled by just one computer system. Third, users should be able to communicate with the system. Various media are integrated into one system so that users can engage in a dialogue by using information.

2.2 Multimedia Content

Multimedia content are digitized information that are produced, circulated, and consumed through computer information bits, or through the information network or the broadcasting network. Computer graphics (CG), virtual reality (VR), digital sources, cyber characters, online games, digital images, digital animation, online education content and digital books are examples of multimedia content. The multimedia content industry means the industry that develops, produces, circulates or sells multimedia content as mentioned above. UCCs (User Created Contents) that are recently gaining popularity are also considered as a multimedia content.

Table 1 : Classification and Definition of Multimedia Content [1]

Classification		Definition
Education content	Solely for educational purposes	Two-way learning program consisting of images, sounds, graphics and text
	For edutainment purposes	Education content mixed with game elements
Multimedia publishing	Digital books	Content to deliver knowledge, such as encyclopedia, dictionaries of specialized subjects and digital books that are used in the multimedia devices such as PC
	Web products and digital publishing	Regularly or irregularly published contents such as web products, digital newspapers, online magazines and image novels
Games	Arcade games	Games for game-selling shops that use printed circuit board (PCB) or a separate exclusive hardware
	Video games	Games using TV monitors or exclusive devices
	PC games	PC-based games (including online games)
Digital images	Specially edited images	Specially edited images and computer graphic works to be used for broadcasting, movies and advertising
	Digital animation and cartoons	Animation and cartoons that use computer graphics
	Digital characters	2- and 3-dimensional shape models that are digitized for commercial purposes and personality elements model
Tools to produce multimedia contents		Application software used for production of contents
Others		Items other than abovementioned, such as simple CG works, development of sound effects and treating of data and images,

Notes:

[1] Namyoung Koh: Guide in the Era of Information Society, Kicheon Research Center, 246 (2004)

While existing content can appear as a single medium, multimedia content are made by using and integrating various forms of media in order to create the desired end results. Unlike the existing content, multimedia content can be interrelated between users and the end results. Besides, because multimedia content are computer-based, their data must be digitized and because the data are relayed through media, they are less restricted by time and space.

Table 2 : Comparison between Existing Contents and Multimedia Contents [2]

Existing Content	Multimedia Content
Content provided in traditional media such as books, newspapers, radio, TV and movies	Content that have been re-created by using total media
Analogue	Digital
Served one-way	Served two-way
Clear distinction between the content providers and the users	Content users can be the content providers at the same time
Restricted by time and space	Relatively hardly restricted by time and space
High cost to correct content	Easy correction of contents and low cost
Information gained in a sequenced way	Information gained in a non-sequenced way

3. MULTIMEDIA ILLITERACY AND THE NEED FOR EDUCATION

3.1 Multimedia Illiteracy

After twenty years since computers were fully introduced in the 5th Training Course in the late '80's, modern computers have become so universal that they are now used not only in schools but in every part of society. The Internet has accelerated the usage and popularity of computers. Today, it has become necessary for people to learn how to use a computer and to access information from the World Wide Web. There are now even terms such as computer illiteracy or internet illiteracy. With the emergence of digital multimedia, not only computers but also many digital devices have become popular and the production and use of multimedia information are gradually becoming as important. The ability and know-how in digital multimedia have also become essential.

Computer illiteracy is the concept opposed to computer literacy. Computer literacy means the general understanding of how a computer works. This includes the knowledge on central processing units (CPUs), and operation rules. It also includes more than familiarity with computers, such as the ability to use and operate word processors, spreadsheets, database and other software tools. Computer illiteracy therefore, applies to people who do not possess these understanding and abilities.

Likewise, network illiteracy is the concept opposed to network literacy. Network literacy in general includes the ability to use overall essential internet functions such as e-mails, news groups, and Listserve. To have this literacy, students should know how to use web browsers as the interface between the users and the internet. Network illiteracy refers to people who do not possess such abilities.

Browsers allow users to process an interface that can conveniently be used. Network literacy includes knowledge of their functions such as the book mark function and channel function, as well as the skill to effectively search, surf and access information from the World Wide Web. To surf the Web effectively, users have to rely on their critical and analytical skills. Asking the right questions, moving to the right pages, changing the flow of information, following references of documents and choosing and applying the right search engines are also indications of network literacy. Information searching is an important skill that requires the integrated use of search engines, directories, individual connecting pages and connection of hypertext[3].

Notes:

[2] Sangho Moon: Multimedia Technology, Grobal, 137(2007)

[3] Heesoo Lee, Sookhee Kang: A Study on the Change of the Concept, Computer Literacy as a Life-long Learning Ability, ADRAGOGY TODAY, Vol. 3, Issue 2, 2000

Multimedia illiteracy is the concept opposed to multimedia literacy. Multimedia literacy is related to helping users develop the critical understanding of the nature of multimedia, techniques in multimedia and the impact of such techniques. Multimedia literacy aims to increase students' understanding on how media work, how they produce meaning, and how they are organized and made up in reality. It also aims to provide students with the ability to produce media outcomes. For one to be literate in multimedia, basic computer literacy is necessary because multimedia information flow through the computer. Visual literacy and media literacy, which are not covered in traditional education, are also necessary to achieve multimedia literacy.

Hence, multimedia illiteracy refers to people who do not have the ability to produce, use and accept multimedia content. Today, multimedia content are widely expanded in the society externally and the era of personal media is ever emerging internally and hence, everybody can produce multimedia content. Such illiterates should study to acquire the necessary abilities so that they won't fall behind.

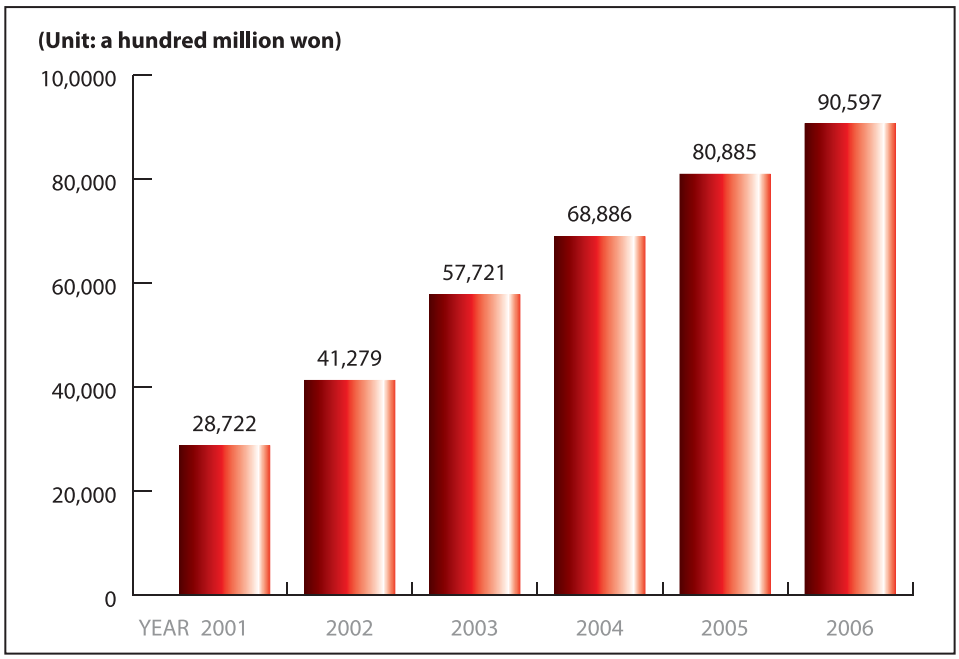
3.2 The Prospect of The Digital Content Industry

Digital content, literally, is content – information and cultural works – that have been digitized from their analogue form. More concretely, digital content means, first, the expression of text, sounds, still screens, animations and the combination of these to acquire information or to use them for emotional use. Second, they refer to products that are circulated via digital media or networks, either produced digitally or with analog expressions that are encoded digitally.

The term "digital content" has a very similar meaning as the "multimedia content" in this study. Most digital content is identical to digital multimedia content, and therefore they can be used as synonyms. The digital content industry is an amalgamation of other traditional industries and therefore is not a new industry. Industries that did not originally have digital content began to invest in digitization as their techniques developed and become universally used. They realized that the source of their competitive edge lies in using digital contents. The publishing, print and movie industries are rapidly digitized and all their content is expected to be transformed into digital content.

The Korean digital content industry has recorded annual average growth of 25.8%. The recorded revenue of 28,722 billion won in 2001 was expected to reach 95,970 billion won in 2006. In reality, however, it grew by 12.0% amounting to 88,850 billion won in 2005, with growth speed that slowed down as compared to the past. Still, in terms of actual amount, it marked a growth that was more than 1 trillion won. The revenue exceeded 9 trillion won and the 10-trillion market is just ahead.

◈ Table 3 : Korean Digital Content Revenue (Total)



" The development and growing popularity of digital content, such as UCCs, would require any individual to acquire at least a basic understanding or perhaps even above a certain level of ability in the production of multimedia content."

Considering the future prospects of this industry, the Korean digital content industry is estimated to maintain stable growth of around 10% until 2011, although there is seeming difficulty to grow drastically. In 2007, there were many favorable developments such as the commercialization of Internet Protocol Television (IPTV), wibro, and the expansion of communication services like High-Speed Downlink Packet Access (HSDPA).

Also, as the trend of convergence becomes more visible, more contents and services are expected to converge and thereby activate the market. Market participants also play an important role. Their efforts to further change and improve the market environment brighten the future market prospective. Taking all these into consideration, the Korean digital content market will seem to surpass 10 trillion won in 2007 and grow to 15 trillion won in 2011[4].

Other important factors in forecasting the prospect of the digital content industry include the popularity of UCCs and the scaling up of the digital content industry to a conglomerate level. Korean conglomerates such as SK Telecom (SKT), Korea Telecom (KT) and CJ, leaders of the cable and cable-less communication businesses, have been entering the digital content market for a long time.

Also, big conglomerates such as Samsung Electronics and Daesung Group are strengthening their positions as well. Recently, Google also entered the Korean market as it established its research and development center in the country. Big companies are now trying to enter the domestic and overseas markets. The scaling up of content companies and a market environment that is increasingly favored by conglomerates will encourage more investments and lead to produce higher quality content and make the Korean digital contents industry more competitive internationally.

The popularity of UCCs emerges as one of the critical issues in the content industry. In 2006, the user-participating services called Web 2.0 expanded in the form of UCC, which includes animation. This expansion is considered as one of the most meaningful changes that year. Since 2000, Naver launched the user-participating service called "the knowledge Search" (Knowledgein) and in 2003 it expanded radically and eventually dominated the search engine market.

Two outstanding Web 2.0 services are the human network service and photo uploading service of Cyworld. In 2006 as Web 2.0 services expanded into animated UCCs, Daum integrated the existing animation services such as TV pot and Pie and provided them as "Daum TV". This ranked very highly in the number of UVs (unique visitors) to the animated services portal. Also, it was recorded that more than a million people visited Pandora TV daily, which triggered the UCC-animation boom in Korea.

Yahoo, Freechal, Damoim and UMC are also providing animated UCC services. Cable-less communication companies as SKT and KTF have begun providing cable and cable-less UCC animation services by teaming up with animation service providers. Hanaro Telecom has also teamed up with animation-specialized sites through Hana TV, its own IPTV service.

Based on these developments, as the animation service providers enjoy rapid growth, new attempts are being made to improve circulation. As UCCs get more attention from the public, more new sites have appeared where UCCs can be traded. A good example of this is Pickscout's "Multimedia Knowledge Marketplace," which used to be the "Animated UCC Marketplace". This was a meaningful attempt because it forms a new UCC content market and opens up the potential to expand the existing content trade into trade between users.

The digital content industry has indeed grown and continues to grow. Widespread use and production has greatly improved the people's ability to collect and use information. The development and growing popularity of digital content, such as UCCs, would require any individual to acquire at least a basic understanding or perhaps even above a certain level of ability in the production of multimedia content.

For professionals, such abilities will become indispensable. Therefore, the production and use of multimedia has to be taught at the elementary, middle and high schools. Education of the new generation should be stressed. Even professionals will need more professional and sub-classified education.

Notes:

[4] Korea Software Promotion Center: Market research report on the Korean digital contents industry in 2006 and 2007

3.3 Emergence of The Era of Web 2.0 and The Personal Media

The development of various image media, the Internet and multimedia accelerate the emergence of a new generation who are more used to these services. In the Web 2.0 service environment, providers are actively encouraging users to participate in and share the services. In Korea, even before Web 2.0, the use of next generation web services such as mini homepage, blog sites and knowledge search that are based on users' participation were already prevalent. Service of "the knowledgeable" by Naver and image blog or image care of Daum continue to develop services that persuade the users to voluntarily participate and secure a great amount of content.

As users more and more participate in the digital environment, more services like these will open up and be shared thereby transforming the Internet society and activating personal media. This has a great impact on the media industry. Not just a name to call specific sets of techniques, Web 2.0 has now become an open service where internet users openly and readily participate and share[5].

Table 4 : Characteristics of The Personal Media Revolution [6]

Classification	The 6th information revolution (information highway revolution)	The 7th information revolution (personal media revolution)
Core values	- productivity - efficiency - globalization - working 9 to 5, work places, social position - imitation-ism	- satisfaction - personal activity - individualization - 5 to 9 - I and the family - me-ism
Relation between users and the media	- one vs. all - one vs. many - one way - large production of limited items	- one vs. one - many vs. many - two way - small production of many items
Power shift	- dispersion of power	- expansion of consumer sovereignty
Roles of the public	- a producer as a consumer	- a consumer as a producer (pro-sumer)
Infrastructure	- mainly fragmented information infrastructure and cabled terminal	- mainly integrated infrastructure and integrated terminals
Core media	- traditional mass media such as TV, radio, magazines and books - digital mass media such as internet sites, digital TV and digital radios	- Individualized digital media such as HDTV, two way TV, mobile phone, mobile broadcasting, blogging, and portable multimedia devices

The development of personal media can be attributed to the following. First, the Internet population and the development of media technology have grown tremendously, thanks to information communication technology. As existing media converge and integrate, and as functions are integrated to one specific media, new forms of media emerge. Plus, since all the media can be digitized, the digitized multimedia content can now be shared in one specific arena, the Internet, unrestricted by time and space.

Second, the development of digital-based hardware and software that can create media content on their own, has also aided the development of personal media. Digital hardware items such as digital cameras, digital camcorders and MP3 scanners are now easily produced and have become very accessible and popular. On the other hand, multimedia software, content and programs have been digitally improved and propagated so that users can use them – and change, process, edit and publish – even more easily. More and more users can now express and produce their needs and ideas through the digital media.

Notes:

[5] Eungjae Lee: The Era of Personal Media Opened with Web 2.0, regional information, 21-22 (2006)

[6] Daewon Hyun: Personal Media, 2006

Third, many new ways and means are made available to share digital media contents. Thanks to the popularity of personal homepages, blog sites and social communities, such content is easily uploaded and shared on the Internet. Various digital devices such as mobile phones may now be converged and can move data digitally to computers and the internet. Through this trend that is rapidly gaining popularity, users can now easily produce personal content and access so much information.

Fourth, there is now an increased demand of individuals who can produce and use digital content on their own. Despite the fact that media technology is well developed and that digital cameras and video cameras have propagated the market, the digital content industry will not flourish without motivated people pushing the boundaries. With the expanded individualism, the need to find and express one's self identity and the need to be recognized by other people greatly motivate individuals to produce and use personal media items.

Popular and effective examples of personal media are UCCs and mini homepages. One tends to associate the UCCs just with animation. Yet, UCCs, in a broader sense, can include written commentaries reflecting individual opinions, story writing in community sites and blog sites, editorial cartoons drawn by users directly on the web, flash animations and integrated or edited photos.

To produce UCCs, users outline their ideas and take photos of images through which they could express their ideas. And, to express their ideas through multimedia channels such as writings and images on the web, they use multimedia tools. The representative example is Adobe Photoshop, a software which can be used to edit or merge images. This way, users make use of their multimedia knowledge and skills to produce creative and meaningful contents.

Since the production of personal media and digital technologies have become generalized as a result of the popularity of digital devices, one should be able to use personal media and accept multimedia content from other users in order not to lag behind. As personal media devices become more sophisticated, it becomes more important to be able to structure and operate with various information and content. Therefore, a generalized multimedia education is indeed a necessary educational program for this generation.

3.4 The widening gap of information

" As personal media devices become more sophisticated, it becomes more important to be able to structure and operate with various information and content. Therefore, a generalized multimedia education is indeed a necessary educational program for this generation."

Modern information society provides enormous benefits to society that were not available before, such as the availability of inexhaustible information, quick transmission of information, effective ways of changing data, cheap and easy access to information, and the creation of new living standards. At the same time however, the information society also poses a lot of societal problems such as the loss of existential values, compromised privacy due to stricter monitoring, ambivalent coexistence of too much or too little information, concentration of power due to the emergence of technological bureaucrats and excessive urbanization. These problems create a wide information gap, referred to as the gap between those who have access to the new information media and those who do not have.

The information gap can be divided into three types. Type 1 gap is determined by the accessibility of information; type 2 gap by the usage of information and type 3 by the reception of information. The first type can be called the Gap of Opportunities. Opportunities to access media or data are either high or low depending on one's social and financial status. The poor often always are computer "illiterate." The second type is about the Gap of Usage. Information is determined according to how widely information is used, whether "highly or lowly."

While the upper group of users in Type 1 is called "skillful producers," the beneficiaries in Type 2 are the "skillful users." They are mindful of not only the breadth of knowledge but also the depth of knowledge. The third type could be called the Gap of Culture. The influence of culture is enormous because the depth of knowledge is more important than both the quantity and width of knowledge. Therefore, people who are considered as "computer illiterates" or "net illiterates" may also be referred to as "culture illiterates." Effective information users are then considered as the main drivers of society, "mature netizens" who have the "heart" in addition to the "hands" and "brain."

◇ Table 5 : Characteristics Per Type in The Gap of Information [7]

	Type 1	Type 2	Type 3
Nature of the gap	Gap in opportunities	Gap in use	Gap in acceptance
Elements of the gap	Access to information	Use of information	Enjoyment of information
Major resources	Economical capital	Social capital	Cultural capital
Level of knowledge	Quantity of knowledge	Width of knowledge	Depth of knowledge
Major type of knowledge	Simple knowledge	Practical knowledge	Cultural knowledge
Characteristics of the weak class	Computer-illiterate	Net-illiterate	Culture-illiterate
Profiles of information users	Skillful operators	Skillful users	Mature netizen
Learning methods	Learning by training	Learning by experience	Learning by insights
Major improvement area	Hardware	software	Human-ware

It is necessary to pay attention to the gap Type 3. To become a "mature netizen" as in Type 3, one should first be "skillful operators" as in Type 1 and "skillful users" as in Type 2. In order not to be culture "illiterate" as in Type 3, one has to enjoy the new cultural resources not only by using information as skillful users as in Type 2 but also by expressing one's opinions effectively and sharing one's own unique contents. That is, if one knows how to use and accept not only the Internet but also the various forms of multimedia in Type 2, then one can have an easier access to cultural values as the beneficiary in Type 3.

4. THE EDUCATIONAL DIRECTION REQUIRED FOR MULTIMEDIA

4.1 Cases of Multimedia Education

4.2. The Educational Direction Depending on The Multimedia Environment

As the digital multimedia content industry continues to grow and multimedia becomes more and more popular and accessible in our daily lives, individuals must develop abilities and skills in multimedia, and for the designing professionals, such abilities become essential as well. Education in multimedia and digital culture must be strengthened and provided to everyone in order to not only develop experts in the filed but also to produce mature netizens who can enjoy the cultural values of the era of personal media.

Multimedia education may be enforced observing the following directions. First, it must be taught at the elementary, middle and high school levels. The use of multimedia is now essential for everyone, much more for design professionals. And if information education becomes accepted as the initial nationwide education, then the country would need to upgrade multimedia education. In the future, as personal media becomes more active, communication skills also become more and more important. Individuals must be able to use various media, structures and information content. Therefore, multimedia education will be used as an essential learning program and serve to develop experts.

Notes:

[7] Chongkil Kim, Mooncho Kim: Understanding of Digitalized Korean Society, Chipmoondang, 275-283 (2006)

Second, it is necessary to designate an organization that can run the multimedia education programs to re-educate the existing generation as systematically as how the national information education program is being handled. Opportunities should be provided so that various multimedia educational programs become accessible to learners as they participate in media production classes according to their preference.

Third, knowledge about multimedia both for the receivers and producers should be integrated and taught. This way, learners could play an expanded role of pro-sumers, or 'producer-consumers. They should be provided with opportunities to understand and express communication principles using various signal systems, critically understand various media and creatively produce digital images. Doing so can foster a unique societal culture overall. Multimedia education should be both sharing and correcting such experiences.

Fourth, multimedia education should actively include the methods of using different software applications and programs. Each individual form of media uses a unique signaling system and to express such systems, one must be able to use the most fit multimedia production tools.

5. CONCLUSIONS

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www.adobe.com

Adobe

Adobe Systems Pte Ltd
8 Temasek Boulevard
#06-02 Suntec Tower Three
Singapore 038988
www.adobe.com/ap