



RESEARCH ARTICLE

The Design of Educational Animations for Financial Planning Knowledge

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The occurrence of financial crises illustrates how the lack of financial management education will lead to the deterioration of the financial situation. Financial management is a subject that must be learned in life. Personal financial planning knowledge can be presented using digital animation and animated teaching materials. This study designed virtual animated characters to explain financial management, investing, income, expenditures, tracking spending, insurance, third-party liability insurance, claim limits, and the medical protection of casualty insurance. Plotagon Story which is a type of animation production software, and PowerDirector were used for the editing, dubbing, and post-production of subtitles to complete a video. This study created teaching materials with digital animations containing sound and light effects to attract students' attention while learning financial planning knowledge. When students find a class interesting, they will change their learning attitude, and their attention, understanding, and learning motivation will be improved.

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INTRODUCTION

To implement teaching innovation and strengthen the talent cultivation task of schools, Taiwan's Ministry of Education (2021) has promoted the implementation of teaching practices in colleges and universities to improve the teaching quality of teachers and the learning effectiveness of students. Questions are raised based on the education sites or literature. The Ministry further advocates to introduce technological media and use animated images in course design, teaching methods, and teaching materials (Hao, 2022). Therefore, to induce students' learning interest, the Ministry of Education encourages colleges and universities to use digital teaching materials to assist in teaching.

Lei (2020) conducted a questionnaire survey on students and found that while 50% of the students agreed financial management knowledge is important, only 13% of them would actually search for professional books for further learning. Meanwhile, most of the respondents chose to obtain investment and financial management information from the Internet. From this research and analysis, it could be seen that websites are a more favorable choice than books when it comes to financial management knowledge. This study used animations to present teachers explaining financial management knowledge. These digital animations could be uploaded to and shared on the Internet, allowing more students to browse and study the materials.

Tseng (2014) mentioned that the teaching objectives for financial management responsibility and discipline emphasize the need for people to make choices, as they cannot have everything they want due to limited financial resources. However, each financial decision comes with an opportunity cost as well as different benefits, costs, and consequences. It is necessary to teach students about being responsible for their future financial well-being. Through the coursework, students should be able to

recognize multiple sources of information and services and compare different types of incomes and expenses before making a decision. Systematic learning of decision making can help people make the right choices. Financial management courses in schools can provide financial knowledge and skills learning, and lay the foundation for developing civic qualities (Tseng, 2019). Financial management courses can be used to cultivate better savings habits, lower credit card default rates, better repayment records for unsecured loans, and lessen the risk of impulse shopping in students. Such courses can prepare students for future financial planning and management needs by teaching them financial management knowledge before they leave school.

Improving college students' knowledge of insurance is also an indispensable part of improving their financial knowledge. Teaching insurance knowledge allows students to be aware of the importance of insurance. In the past, people generally believed that insurance was just a monetary investment that had no real use in financial planning, and that they could only be compensated for a loss of money due to accidents. In fact, insurance is closely related to people's lives. If the importance of and the correct knowledge regarding insurance can be taught in schools, students can not only understand insurance more clearly but also take advantage of it.

2. RESEARCH MOTIVES

Huttel et al. (2019) and Ni (2020) pointed out that the rapid development of information technology has promoted the reform and innovation of education and learning environments. Teaching activities involving digital technology are significantly different from traditional paper books in terms of the level of understanding and the professionalism of the learning effectiveness. In other words, supplementary animated teaching materials can significantly improve students' learning motivation. In terms of improving learning motivation, the experimental group with the supplementary animated teaching materials has a significant difference in improving students' learning motivations, moreover, supplementary animated teaching materials can also help improve the teaching effectiveness of teachers.

Animated teaching materials are more attractive than ordinary textbooks when used in classrooms. With the advent of the digital age, digitalization has gradually changed people's habits, and this must be reflected in financial management education, as the previous textbook teaching method is no longer sufficient. Moreover, students today generally have trouble concentrating during traditional lectures in the classroom. It is difficult for them to absorb correlative knowledge of financial management, insurance and claim settlements, and medical protection. However, the sound and light effects of animated multimedia teaching materials can attract students' attention. Digital teaching animations can help students develop an interest in the learning materials during watching and listening. Such animations can also help students improve their memory and learn knowledge.

3. RESEARCH PURPOSES

As students generally study in classrooms, this study created a digital classroom scenario in which 3D-animated teachers explained the basic concepts of tracking spending, financial management, insurance and claim settlements, and medical protection. In this way, the knowledge could be widely used on the Internet. Through effective digital education, students could understand the necessity of financial planning knowledge and learn how to avoid being deceived by distinguishing between real and fake financial investments. This study taught students the importance of finance and financial management as well as insurance and claim settlements through the digital classroom experience so that the students could learn correct knowledge and apply it in their future life and planning.

4. LITERATURE REVIEW

4.1 The importance of professional knowledge to student development

A healthy and wealthy life is only available when individuals gain exposure to the financial management and investment market as soon as possible, so as to strengthen their knowledge of investments and financial management and cultivate the common sense of relevant financial literacy. At a national level, financial literacy can also enhance a country's competitiveness.

Developing a savings habit is a virtue in conventional wisdom (Hsiao et al., 2018). Brown et al. (2013) pointed out that the financial knowledge gained from financial management education can improve young people's understanding of debt and reduce their dependence on debt. Kim and Chatterjee (2013) found that people who have savings accounts in their childhood are more likely to have greater financial assets and be more responsible about money management in adulthood. Tseng (2010) mentioned that financial management education is a new course for most students, and that gender differences do not affect financial literacy before financial management education is implemented. Gutter et al. (2009) studied the financial knowledge and behaviors of students in fifteen different universities in the United States. The popularization of financial knowledge in high schools of different states was studied in his research, and the results showed that states with a more rigorous attitude towards financial knowledge popularization policy and a certain degree of regulation (for example, introducing financial knowledge into the course content) produce students with a significantly better understanding of and performance related to financial knowledge, savings, and other financial behaviors when they are in college. Therefore, the content of the animated teaching material designed by the current study included financial management and finance knowledge.

Huang and Chi (2008) mentioned that school is the most obvious starting point for the financial management education of young people is in school. Currently, there is no better place to have access to more young people than schools. Therefore, this study suggested that the popularization of knowledge and concepts related to financial planning for college students should be included in college courses, which is important for the education of financial planning management of college students.

Chen et al. (2012) pointed out that individual insurance, group insurance, and social insurance are the three pillars that maintain social security. In addition to self-earned savings, there is also social insurance provided by the government. By integrating commercial insurance and social insurance, measures that guarantee students' safety can be implemented, and more benefits will be sought for students based on the principle of "what is taken from students is used for students".

Hao and Chen (2012) proposed that an important feature of insurance is the creation of a social safety net. In other words, compulsory insurance allows people to address possible social problems with sufficient resources. If there is no insurance, an individual may be responsible for an accident claim, and the situation may be difficult to handle. For students in Taiwan, the Student Safety Insurance can handle most problems, and other special problems can be addressed by government budgets or by establishing special foundations to provide assistance, which is more in line with social fairness and justice. For example, one social welfare group has a foundation that provides help for students who have tried to harm themselves. Meanwhile, teachers should also be trained in life education. There should be a series of supporting measures that can allow Student Safety Insurance to do its job, rather than damaging the mechanism of Student Safety Insurance.

Przybytniowski (2017) analyzed the level of insurance knowledge of students from Subcarpathia Province, Poland. His study found that most students have insufficient knowledge and understanding of insurance due to the changes in today's consumption environment and lifestyle. More than 50% of young people aged 21 to 25 have seriously insufficient knowledge of insurance. In addition, his study indicated that the rural-urban divide is also significant. The proportion of people who are highly aware of insurance knowledge is higher in cities with a higher population. At the same time, the improvement of students' financial knowledge and their understanding of risk and the operation process of insurance can lead to financial risk reduction. A unique value of insurance is that it can protect consumers from unpredictable risks and catastrophic losses in life, health, retirement, private property, and business operations (Deloitte, 2022; Ikumapayi et al., 2024; Prasongthan et al., 2024;). Financial management behavior in the insurance category has a certain influence on financial management perceptions.

The digital teaching materials produced in this study included those related to investment and financial management, income, expenditures, tracking spending, insurance, third-party liability insurance, claim limits, and the medical protection of casualty insurance.

4.2 The attractiveness of teaching materials with digital animations to young people in knowledge understanding

When digital teaching materials are integrated into teaching practices, the integration of professional knowledge can contribute to effective teaching. Based on the psychological fact that students like to listen to stories and watch digital animations, when educational animations of financial management, claim settlements, and finance can be designed in the form of movies, which can be presented in the classroom to improve students' interest in learning. In other words, teaching methods using animations are an effective strategy, and they can indeed improve students' performance and promote knowledge transfer (Karaksha et al., 2011).

The novel multimedia expression methods of educational animations can be widely used to assist students with increasing their reading comprehension knowledge. Specifically, animations centered on human characters are better able to attract young people to understand and discuss knowledge. 3D characters are also of great importance (Shiu & Chung, 2010). The Internet plays an indispensable part in the dissemination of reading comprehension knowledge for young people. If the administrators of the Internet communities want passive learners to access knowledge more easily, they must provide new information and stimulate discussion so that learners can be more engaged in knowledge understanding.

5. RESEARCH METHOD AND DESIGN

5.1 Selection and adoption of tools

This study used the smartphone app to download Plotagon Story, an animation production software, after completing the action list and the timeline and used PowerDirector for the editing, dubbing, and post-production of subtitles to complete the video.

Plotagon story

Plotagon Story is a video production app, and it is suitable for the production of teaching materials. In this app, after inputting lines for the designed actors and scenes, the software will convert the text input by the user into an animated video. Its principle is to use the extension of the text-to-speech function, which allows virtual characters to speak the words input by the user. Microsoft also uses this system for sign language translation. Now, screenwriting simulation software goes one step further by using the text-to-movie conversion function to allow users to easily create 3D animated movies.

Power director

Power Director is used to import, edit, and export videos. It has semi-professional functions that are suitable for integration (adding a soundtrack, sound effects, opening special effects, and subtitle arrangements), editing, and outputting videos.

5.2 Core concepts and animation presentation of this study

Figure 1 is the production flow chart, and Figure 2 is the instructions for Plotagon Story.

- (1) Dialogues were designed to bring out the key points when producing digital educational animations for financial management.
- (2) In the animated video, a female teacher explains the key points of financial management, brings forward information the students may lack, and proposes three directions: increasing income, reducing expenditure, and tracking one's spending.
- (3) 3D characters with body movements were inserted into the animation, and dialogue scripts were added.
- (4) After searching for financial management and insurance information, the obtained data were written into a story and dialogue scripts were designed. After the completion of the 3D characters for the salesman, female teacher, and students, the video was produced, edited, and dubbed. Each

animation segment was combined to form a complete video, and subtitles and graphics were added to complete it.

[Figure 1 is about here]

[Figure 2 is about here]

Instructions for Plotagon Story, an animation production app

(1) Editing area

On the Plotagon Story page, click the upper toolbar to insert the items to be added, such as scenes, dialogues, text, character movements, and light and sound effects. After a new item is added, a related editing box will appear in the lower field.

(2) Editing box

Editing is available in editing boxes. The video is presented mainly in the form of scenes. Users can add pre-designed scenes or characters here and control the changes in camera movements. Users can add lines or interactive movements for the 3D characters here. After text editing, users can record voices to make the digital animations livelier.

(3) Preview and export

Click the button at the bottom to save the completed video. Users can play the video in the preview area before exporting it. The preview function is indispensable for more subtle adjustments before the completion of a video. The video production from the before-stated steps is not completed until the resulting video is exported and saved.

The operation steps of Plotagon Story and PowerDirector are shown in Figure 3:

Power director instructions

(1) Import video

Import the video produced by Plotagon Story into PowerDirector. PowerDirector is mainly used for post-production. Although Plotagon Story can complete most parts of video production, its production flexibility is lower than that of professional video editing software, thus post-production is required.

(2) Add transition effects

Use the editing function of PowerDirector to add transition efforts to the video, thereby making the animation transition and camera movements produced by Plotagon Story smoother, making up for the special effects and camera movements, which are not supported by the free resources of Plotagon Story.

(3) Add subtitles

The timeline sorting function of PowerDirector gives better performance for subtitle sorting and reduces the possibility of subtitle delay and audio track drop.

(4) Edit video

Video editing is the main function of PowerDirector. Use PowerDirector to edit imported videos and add different sound effects and different scenes for better performance. PowerDirector has good performance in editing and making sound effects and background music.

(5) Final confirmation and output

To confirm the editing, users need to play the edited video through the video preview window and check the subtitles, transition animations, and special effects for errors or mismatches to ensure the smoothness and beauty of the video. Sound effects should be as clear as possible. With content dubbing as the main focus of the sound, users can add sound effects and background music when appropriate to create a more vivid video performance.

[Figure 3 is about here]

Images from an educational animation are shown in Figure 4 to Figure 15 below. In the animation, a teacher explains financial planning to the students, which includes the knowledge of investment and financial management, income, expenditure, tracking spending, insurance, third-party liability insurance, claim limits, and the medical protection of casualty insurance.

[Figure 4 is about here]

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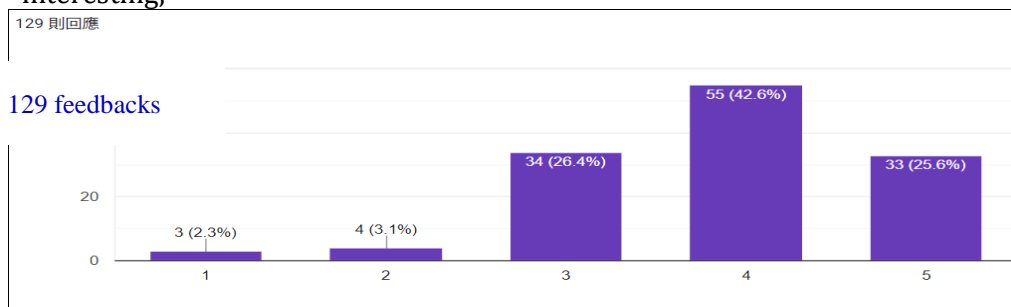
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[Figure 15 is about here]

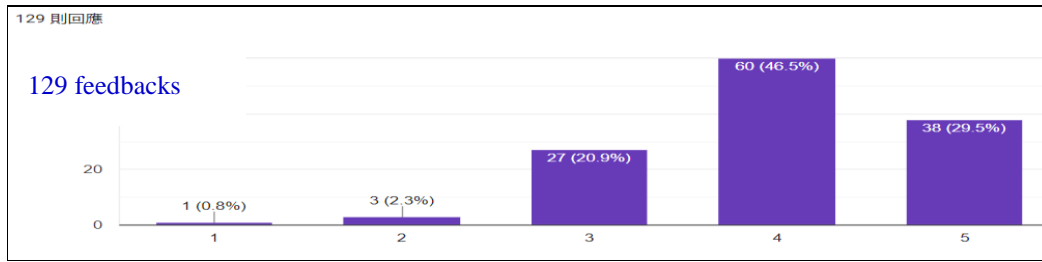
Through the steps including writing scripts of financial planning and claim settlements and dubbing in Plotagon Story and PowerDirector, this study was able to create an introduction to financial management for teachers to use in their lectures. Knowledge from the lectures could be transferred with the help of animated characters with lively movements and dialogues, thus making the lectures more appealing to the students. In this way, the students could better absorb the knowledge of financial management, tracking spending, finance, insurance and claim settlements, and medical insurance, and be further guided to think about financial planning in their lives.

It was found in the questionnaire survey of 129 students in two classes who had experienced teaching assisted by digital animations that:

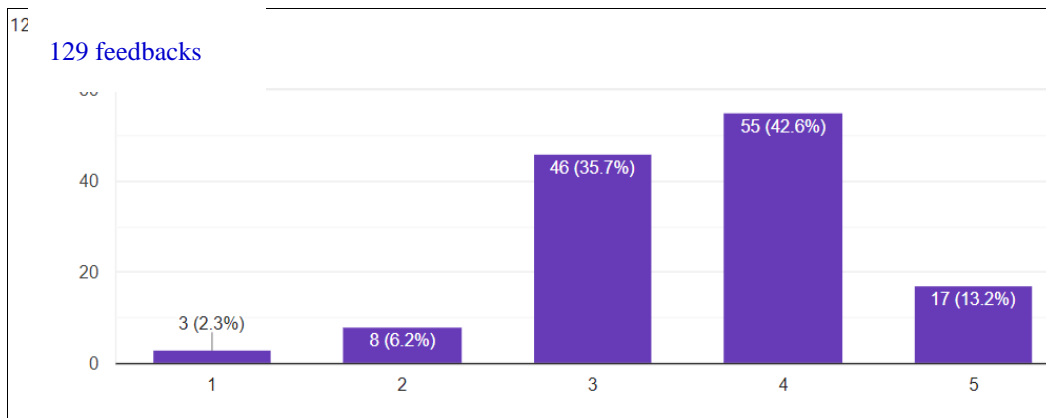
- (1) 88 students (68.2%) felt that the animated teaching materials made the class more interesting;



- (2) 98 students (70%) felt that the digital animations were easier to understand than general books; and



(3) 72 students (55.8%) changed their learning attitudes after watching the digital animation-assisted teaching materials.



From the feedback of the students in Class 2 on the learning effectiveness of the educational animations, it was found that the animated teaching material helped the students learn basic concepts and improved their understanding of financial planning. The students felt that the class was more interesting when animations were used as supplementary teaching materials. Their learning attitudes showed a positive change, and their attention, understanding, and learning motivation were improved. This finding was similar to the results of Ni's (2020) study on the teaching practices of an animation-assisted financial course on a trust for students.

6. RESULTS

The animation designed in this study was mainly about the basic elements of financial management, finance, insurance, and claim settlements, including increasing income, reducing expenditures, cash flow control, and insurance. An insurance case was brought up in this educational animation of financial management. In this case, a salesman character persuaded students to buy financial insurance products using false interest rates. Then, a teacher character corrected the students' concepts and explained the differences between various financial products and the basic knowledge of financial management, finance, insurance, and claim settlements. After watching the animation, the classes held spirited discussions, clearly showing the learning effectiveness of the materials. This animation could be suitable for various multimedia teaching platforms, such as u-Learning or streaming communities. As a result, the concepts of financial management and insurance could be popularized, and learners with low learning willingness could take the initiative to learn, absorb, and understand this knowledge, thus promoting financial management education.

This edutainment learning mode allowed the students to learn by watching digital animations, thereby making their courses more life-oriented and implementing literacy teaching in life. The supplementary digital animation helped strengthen the students' financial management education and enabled the students to establish correct values about money and consumption, understand money management correctly, and avoid improper investments or debts. The animations provided the students with correct knowledge of financial management, finance, insurance, and claim settlements, which are the foundation for basic financial education. In the future, with the help of digital education in financial management and finance, students can receive high-quality life and career planning. Financial planning education can cultivate the correct values of people and promote social stability.

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APPENDIX

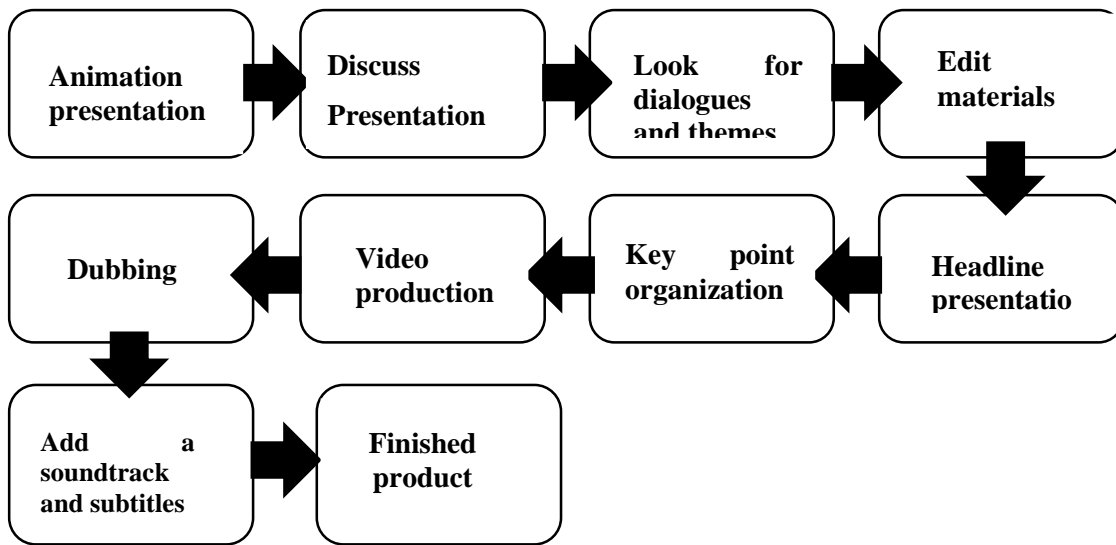


Figure 1: Production flow chart

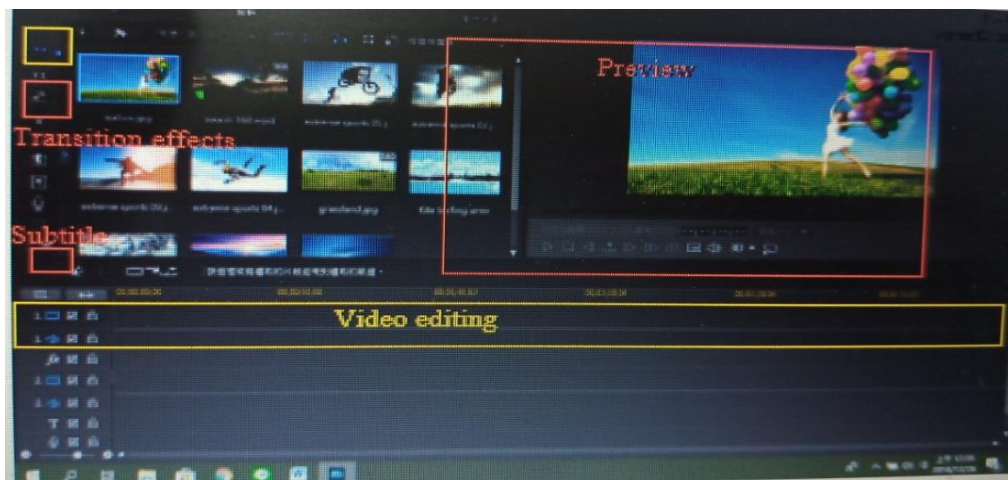
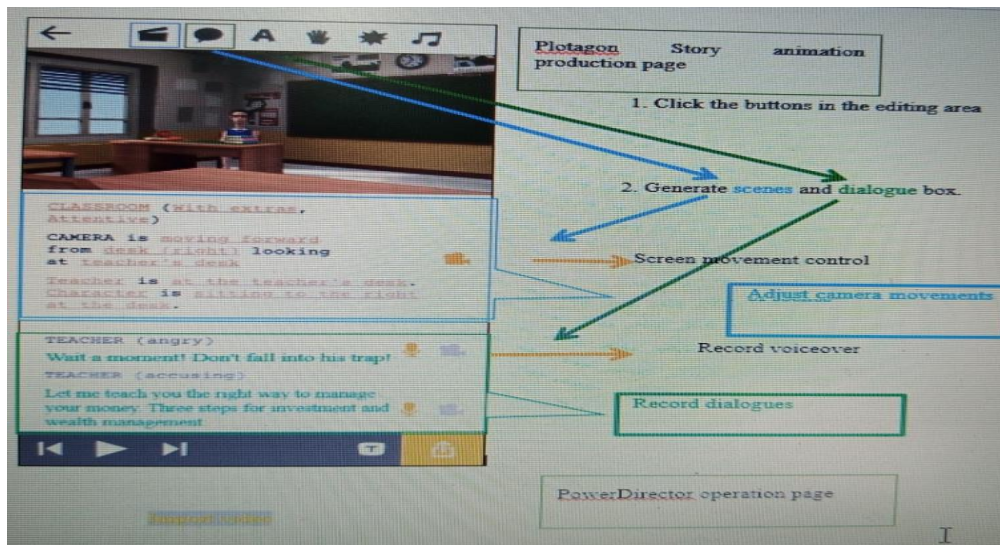


Figure 2: Operation interfaces of Plotagon Story and PowerDirector

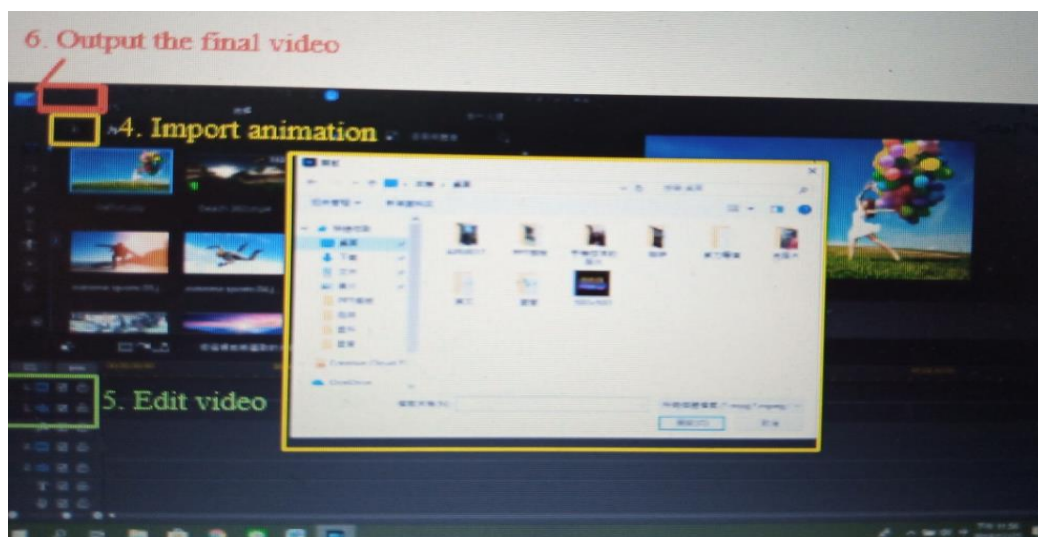
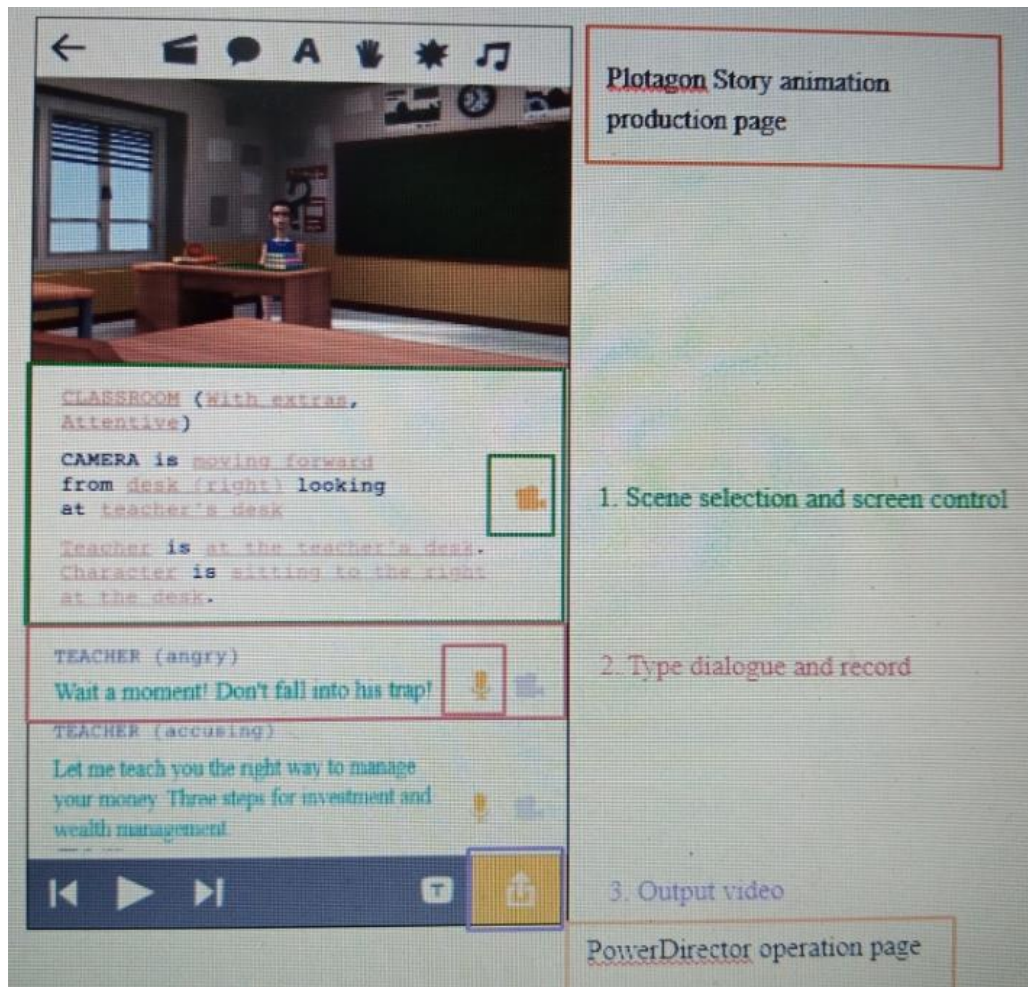


Figure 3: Operation steps of Plotagon story and PowerDirector



Figure 4: Classroom scene



Let me teach you the right way to manage your money.

Figure 5: The female teacher explaining financial management



Figure 6: Three steps of investment and financial management

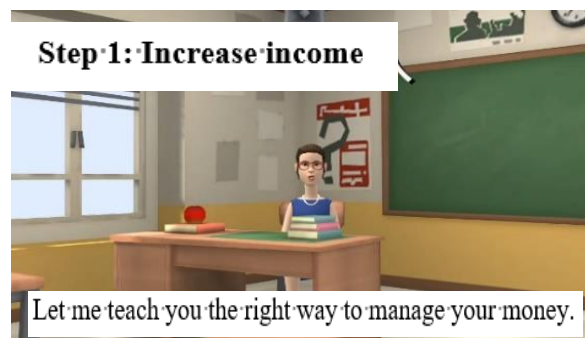


Figure 7: Explaining how to increase income

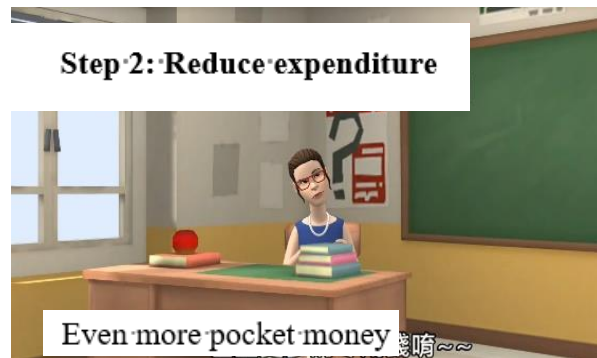


Figure 8: Explaining how to reduce expenditures



Figure 9: Explaining how to track spending



Figure 10: Explaining the concept of insurance



Figure 11: Introducing third-party liability insurance

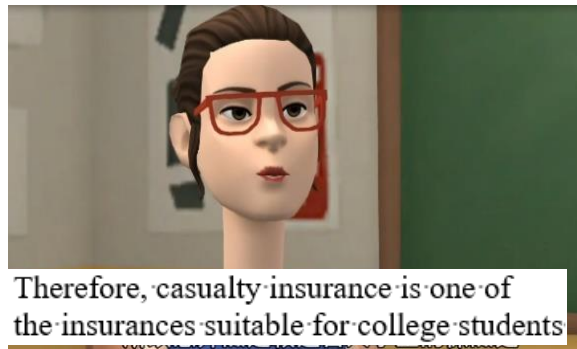


Figure 12: Explaining casualty insurance

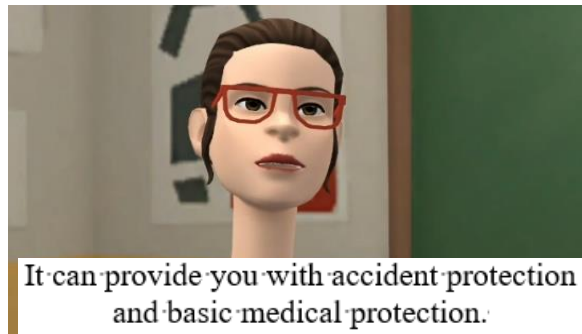


Figure 13: Explaining the medical protection of casualty insurance



Figure 14: Explaining claim limit



Figure 15: Explaining claim settlements