Using A Mobile Game to Help Students Learning the Market Economy: Preparation of Camera-Ready Contributions to SCITEPRESS Proceedings

Jiacheng Ding[1, a, †], Zhouhua Wu[2, b, *, †]

[1] Grade 12, Hangzhou Entel foreign language school, Zhuantang Road, West Lake District, China

[2] Grade 12, Kang Chiao International School East Campus, Xihuan Road, Hua Qiao district, China

* Corresponding Author Email: {11336}@kcisg.com

†All these authors contributed equally

Abstract. The economy is often tedious and complicated for the majority of teenagers from age 13 to 18. The old-fashioned way of using lectures and books to teach could be challenging since the students are only studying an abstract concept and trying to understand pieces of knowledge from graphs and phenomena. After a series of investigations and research, we found that economics teaching and game-based teaching can be very well combined to help the students to learn better. In terms of making the subject more appealing to the students, giving students a platform to apply their knowledge to simulations, and having a deeper understanding of the concepts in the market economy by playing an educational game. A well-designed economic simulation game can stimulate students' interest, reduce the difficulty of teaching, and help them better understand the tedious content within their textbooks. Thus, we composed an 8 questions survey and collected data from 30 Chinese teenagers that come from different educational backgrounds. However, the survey was only given to Chinese students from different provinces. The total amount of samples may not be conclusive and cohesive. Meanwhile, future studies could give out surveys to students who come from different ethnic backgrounds to better understand how teenagers prefer to study around the globe.

Keywords: Game teaching, economy.

1. Introduction

With the development of the economy, the economic industry needs more fresh blood influx. In response to this demand, more and more people are beginning to study economy-related subjects. But economics is a hard subject to learn. People need to memorize a lot of definitions or understand how changes to one variable affect other variables. For example, when you study the economic system of a country, you will talk about "market economy", "mixed economy" and "planned economy". Many people who study economics will find that they spend a lot of time trying to analyze a complex situation, but always miss the application of one or two economic laws, resulting in inaccurate final results. To improve the efficiency of teaching, new effective teaching means are urgently needed. One way to improve the problem is game teaching.

Instructional games are also called "game teaching methods". A teaching method that combines learning with fun games according to teaching needs. In 2006, Auslin and Mitchell published a review of the Playcentric Approach (GCAs) teaching and coaching literature, highlighting several core concepts that justify the use of GCAs, including its developmental prospects for enhancing user motivation and diverting attention, and developing decision-making skills and effective decision makers. Oslin and Mitchell also offered additional ideas for future GCA research to help develop [1]. Learning based on games requires a certain psychological foundation. This paper argues that games are a complex type of learning environment that is difficult to understand from a single perspective. An important concept in the context of games, such as "motivation", is often related to a different

[a] https://orcid.org/0000-0001-7813-3207

[b] https://orcid.org/0000-0003-2377-4000

theoretical basis, which may be cognitive, emotional, motivational, and socio-cultural. We believe that in order for a game to reach its learning potential, all possibilities must be considered, where the focus may need to be determined according to the intent and design of the learning game [2].

Up to now, far too little attention has been paid to encouraging students to apply their economic knowledge to practical usage or taking a step deeper into the area. research in educational games, pointing out the challenges of conducting a game-based curriculum and illustrating the foundation of game-based learning. Meanwhile, barely any games are been designed to help the students in the area of the economy. Teachers want students to learn, and games are a way to help them learn by promoting motivation, engagement, and ultimately learning, so it seems necessary to use games as much as possible because they are an effective way to promote learning. She suggests that games could be used for academic purposes. Furthermore, there are only a few games that are related to the subject of economy, and the two academic-beneficial games mentioned in the essay 'Beat the Market: An Interactive Microeconomics Simulation | Request PDF (researchgate.net)' and 'A video game to supplement hybrid principles of microeconomics course: The Journal of Economic' are both no longer can be played on their main research engines, which are Google and Bing. Thus, teachers need more games are in urgent need that can make students want to learn more about the subject of the Economy. To achieve the goal, the game itself needs to be open to everyone that wants to learn about it, and the game needs to be enjoyable since the essential idea of the game is to help people interested in economic education.

At present, there are few studies on the application of game teaching to economics teaching, there are few studies on this aspect, which is an emerging teaching direction, so this article decided to design a game teaching--design a simulation game. Users just need to enter the corresponding country's economic model and market policies to choose their character to start the simulation game. The current article will discuss this issue in the following 5 parts: 1. Definition of the Market economy and why it is hard to learn 2. Using the method of the survey to investigate the target users – the students aged 13-18 3. Games as a medium to promote students' understanding of complex concepts 4. The specialty of market economy and how it adapts to the media of game 5. The specific use of simulation games in the primary teaching of market economy and its use as a tool among advanced scholars who already have enough knowledge.

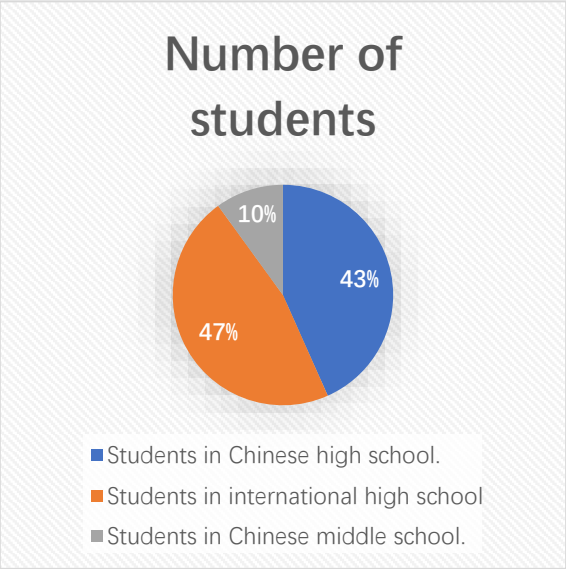
2. An analysis of game-based market economy learning

2.1. Definition of the Market economy and why it is hard to learn

The market economy is an economic system that reasources are all be allocated by what and how much people buy, not by the government. This means the reasources can be allocated very effitiency. This means all resources are being used to only make more profit and all resources will move to the high-profit side. Therefore, no firm will use the resource to produce public goods which cannot produce profit—that's why this article adds government part to make it become mix economy instead. In this economic system, every part plays an important role. Each change will influence differently for government, households, and so on. For example, the state already seems to be everywhere in the economy. It creates markets as well as regulates them. It not only protects the property but defines it. It has neither its enterprises nor are it privately owned away from them, but it is also a partnership [3] It is not difficult to see that the economic change is extremely difficult for students to learn. Furthermore, the market economy is troubling for high school students because their teachers are trying to lecture them knowledge regardless of their basic knowledge. Whenever the students try to perform well on research projects or any intellectual activities besides tests that have a standard answer. They would be lost in tons of specific nouns and concepts that they have never touched upon. The teachers are preaching the different phenomena that are been categorized by the author without explaining why is the phenomenon happening. Which could lead to confusion or understanding of an only part of the knowledge.

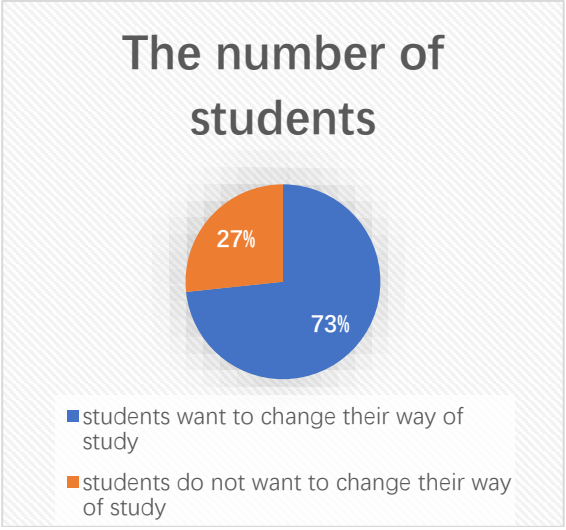
2.2. An investigation of the student aged 13 to 18

We have composed an 8-question survey of teenagers in China that ranged from 13-18 years old. The survey is about how much the students want a new means of studying serious academic courses. As for the survey, we sent the survey to 30 students in four different cities of Shanxi, Shanghai, Beijing, and Suzhou that do not know each other. Of the 30 teenagers, 13 of them finished the Chinese public high school curriculum, and 4 of them are currently enrolling in the international high school program. The rest of the 3 other kids are currently enrolling in the Chinese public middle school program.



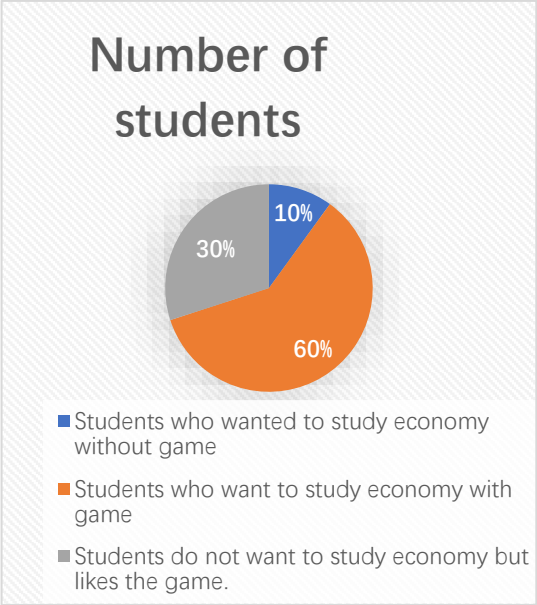
Graph 2.2.1 The number of students involved

We used Tengxunwenjuan to compose 30 copies of our survey, and we sent the 30 copies on Chinese social media called Wechat. Then we received the answers from each online and analyzed their answers. Based on the answers we received there are 22 students based on our investigation want to change the way they are currently studying to game-based learning.



Graph 2.2.2 The number of students who changed their preference to study.

Furthermore, based on our survey investigation, all 30 students liked the video game. There are only 3 students from our investigation who showed their interest in the subject of economy. However, there are 18 students out of the 27 students who would like to study the subject of the economy if they are using the means of the videogame.



Graph 2.2.3 The number of students who want to study an economy with the media of games.

According to these data, we think that the approach of game-based learning is appropriate for our study. And to the attitude toward studying the subject of the economy shifts of the thirty Chinese teenagers. We think that game-based education about the economy is feasible and acceptable to teenagers.

2.3. Games as a medium to promote students' understanding of complex concepts

Video games have become are an $18 billion industry. More than 60 percent of households have at least one person who is a regular gamer. Video games are more interesting because they transcend many traditional forms of media. When people play video games, they make decisions in the game. For example, they decide what type of item to take, and which road to take. From a reader-response theory perspective, this kind of decision adds a whole new dimension to video games. At the same time, video games can be a book-free learning experience in which people interpret abstract concepts, experiment with otherwise difficult knowledge, and then learn from their experiences to guide future actions in the game. These processes can help students quickly adapt to the learning environment and find human thinking patterns, symbolic interpretations and actions in a particular environment [4]. Games are a good way for students to learn. If teachers want to connect education and learning, they need gamification. According to the Oxford English Dictionary, the term "gamification" refers to "the application of typical game elements (e.g., scoring points, competing with others, rules of the game) to other areas of activity, usually as an online marketing technique to encourage user engagement with a product or service". Similar concepts can be expressed through expressions such as "game-based learning" and "gamification of learning". From a merely theoretical point of view, these methods can be grouped under the umbrella of active learning, an emerging educational trend that aims to engage learners and focuses on knowledge application rather than knowledge acquisition. It indicates a shift from the traditional teacher-centered approach, in which experts impart before teaching activities, to a learner-centered approach. [5] Cognitive, motivational, emotional, and socio-cultural perspectives on game design and game research can fully capture what games must offer to learn. These ideas show what enhances the potential of games in education. Such an integrated approach allows us to go beyond simply learning goals and prepare for future learning. This requires the incorporation of playful learning principles into the design, rather than being an add-on to an existing structure, which is called gamification. Look at games and playful learning as a series of activity levels (cognitive, emotional, behavioral, and socio-cultural) in which different learners engage, viewing game design elements as strategies [6]

2.4. The specialty of market economy and how it adapts to the media of the game

Games as a form of entertainment have been widely applied in the academic area for a good reason. "Games as educational games are such content: they can be defined as video games or interactive applications whose primary purpose is not only to provide entertainment but also to provide training in the field of education." [7]. Video games can be used for academic purposes and encourage students to learn more complex knowledge. For example, in the area of economic learning, the game shows you whether your economic strategy is sound in a visual and digital form (how much money you make). At the same time, a simple game diagram can help students quickly distinguish the differences between different economic forms. For example, the market economy focuses more on the allocation of resources, and there is no government intervention. The planned economy is directly under the overall control of the government. Video games have complex situations which need users to understand the concept for them to be able to be successful video games. The characteristic of changeable situations in video games could be an appropriate tool for helping the students to understand complex concepts of the economy. 'With the help of games, learning efficiency and engagement of students and staff can be greatly improved. Because they embrace learning instead of seeing it as a burden that takes a lot of time and still requires a lot of stress' [8]. Meanwhile, the appliance of game-based education has been proven with successful examples. 'They concluded that because of their more reflective and metacognitive subject matter, students who participated in computer simulations were more likely to learn useful knowledge and hand in meaningful learning outcomes than students who attended lectures.' [9]. With the given example from previous research, this article thinks game-based learning would facilitate students' understanding of complex concepts. The market economy is a type of economy that is independent of the intervention of government. 'In such a market economy, economic decisions and pricing of goods and services are influenced by the interaction of a country's citizens and businesses. There is no guarantee that there will not be some government intervention or central planning, but for the most part the term refers to a more market-oriented economy.' [10]. 'The concept of a competitive market has much in common with a democratic society in that no individual or firm is allowed to exercise power over another individual or firm. The general principles of freedom must be protected in the face of repeated attempts by individuals or groups to expand their influence and gain power, whether through lawful means or actions that are not permitted by law. Competition benefits almost everyone, and although few people like to compete with rivals in their field of activity, they still have to accept it.' Therefore, combing the subject of market economy and videogame together made it an opportunity for students to learn and compete in a virtual world without having to risk any consequences that they might be concerned about in the real world. Similarly, successful videogame and the market economy all share the core value of competition. For examples, Player Unknown Battle Ground from the blue hole company, League of Legends from the Riot company, World of Warcraft, Overwatch, Starcraft from Blizzard, and Counter-Strike: Global Offense from VALVE and Hidden Path Entertainment. All of these games are attractive to gamers because they allow gamers to compete with each other. Therefore, the competitive market economy should adapt to the platform of videogame without major issues or lack of information because of their similarity. Thus, using the mean of the videogame to lecture teenagers on the subject of the market economy should be successful.

3. Conclusions

Many students are unsatisfied with how they are been taught by their teachers or their school. They think the traditional way of teaching cannot meet their needs for economic learning. To improve students' interest in learning, we hope to design a simulation game to help students better study the economy. Game teaching has many characteristics, for example, it can improve students' interest in learning and use auditory, visual, and other senses to present. So that students can understand some complex concepts more simply. The ability to play you also gives them a more intuitive way to measure their economic strategy using data and other tools. In the corresponding economic

environment, whether their economic strategy can be achieved expectedly. This gives them a chance to practice at a low cost. The article thinks that game teaching has a very big development space in the economy. But it is a pity that the survey conducted in this article is very limited. Only a few dozen Chinese students were surveyed. This is bound to skew the results a little. In the future, studies should collect students from different ethnic backgrounds and increase the randomness when they are selecting the experimentees to increase their data accuracy.

References

[1] Harvey, S., & Jarrett, K. (2014). A review of the game-centred approaches to teaching and coaching literature since 2006. Physical Education and Sport Pedagogy, 19(3), 278-300.

[2] Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of Game-Based Learning. *Educational Psychologist, 50(4),* 258-283. https://doi.org/10.1080/00461520.2015.1122533

[3] Harris, R. (2004). Government and the economy, 1688–1850. In R. Floud & P. Johnson (Eds.), The Cambridge Economic History of Modern Britain (pp. 204-237). Cambridge: Cambridge University Press. doi:10.1017/CHOL9780521820363.009

[4] Sandrone, S., & Carlson, C. (2021). Gamification and game-based education in neurology and neuroscience: Applications, challenges, and opportunities.

[5] Zhong, Q. (2019) Design of Game-Based Collaborative Learning Model. Open Journal of Social Sciences, **7**, 488-496. doi: 10.4236/jss.2019.77039.

[6] Noemí, P.-M., & Máximo, S. H. (2014). Educational Games for Learning. Universal Journal of Educational Research, 2, 230-238.https://doi.org/10.13189/ujer.2014.020305

[7] Trybus, J. (2015). Game-Based Learning: What It Is, Why It Works, and Where It's Going. Miami: New Media Institute.http://www.newmedia.org/game-based-learning--what-it-is-why-it-works-and-where-its-going.html

[8] Vlachopoulos, D., & Makri, A. (2017). The effect of games and simulations on higher education: a systematic literature review. *International Journal of Educational Technology in Higher Education, 14*, 1-33.

[9] The Investopedia Team. (2022). Market Economy by THE INVESTOPEDIA TEAM Market Economy Definition (investopedia.com)

[10] Eekhoff, J., Moch, C. (2004). Competition — the Core of a Market Economy. In: Eekhoff, J. (eds) Competition Policy in Europe. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-24712-8_1