

主題：新たなメディアの可能性を拓く次世代デジタルコンテンツの教育的役割

副題：日本の強みマルチメディア・リテラシー遊び”の社会技術の多様性の考察

Main subject: Educational roles of the next generation digital contents that pioneer possibilities of new media

Secondary subject: Examination into the diversity of social technology of Japanese strong point multimedia literacy “Asobi”

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科学技術に大きく依存したデジタル・ライフの中では、エンターテインメント領域を中心にビデオゲームやコンピュータゲームは、その面白さゆえに人間の社会生活における“遊び”の側面を支配している。新しい価値の創出に向け多様なメディアのあり方を、多くの専門家から聞き取り調査し、2011年度から施行される第4期科学技術基本計画に取り込む課題を異なる視点から考察してきた。その過程で、情報とコミュニケーションに関する新技術の遍在かつ普及したお陰で、これまで科学技術政策とはあまり縁がないと考えられてきた文化及び芸術といった領域が、社会技術として確立したゲームなど、「遊び」の中から新たなメディアの可能性を拓く、次世代デジタルコンテンツの多様な教育的役割についてハイライトする。

In a digital life that is largely dependent on science technology mainly for entertainment area, video game and computer game dominate the play aspect of people's social life because of their fun feature. We have delivered from different viewpoints about the diversity of media to create a new value as the challenge to tackle the forth science and technology basic plan which is scheduled to put into effect in 2011 fiscal year conducting fact-finding on the spot from many experts. In the process, the culture and art area, which has been considered ever less related with science and technology, thanks to the ubiquity and prevalence of new technology concerning information and communication, have pioneered new media possibilities among games and play that has established as social technology. We highlight the diverse educational roles of the next generation digital contents.

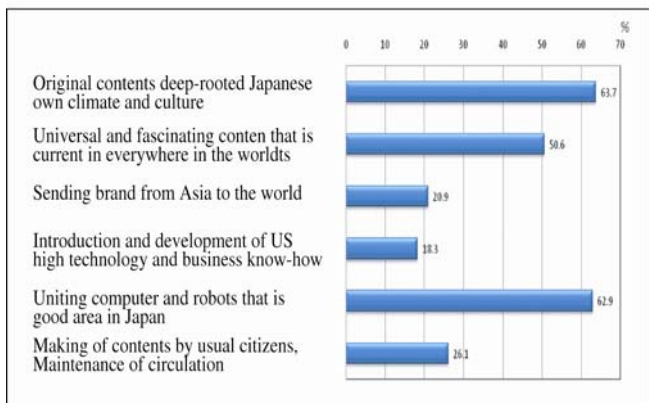
1. SUMMARY “Search for New Study Area”

Marshall McLuhan, a famous media debater in 60’s, his witty word “media is message.” is well known. He has undergone telephones, radios, and describes about social cultural effect that electronic media has today in “Media theory”, using different expression in the time which television was popularized finally in ordinary family. The following is the words. “It is nothing less than to say that individual and social effect caused by any media is a result of new criterion that expansion of ourselves or new technology introduce among us.” That is to say, people make tools and new criteria introduced by tools change people. Although it is the age that everyone can imagine the internet unites with the television and networked multimedia prevail each household, the message which McLuhan predicted still sounds fresh. Undoubtedly, the age has evolved as it was expected. We open up a vista of what contents we will receive hereafter from multimedia and a new research area and an important policy that our country will tackle.

1-2. DEVELOPMENT OF NEW RESEARCH AREA

Although Japan secure its position all its own in digital contents and media art area, it is pointed out that catching up of Asian countries and weakness of technology base and it is necessary to proclaim a new direction of research and development from the global and medium long term viewpoint. Basically, there are two approaches which are ①not only maintaining Japanese strength but also intensifying and developing it ②and exploring a new area.

According to the survey conducted by the author’s joint research with the cooperation of The Institute for Future Technology, “The development of original contents deep-rooted Japanese own climate and culture” and “The combination of computer and good field in Japan like one-making or robots, etc” are given to the high rank as strategic field for Japanese media art and digital contents industry to survive.(Fig1-1)



(Fig1-1) Strategic important fields for Japan to survive

(Plural answers: 2007 survey by The Institute for Future)
Technology every one of these two is important point to exercise

Japanese strength. Furthermore, as state of art technology and new technology for development of digital contents, items like Table1-1 are showed. That is along with high performance oriented basic technology like super-thin display technology, high-speed image processing engine, the next generation record media of ultrahigh capacity, “robots technology” “human sensibility, feeling analysis software” “ five senses technology except image ”, moreover “cognitive science, behavioral science” new science and technology area.

(Table1-1) The 29 field of technology for Japanese “Strong Point” outstanding performance in technology for daily lives and home information appliances (in red), quoted from “Future Science and Technology in Japan toward the Year 2035 ” National Institute of Science and Technology Policy

Category	Filed	Japan	America	EU	Asia
Electronics	Car Electronics	84.5	14.9	0.6	0.0
	Energy transformation / Strage device	76.5	23.2	0.3	0.0
	Digital home electric appliances	74.7	25.1	0.2	0.0
	Display	74.5	24.5	0.9	0.2
	Network electronics	57.9	41.8	0.0	0.0
	Opt&Photonicdevice	56.3	41.8	1.7	0.0
Agriculture,Forestry&Fishing	ecological manufacturing technology	50.8	34.6	14.6	0.0
Frontier	space/ocean/earch technology of safe&secure	65.4	31.3	3.0	0.0
Energy&resource	reuse of resource	88.0	3.0	8.6	0.0
	distributed energy system	62.4	33.9	2.8	0.0
	more efficient transformation&use of energy	60.2	38.1	1.4	0.0
	hydrogen energy system	51.2	25.8	21.1	0.0
Environment	economical recycle of utile resource	59.8	34.7	5.2	0.0
Nano-tech&material	technology of environment and energy	86.2	12.6	1.0	0.2
	technology of manufacturing,molding with nano-tech	63.4	36.0	0.6	0.0
	new material structure control with nano-tech	59.6	39.4	0.8	0.0
	technology of subsatance creation/synthesis/process	51.1	47.6	1.2	0.0
Manufacturing	technology of surface reforming&interface control	87.6	8.6	3.8	0.0
	high manufacturing technology for social infrastructure	73.2	24.6	2.2	0.0
	human/robot for production	52.1	40.0	7.8	0.0
Industrial infrastructure	productive service industry & service sector	59.5	38.4	0.7	0.0
Social infrastructure	technology for disaster prevention	80.7	18.8	0.3	0.0
	ecological and efficient system of distribution	75.9	3.6	19.6	0.0
	improvement of constructional performance	71.6	15.2	12.6	0.0
	environmental measure of transportation	60.5	22.8	16.5	0.0
	technology for traffic safety	60.4	35.0	3.9	0.7
	recycle/maintenance/management of social infra	60.3	18.1	21.6	0.0
Social technology	technology for play	69.4	23.3	6.2	0.4
	inheritance and maintenance of culture & technology	64.2	24.0	11.8	0.0

In the general conference on science and technology “the creation of contents sharing impression with the world and information application technology” is presented as strategic important science and technology in telecommunication area (March 2006).

Specifically, among three challenges “the creative talent’s promotion” “enhancement of infrastructure sharing impression” and “ huge integration of information and the use ”, in all 16 technological subjects are taken up.

These research assignments taken up overlap the next generation digital contents dealt in the thesis or assignments to promote the next generation media art On the basis of the following five approached are thought as directionality of concrete study in our country in future.

- ①The pursuit of future reality: Technology realizing large screen, stereoscopic vision, super-high-speed transmission network, and Super ultra high density image.
- ②Research and development of hybrid type contents that aim at escape computer: the uniting one-making technology and robots

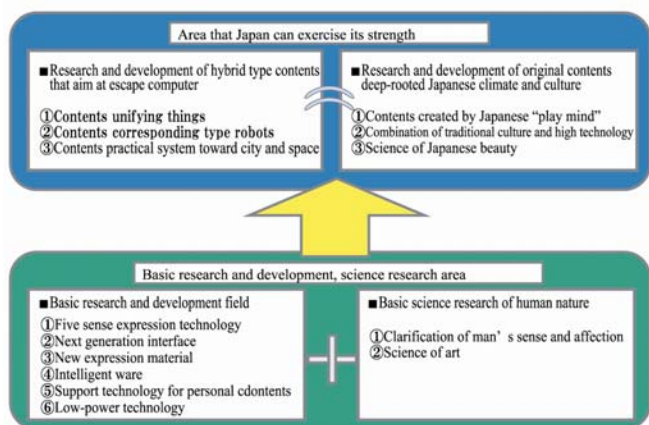
technology with contents that is good area in Japan.

③ Research and development of contents deep-rooted Japanese own climate and culture: the development of contents deep-rooted Japanese own culture and climate moreover on the basis of common outlook on the world and expression technique in Asia.

④ Research and development of basic and common technology: development of contents and media art concerning to five senses (especially sense of smell and so on) and sensibility and development of new materials that make it possible to express new art.

⑤ Relating science research area: science and technology for “clarification of man's senses and affection” by cognitive science and brain science, “art science” by mathematical principle attainments, life sciences, and nonlinear mathematics.

In this chapter from above mentioned ②~⑤ we organized a new area that was requested for the next generation digital contents and the promotion of new age media as it is referred to Fig1-2.



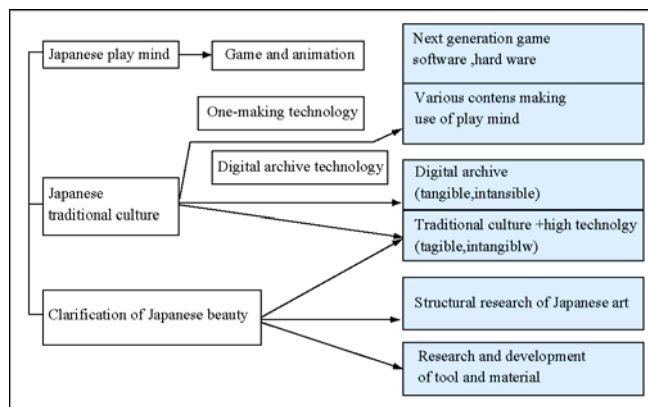
(Fig1-2) Areas and fields of research to tackle intensively

That is there are two areas and four fields as follows.

- 1) The area that can exercise Japanese strength
 - ① Research and development of hybrid type contents that aim at escape computer
 - ② Research and Development original contents deep-rooted Japanese climate and culture
- 2) Basic research and development · research and development of science and technology
 - ③ Research and development of basic and common technology
 - ④ Fundamental science research field of man characteristic etc

1-3. Research and development of original contents deep-rooted Japanese culture and climate

Progressing media art deep-rooted Japanese and Asian own culture and climate so that may request a higher original.



(Fig1-3 Development of original contents deep-rooted Japanese culture, climate)

As concrete fields,①Various contents created by Japanese “play mind ”cultivated by Japanese culture and climate ever.

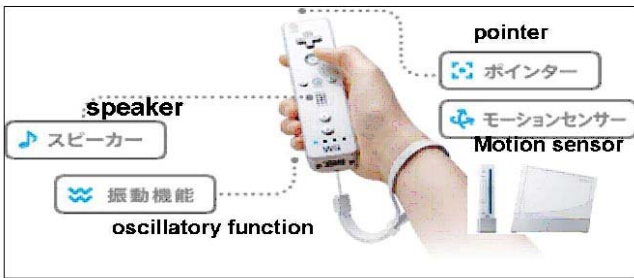
②Tangible and intangible contents that Japanese traditional culture is related to state of art technology and ③Analyzing Japanese beauty exist s in background of contents and so on

1-4. Contents created by Japanese “play mind”

Japan has established “culture of play” at a national level that is unparalleled in the world .From Emakimono or picture scroll, Japanese woodblock print UKIYOE, Kibyoshi, Haiku, Senryu and KARUTA cards to cartoon in recent years, animation, and game software those cultural gene has been succeeded ceaselessly till now .

Among them it is considered that Nintendo that has explored a new field and lead all the time in the game market in our country is the typical example. The predecessor of Nintendo was cards manufacturer founded in 1889.After video game market (NES: Nintendo Entertainment System) which has ever caused explosive boom saturated , it releases series of game soft ware that don’ t stay in the traditional so-called video game and men and women of all ages can enjoy such as educational game software, electronic dictionary, and dish recipe collection and so on and mass-produces box-office hits. Among them “DS training of adult that strengthen brain”, which is assumed to accelerate the activation of brain, was accepted to a wide age group including middle-aged people and became the firebrand of the boom.

The combination the development of fascinating contents that is accepted by a wide age group and continuous technology development (it is not necessarily modern technology) is succeeded by virtual game machine Wii in which a movement sensor is installed.



(Fig1-4 Nintendo's Console Takes the Next Leap in Video Games)

Shigeru Miyamoto (Information development Department General Manager) who has produced a variety of games in the company that were big seller tells about Wii as inside story of development that is as follows.(The text partly omitted and excerpted)

“Yes, in a word, all the developers look happy. After all, the team of our software has had a sense of crisis all the time that it’s products might not played by many people if they don’t challenge a new thing. We feel that sense of crisis and conversely, pleasure that we get it over through DS. We are going for it thanks to the pleasure that a limit of idea can be removed.”¹

“Play mind” is the keyword for leading developers in Nintendo amid difficulties of game development.

In 2007 summer, health pack(tentative name), which is installed living body sensor, is scheduled to be released by Nintendo and it aims to manage health playing game.

¹ Nintendo website “Wii Project that the president interviews” <http://www.nintendo.co.jp/jp/wii/topics/interview/vol2/01.html>

2. Utilizing multimedia in education field

2-1The effort case in USC (University of South California)

IML

Although IML (Institute of Multi Media Literacy) that works on interactive multimedia innovation is placed in IMD (interactive media department) established in2002, the function is offered to the

whole USC. IML was founded through suggestion that George Lucas, a director and graduate of USC, made to the dean of film faculty and the president. –The famous USC graduates like Lucas or Zemeckis who are active in filmdom contributed to USC, and the film faculty in USC makes its school building and studio that gained prestige its base of activities.

As we can surmise from that, the relation between film in Hollywood and television, new media industry and film faculty in

USC is remarkable and significant.-The aim to establish it is producing additional value of the film faculty and improving the value as research educational institution in USC at the same time through prevalence of ICT so that everyone can produce and edit image and sound easily, and spread of skills concerning to image and interactive media featured in the film faculty.

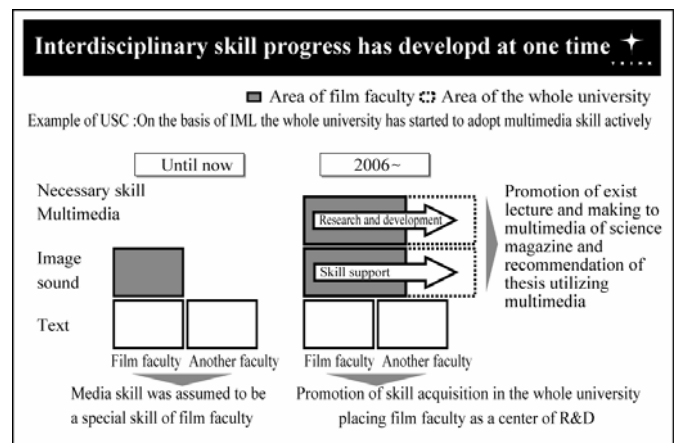


(Fig2-1 Multimedia studio at IMD)

IML defines that in this day and age when it is advanced society, it is necessary not only taking information from media passively but also multimedia literacy-the ability to create actively. As the result, it is considered that the basic environment to advance interdisciplinary uniting will be formed.

IML at first , when it was established, prepared and offered the program to request multimedia literacy from IMD and the film faculty. The experience in IML has been elaborated as refined educational program in cooperation of communications faculty and department of education, received appraisal, and it was offered to the whole university as from last year .

First it tried a method to promote



(Fig2-2) Introduction of multimedia skill to the whole university

2-2 Educational effectiveness of serious video game

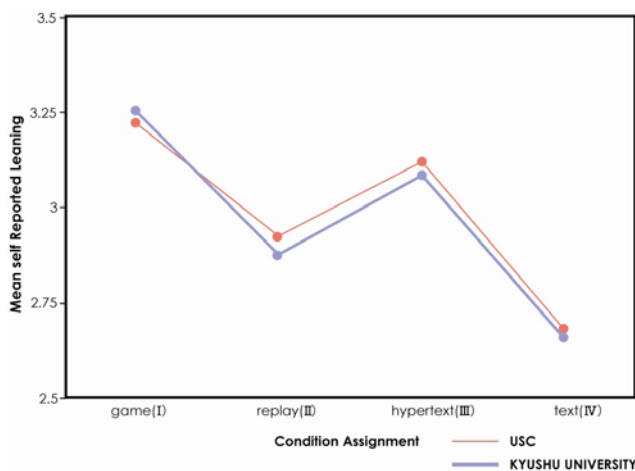
Given the interactive media feature and inherent stimulating appeal computer games are often acclaimed for their possibility and value in education. However, the comprehensive study has been still missing. Preliminary comparative studies on the learning effects of game and traditional media is promising.

In University of South California (USC), the comparative study to explore thoroughly interactive effect and media richness has been conducting by undergraduates. In the experiment a close relation of important result which was brought by comparison in four conditions (game, response, hypertext, text) is discussed.

On the basis of thesis of serious video game¹ educational effectiveness released by USC students, we compared the interest concerning to topic of usual education and multimedia education expected for the master student of Kyushu University Faculty of Design, Advanced

Digital Contents Design Unit (ADCDU) which the author belongs to, and confirmed repeatedly the effect.

(Fig-2-3) Comparison of interest to topic between usual education and multimedia education



3. Low penetrating level of science and technology and possibility of “ASOBI”

3-1. excellent environment and active information consuming

At the present time Japan ranks top class concerning prevalence of high performance camera, huge data memory capacity, the third generation cellular phone that IC card is set in. Moreover it is overwhelmingly dominant in the world concerning the spread of social information infrastructure like availableness of optical fiber cable network at home which enable super high speed data

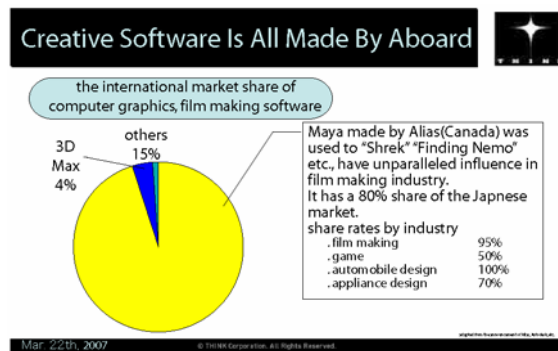
communication , digital broadcasting (the ground wave, satellite) which has interactivity using digital data and cable television net.

Also the number of blog using Japanese account for a big ratio compared to English and other major words. Furthermore it is known that Japan dominates a high ratio of eager users of next generation service such as unique short animation product using Flash typified by “Soft tank”, activity of anonymous board, 2ch for example, which is known capturing underground information, and You Tube or Second life which is developed and offered in US or the internet advanced nations.

Then it is famous that the influence of Japanese traditional art which impacted on the world art trend during 19th to 20th century. Also it is well known world wide activity of Toshio Iwai and Ryuichi Sakamoto in media art field after 90’s or Ryu Murakami in pop art.

If only these facts are seen, it is prepossessed with delusion that Japanese digital contents is growing up in especially advantaged environment.

However, in fact basic science technology, especially many of telecommunication field such as personal computer and the internet which is called IT and has a lot of points of contact directly in the dwellers, has starting point in foreign countries, so it is limited to a small number that can be called “Japan original”. (Referred to Fig3-1)



(Fig-3-1) the international market share of computer graphics

3-2. low penetrating level science technology into art

It is being even evaluated that Japanese advanced social information and infrastructural environment, eagerness of information consumption, the one which is even compared to insatiable, and up-to-date contents development toward achievement of historical art, especially the one which utilize science and technology for essential creative process has started to be inferior to other advanced nation and emerging Asian countries. Even though it is evaluated Japanese high quality game and image work, as work itself, aren’t inferior compared with the industrial commodity, it is criticized that they don’t take into account the condition of users except Japan which is lack in eagerness of foreign information sending. (Gottlieb, 2007)

Those might reflect the weak point of Japanese global competitiveness as it is such as weak purpose and receipt power of change. In addition to such a condition, the strong tendency that dealing with art as first and dealing with technology as last is cause of hindering science and technology from entering field of art and creating new value.

3-3. Changing roles by ASOBI

It is considered that we can refer to the success of whole academic Practice of multimedia education in USC mentioned above and before all, the viewpoint about the contribution of serious game to education and so on to sweep away to such a condition.

It is well known that many of motifs in Japanese excellent art works are based on the idea of ASOBI. It is set off that creator=artist and consumer of the creation=dweller, without parting, rather with network that both weave, generate opportunity of further creation and sublimate toward extremely high level art.

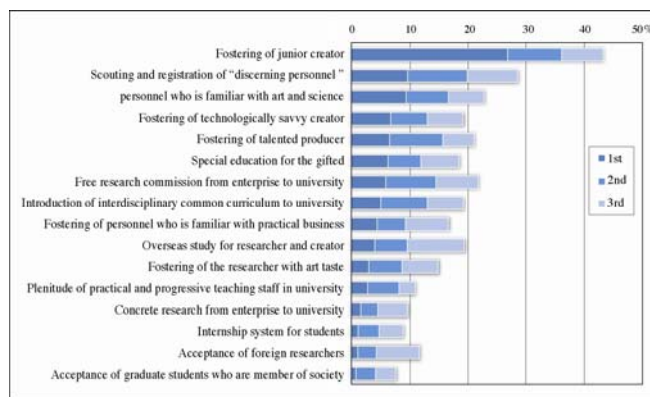
In these latter days there is also a point that the network structure that active user generation type media/contents (CGM/C) in the internet form mutually consists of the relation similar to role-playing of artists who create ASOBI in Japanese art and dwellers. (Hjorth & Mori, 2007)

This Japanese condition is much different from the relation between the art as an object appreciated in the West and science and technology for its basic analysis and evolution. It is considered that the art, which has once evolved to tell simply a religious outlook on the world and could produce works only when it was enclosed by priests and the wealthy merchants, became necessarily a object for appreciation, yet it didn't compose the network that consumed it and its feedback create further art.

However it is being tested that even western type of art, as USC example shows, development of media could prompt more things belonged to the side of consumption to be ones belonged to the side of production with tool and then when the factor of "ASOBI" is added, we could obtain higher educational effectiveness. That is exchanging plural roles conducted in such as serious game could obtain deeper finding and that is exchanging roles of creator side and consumer side and keeping various figures enhancing whole literacy efficiently shows shortcut to final solution.

As a result, experiencing a role of creator in "ASOBI" could produce an opportunity to create new imagination. If so, it is important that the relation between science and technology and art should follow it. The environment of social infrastructure as a grounding has been already ready. Now concentration on making condition is required to accelerate "ASOBI".

We conducted the survey (Fig3-2) with the cooperation of The Institute for Future Technology. It reveals the importance of personnel training for cooperation of art and science and technology.



(Fig3-2) Three high-ranking items of measures for fostering personnel who is needed for cooperation

(Digital contents survey 2007 by The Institute for Future Technology,)

4. Conclusion

It is possible that the cooperation of science and technology system talent and art design system talent create excellent contents. However, as things are that there is few successful case of cooperation in different field among Japanese university students . As the example in IML of USC, as stated above, characterization that makes the most use of own strong point could realize easy introduction. Well informed talent both sin art and science is ideal, however there aren't many. Even so, it is possible to foster interdisciplinary skill and as mentioned above, social skill of multimedia literacy "ASOBI" that is Japanese strong point and its diversity could be powerful tool in next generation education.

References

- (1) "Understanding Media-The Extensions of Man" by Herbert Marshall McLuhan, translated by Yutaka Kurihara, Nakakiyo Komoto, Misusuzu shobou
- (2) Wee Ling Wong (et al.). Serious Video Game Effectiveness. University of South California
- (3) H* - Human science and Technology Advanced Research. H-STAR Institute Stanford University.
- (4) "Research and analysis report on Asian coordinated strategy of science and technology that contributes to create digital contents" (2006 fiscal year consignment: The Ministry of Education, Culture, Sports, Science and Technology, investigation and implementation: Foundation Future engineering Institute)
- (5) Gottlieb,N.(2007) 'Language and the Internet in Japan' in M.McLelland and George (eds) *Internationalizing Internet Studies*, London: Rutledge
- (6) Hjorth, L. & Y. Mori. (2007) "Logging on Locality: A CROSS- CULTURAL CASE STUDY OF VIRTUAL COMMUNITIES."