Considering Financial and Economic ICT Education using Massively Multiplayer Online System

Takuji Takemoto
Kyoto University

1. Introduction

The purpose of this study is to propose a preventive education policy not subsequent policy for consumers' problems about finance. This purpose is similar to that of my contribution to Vol. 9 of this magazine. However, while in Vol. 9, I illustrated the present conditions and the historic background of the education policy and the suggestion for curriculum, in Vol. 10, I am going to address concrete educational methods. (Please refer to Vol. 9 of this magazine for details.)

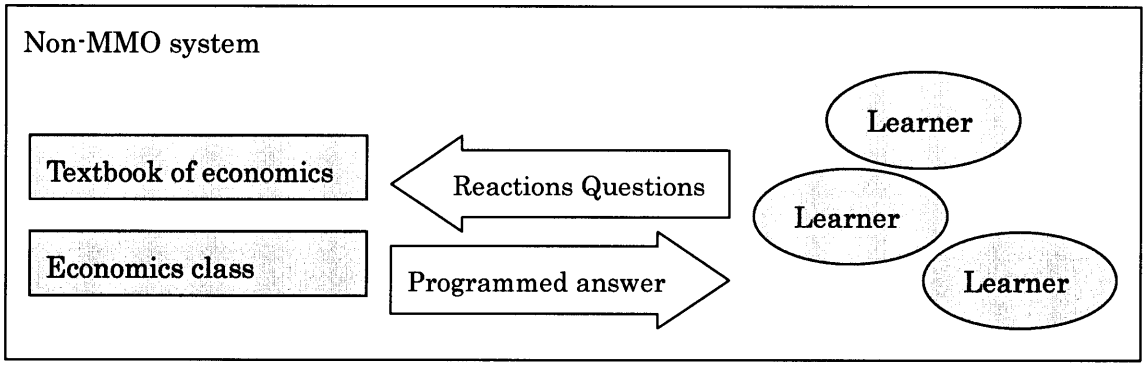
In this research, in order to solve consumers' problems regarding finance, I propose the utilization of virtually experienced financial and economic education using the ICT (Information and Communication Technology) system of the massively multiplayer online system. This produces the virtual economy and community with a large number of people sharing one server and making decisions on the server in real time.

The features that render this education method much better than others are as follows.

1) Interactive education involving many participants

2) Continuous education that does not conclude

3) Real economic experience (This means that the learners don't get only knowledge about "efficient market" in the class.)



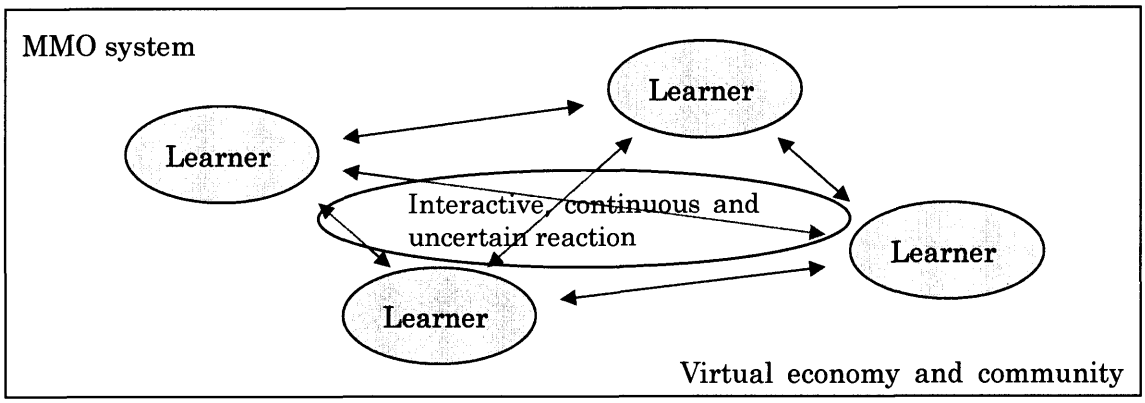


Figure.1 Differences between Non-MMO system and MMO system (1)

By this education, the learners can achieve financial and economic experiences unlike that obtained until now by consumers in our country. In addition, they can learn self-responsibility and about how to take risks in an unpredictable financial and economic society. It greatly decreases problems that consumers previously experienced.

2. ICT and education

2-1. ICT for university education

The move to introduce ICT in education has found a rapid thrust in the past several years. On the other hand, Ohara(2000) had already researched in Tamagawa University on the topic of introducing ICT into university education. He describes the role of IT in the educational sphere, the effect of ICT e-learning as the teaching strategy, and the example of its practice in Japan and the United States by pedagogy. He assumes that it will become "Result Society" in the future and that the result society should more concretely show whether to simply leave inputs as it is and to raise the attainment level, or to achieve a past attainment level as less inputs are requested. He insists that the dissatisfaction felt regarding the low efficiency or the current efficiency was what caused the move toward the ICT education.

As considerable previous researches point out, many advantages certainly exist in the ICT education in terms of not only educational efficiency but also convenience. Given below are the examples, as described by Hashimoto(2002).

1) Because there is the limitation of time and place both teachers and learners, the ICT education can help them teach and learn freely from anywhere at their own pace.
2) The learners can readily input their opinions and questions from the keyboards of their personal computers. Further, its content can't be disclosed. (Their privacy can be maintained.) Therefore, even those students who were unable to contribute previously can participate positively in the class.

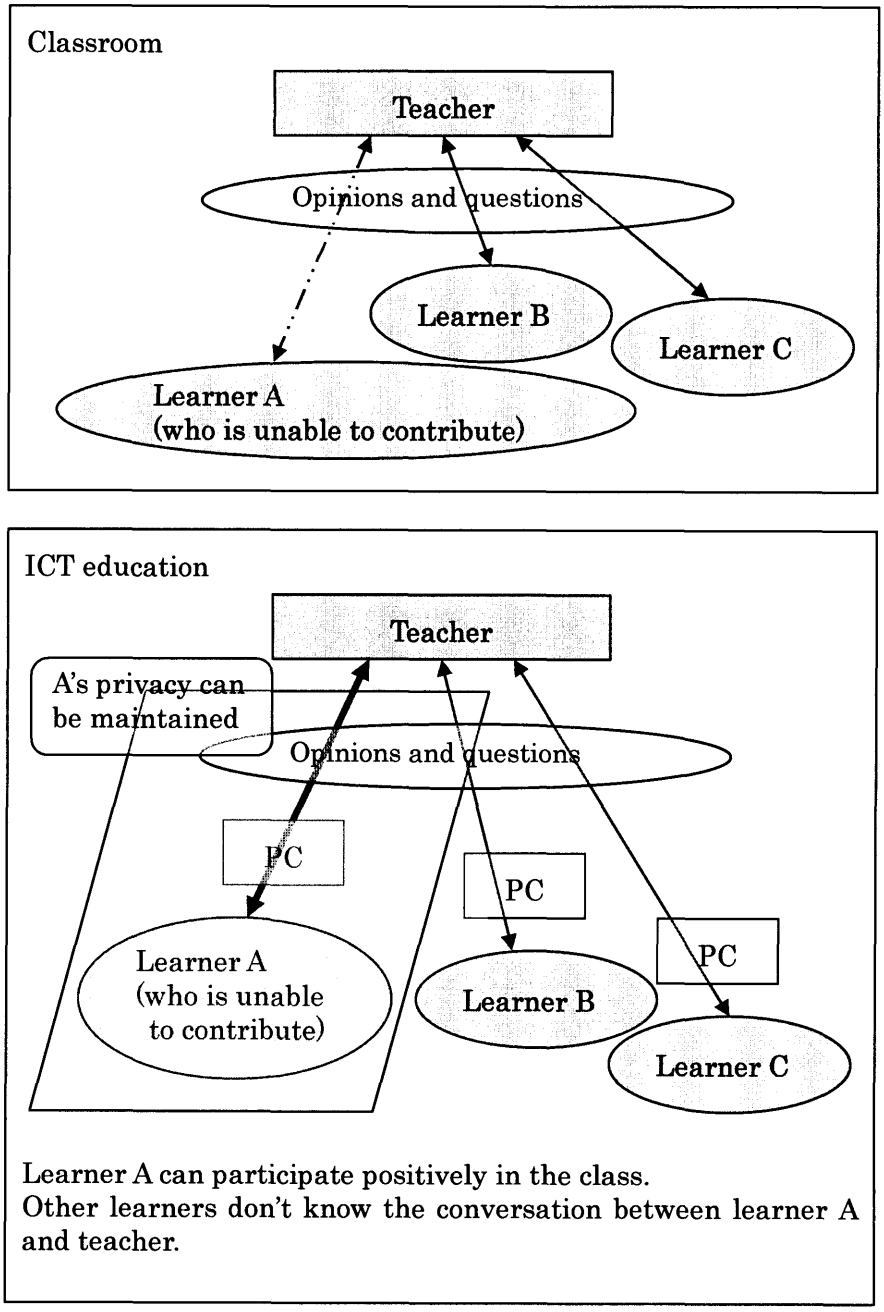


Figure.2 Differences between Non-ICT education and ICT education

3) Information is definitely and instantaneously transmitted.

4) Learners can independently prepare, review, and study whenever they miss classes.

5) It can be comparatively facilitated for both teachers and students to conduct the class together.

6) Electronic teaching material contents are accumulated, and it is possible for them to be used anytime. Moreover, the additional value and the quality can be expected to improve by repeated refreshing.

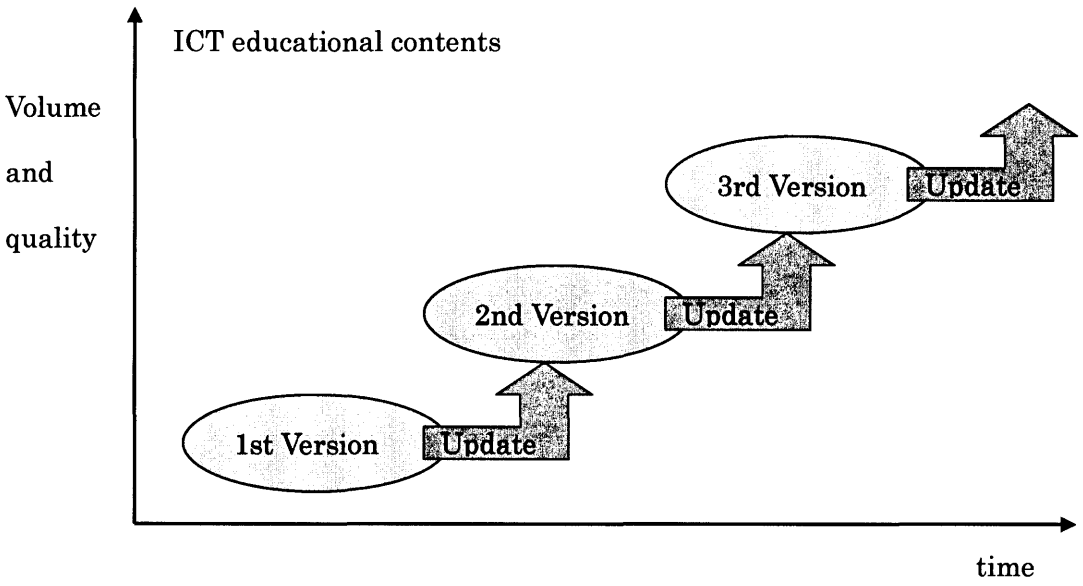


Figure.3 Version update

However, even when we obtain efficiency and convenience by the ICT education, the atmosphere of the classroom exists. Concretely, the effectiveness of a class is controlled by students' independence, which was the weak point regarding the ICT education in the past.

2-2. ICT education and teachers' roles

From his teaching experiences of the regional research course of the university in the United States, Kikuchi(2002) describes the change in the teachers' role, which can be attributed to the ICT education as follows.

1) The success or failure of a lecture depends on the teachers' teaching ability.

2) Teachers' physical condition and the responsibility to the class are the variable

factors in the education.

3) The stability element of the class is requested from the students on the basis of 1) and 2). In other words, the educational program is created on the assumption of the students' ability to study independently.

4) The ratio of various factors decreases if the teachers abandon, to some degree, the act of "Teaching" and play the "Assisting" role so that the students learn independently.

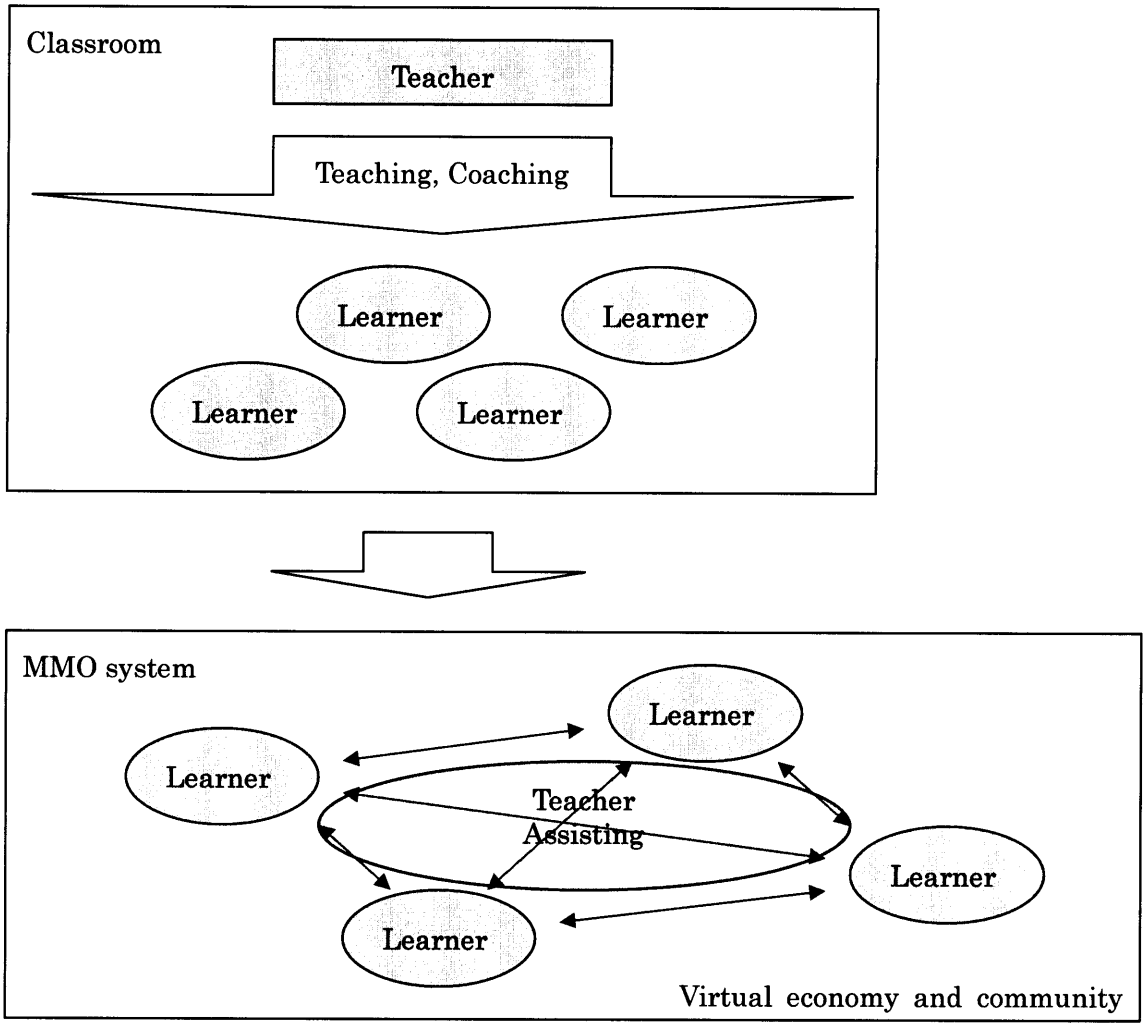


Figure.4 Change of teacher's role

According to him, the abovementioned reasons will make distance learning through the Internet the center of the new educational program.

As Kikuchi points out, the change in the role of the teacher would also be effective in

the financial and economic education in Japan. In Japan, few teachers (from elementary courses to higher education) exist who can teach finance and economics, as I explained in Vol. 9 of this magazine. However, even those teachers who do not have the expertise in finance and economics can conduct classes using ICT, because students can learn independently using the ICT tool.

The point to be noted here is that the ICT education would not make teachers unnecessary—it would change the teachers' role.

2-3. MMORPG (Massively Multiplayer Online Role Playing Game) for education

In 2-1, I described that the weak point with regard to the ICT education was the atmosphere of the class, which was controlled by the student' s independence. If the educative effect does not arise due to the lack of aggressiveness in the student, it is necessary to create interesting teaching materials.

Baba conducted research at The University of Tokyo in this respect. He researched the use of online games toward education. Needless to say, thus far, lots of educations that have used games have been discussed by various researchers. However, I refer to Baba's research because it relates to my proposal of this thesis. His research aims at 1) clarifying the possibilities of online games for purposes other than entertainment, and by this, 2) the support of the online game production.

He received the cooperation of one technical college. In addition, when history was taught in its school, he investigated whether there were the improvements in the willingness to learn and an increase in knowledge by using a certain online gaming. He formed three groups and performed the test. One group consisted of the student who attended usual classes, another had a student who played only games, and the third had a student who played a game, provides a problem, and produces the results together. He discovered that the student who had provided the problem while playing the game was more interested in history as compared to the student who attended the usual classes.

This research certainly demonstrates that a certain kind of game is effective in education. However, it is doubtful whether the characteristics of online gaming, for instance, network by large number of people simultaneously participating, is especially

effective in learning history. The student might have been sufficiently interested in history by playing the same kind of off-line game. Moreover, on playing the game used in this research, I also realized that the story in it was not at all faithful to history. If this game is aimed at history education, a wrong history might be learnt and, therefore, it is necessary to correctly match the story to the historical facts etc.

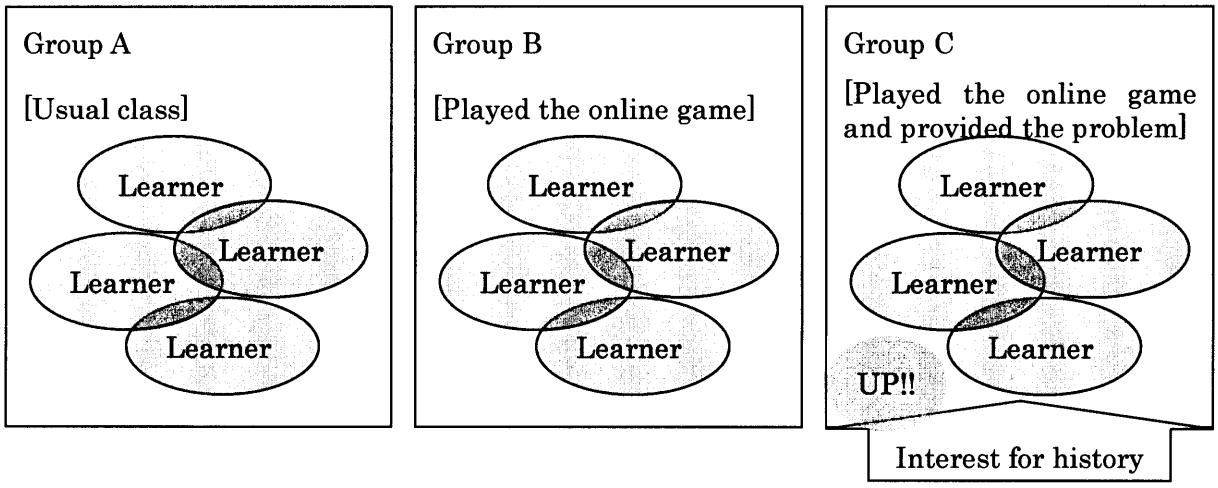


Figure.5 Educational effect in history class [Baba`s verification]

3. Effectiveness of massively multiplayer online system in financial and economic education

3-1. My research area

As against Ohara's research using the pedagogy approach, Baba's research using the informatics approach, I based my research on the business administration approach. My research determines how actual inefficiency of the monetary economy is experienced. For instance, we can satisfactorily learn subjects like mathematics and language study through classroom learning. However, for a financial and economic education, not only assumed knowledge on efficient markets but also practical experience is necessary. Taking this idea further, I want to create a small virtual economy in the server by using the massively multiplayer online system; further I would like to propose a study method that enables not only to acquire knowledge but also to experience the dynamics of the actual economy. Toward such a purpose, my research integrates the game style and interactiveness into non-coursework.

3-2. Why is massively multiplayer online system effective in financial and economic education?

This system is excellent not because learners acquire knowledge by lectures but because they gain practical experience by simulated economic activities as regards finance and economy. Learners gain experience not because an efficient judgment made by the computer but because of the inefficient mutual activity—for instance, while fixing a buying and selling price.

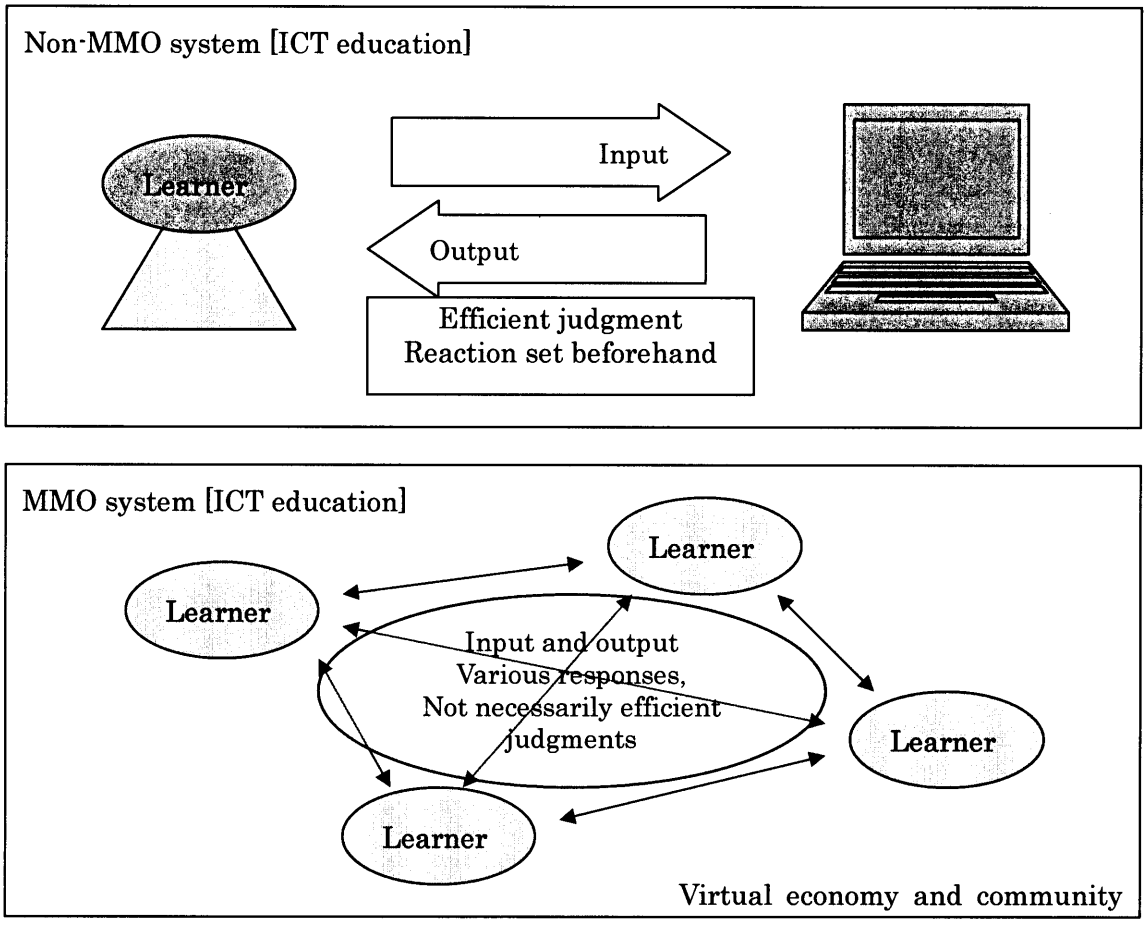


Figure.6 Differences between Non-MMO system and MMO system (2)

I will explain one such example of the educational system where such an effect occurs. It closely resembles the present online games. The following elements that attract players' interests exist in many online games called MMORPGs.

1) Combat (for non playing characters and for playing characters)

2) "Bazaar" (buying and selling for non playing characters and for playing characters)

3) Story set beforehand

4) Various events created by the managing company

5) Exchange with different cultures (two or more countries and races)

6) Beautiful graphic design

7) Real-time communications with other players

8) Experience by "avatars"

9) Evolving of the avatars

10) Group actions

11) Supplementary story that is called "Quest" (However, "Quest" is an important factor for the evolving of the avatars).

12) Production (semi-finished products for other productions and products including equipment)

13) Vocational selection (job change)

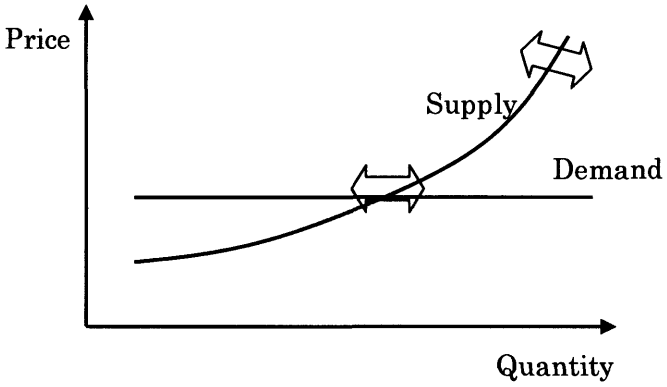
The progress of the game where these elements are included is generally as follows. My avatar is first created on the screen. Further, because the enemy corresponding to my level is defeated while operating my avatar, my avatar obtains value for the experience and money used in the game. My avatar evolves, and it strengthens if the experience value is saved. If money is saved up, equipment for the avatar can be bought, and the avatar comes easily to combat. The main elements of the game are the combat as long as this is seen, although the above is an outline of the game. However, factors such as "Quest," production, and events retain the interest levels in MMORPGs. Particularly, the level of production skills of old-timer players are high, and, as a result, they obtain a lot of money.

I pay attention to the market in the game that has dealings with produced goods. The player with high levels of production skill can produce valued equipments and items that other players want and mutually deal with. Certain games arrange markets called "Bazaar," and the price of the exhibitor of a certain product is displayed in a list. Such buying and selling is carried out with players at various levels in various places throughout the game. Moreover, the raw material for production is collected from the mountain and the sea, and the product is created by the player through several production processes. This is a virtual economy, and the player virtually experiences

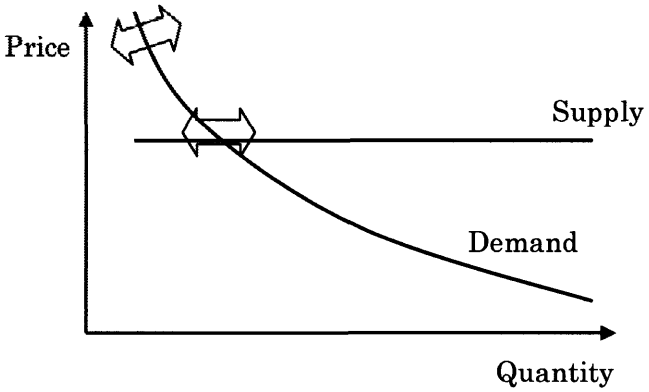
business in this manner. Prices are decided by players exactly in accordance to supply and demand. Therefore, it differs from game to game for players, and it helps learning about the market price, which people mutually decide. This is the practical type of financial education.

One of the examples of the above content is the stock trading simulation game that Tokyo Stock Exchange manages. However, the game does not involve price fixing by the player of the game. The closing share price of the security market held on the day becomes the price in the game. Therefore, the element of interactiveness does not exist in this game, because the event in the game and the supply and demand that refers to the trend of other players are unrelated. This difference between the stock trading game and an MMO system makes the latter an excellent source of financial and economic education.

[Non-MMO system] Price is decided by computer

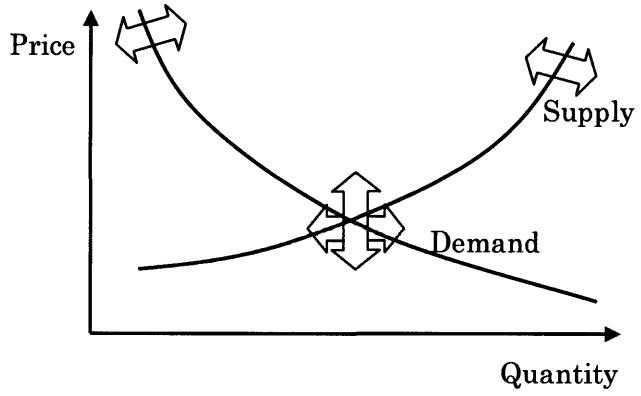


Buyer: Computer, Seller: Player



Buyer: Player, Seller: Computer

[MMO system] Equilibrium price always changes!



Buyer: Player, Seller: Player,

Figure.7 Demand curve and supply curve in MMO system

3-3. Other educational effects of massively multiplayer online system

In the MMO system, the price is not provided beforehand, and it reflects the others' behaviors. Moreover, in an MMO system, it is essential for the player to consider whether to use the same or another judgment as that of the others. The uncertain society in which it is impossible to forecast is the teaching material. Therefore, their experiences are based on the risk and self-responsibility of their actions and judgments.

Moreover, because the MMO system always remains connected to the Internet, the learner can download new information at any time. Therefore, the feedback regarding the effectiveness of the class is possible, and the program to correct a problem on the basis of the results can be updated at any time. As a result, accumulation and improvement of the know-how of the educational system becomes possible, enabling at attempting to raise the quality of education.

The feature of connecting to a large number of people simultaneously creates a new educational communication space. Not only the teacher but also the student can mutually share the uncertainty in real time by using the chat function. According to circumstances, there is also the possibility that students solve doubts with each other. This is much better than the past situation of conversations only between the teacher and the student.

4. Problems in the future regarding financial and economic education using MMO system

4-1. MMORPG is not education—it is a game

However, it is necessary to overcome some problems to utilize the MMO system toward financial and economic education.

First of all, it is important that at present, MMORPGs enjoy combat, as previously described, and the players produce and have dealings over the product to win the combat. MMORPGs cannot be diverted to education because, hitherto, there is not one designed, which is mainly aimed at financial and economic education. This is the same problem about the use of MMORPGs with respect to teaching other subjects. There is, however, an element, which is more or less related to education through games. As for us, it is at least natural to gather experiences through games. It is a mistake to highly appraise accompanying effects without achieving the principal aim.

I deny the educative effects of MMORPGs although I highly evaluate the MMO system as a new education method. I believe that improvement is necessary if MMORPG is used, mainly aiming at education.

4-2. Problem of financial and economic education using MMO system

Even if we consider using only the content that relates to a part of financial and economic education, as existing in the present MMORPGs, it is insufficient as a mode of education. I believe that the following elements can be added toward its completion as an educational program.

1) Evasion of the danger of it becoming speculation, not investment
2) Education of risk perception
3) Action of learners' trouble
4) Content that increases learners' independence

It can be termed speculation if a lot of players expect that the demand of a certain product rises and if its market price rises suddenly. It might be assumed that speculation is also one of the features of financial and economic educations. However, in such a situation, the element of gambling rises more than gaining education. Therefore,

setting up of events that become the standard with respect to which learners buy and sell products is necessary; for instance, scarcity of raw material and the change in production by random climatic variations.

Educating about the risk is important. In particular, as regards the investment education, it is not necessary to simply fluctuate between hopes and fears about the investment results. In other words, it is necessary to verify not only the size of the return but also the size of the risk in obtaining the return. The learner knows whether its risk corresponds to the return, and it becomes a financial and economic education corresponding to the real society. The system that insures accidents under transportation of trade goods exists in some MMORPGs. We should place such basic risk action methods and contents close to the laws of real societies, such as cooling-off. Further, according to circumstances, it might also be good to place the risk of exchange fluctuation from the ups and downs of the economic power etc. of a country by considering the player's group as the country.

Trouble from participants can be expected because of the large numbers of people participating in the games. However, it may create a good educative effect because of similar situations in real economies. It is preferable to develop education methods of gaining tolerance and the power to solve such participant troubles. Introducing cooling-off systems etc. may be effective.

I describe the problem of creating a positive approach among the learners toward this education. I had a previous experience of executing a trading game at class in university. The content involves seven groups of students to assemble a house, with a design provided beforehand, using scissors, protractor, ruler, several sheets of paper, and a compass. One group was made up of three to five people. However, an enough number and kind of materials are not distributed. The number of paper that becomes the material of the house was also different for different groups. The game is about exchanging and negotiating materials and tools with other teams, and the aim is to check how many houses can be finally built. In order to avoid being defeated by other groups, students were happily building the house in the class while negotiating skillfully. I knew that it was effective to add slight elements of competition and the game, although the educational purpose of this class was not to win the game, of course. In other words, the game was not the primary purpose, but it was an effective medium.

With regard to the abovementioned, financial and economic education by the MMO system that assumes education as the primary purpose can help in overcoming the problem described at the beginning, and an educative effect that has not been obtained hitherto can be expected. It is important that the main purpose is not the game but what you learn.

5. Possibility of the spread that financial and economic education using MMO system achieves

Financial and economic education using the MMO system will improve people's literacy concerning finance and economy in the future. Moreover, not only is there a decrease in the consumer trouble related to finance, there are also various other effects that are expected. The following, for instance, are some of the effects:

1) Increase in investors who can take risks because of investor education
2) Activation of finance to business ventures
3) Creation of business ventures

Further, if the level of effectiveness can be shown by a continuous experimental study on the future, it creates an internationally unparalleled education method of obtaining educational efficiency and achieving positive approach in students. Then, as seen in the case of the present Nintendo DS etc., we can expect the merging of education and amusement markets beyond the platforms of education and amusement, creating the potential of inventing a new business market.

[References]

[1]Junichi Hashimoto, "Role of Staff and System," Yoshiaki Ohara, " University class Uses ICT," 2002, Tamagawa University Press

[2]Shigeo Kikuchi, " Higher Education and ICT -Through the approach on the American regional research course," Yoshiaki Ohara, " University class Uses ICT," 2002, Tamagawa University Press

[3]Takuji Takemoto, "Analysis of Financial Program in Japanese Institutions of Higher Education," The annual bulletin No.9, 2009, Japan Academy of Personal Finance

[4]Yoshiaki Ohara, " University Class Uses ICT," 2002, Tamagawa University Press

[5]Baba's research office in Tokyo University website,
http://chi.iii.u-tokyo.ac.jp/?page_id=85, 2009/10/15
[6]Yomiuri Shinbun website,
http://www.yomiuri.co.jp/kyoiku/news/20090108-OYT8T00229.htm, 2009/10/15