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INCORPORATING 3D SOFTWARE IN THE CREATION OF EDUCATIONAL COMIC BOOKS TO BOOST FRENCH READING COMPETENCE

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Abstract

Developing an educational comic book using 3D software has the potential to enhance the French reading comprehension learning process innovatively. This research is performed to develop a learning media to support the learning process by incorporating 3D-based software. Therefore, the main objective of this research is to describe how the process of educative comic book development supports French reading comprehension learning activity using the technology of 3D Software. This research is done by conducting an R&D research method which consists of a combination between the learning media development method by Sadiman and comic book creation by Tremblay. The result of this research is a creation of an educational comic book based on CECRL level A2 for the reading comprehension learning process, according to the experts that evaluated the media, this comic book is properly to be used to boost the student's motivation and learning process. Through this research, we hope to provide insight into the potential of using 3D software to enhance language learning and encourage further exploration in this area.

Keywords: 3D software, Comic book, Computer-generated imagery, French language comprehension reading, Learning media.

1. Introduction

The development of educational comic books using software has the potential to enhance reading competencies uniquely and engagingly [1-11]. By combining the visual and interactive elements of 3D technology with the narrative structure of a comic book, learners can actively participate in the learning process and more fully immerse themselves in the content [12]. The use of comics in the classroom should improve students' understanding of the subject and allow them to review the information taught. Comics can play an important role in encouraging students to read and develop appropriate vocabulary. Without much help, the student can see for himself the shape and description of something. The comic helps students learn French with a simpler perception.

Long-term memory and memory of students are significantly enhanced by the use of comics in the learning process [13]. Besides being an effective way to get readers interested in reading, using comics can help students build their vocabulary and understand the information they are learning. Thus, it is hoped that reading comics can help students [14]. Specifically, it gives learning the A2 reading comprehension level.

Based on the above identification, we formulated the following problem: how is the process of an educative comic book development to support French reading comprehension learning activity by using the technology of 3D Software? Then, based on the formulation of the problem above, the research objective achieved is: Describe how the process of educative comic book development supports French reading comprehension learning activity by using the technology of 3D Software.

2. CGI Comic Book to Boost French Language Reading Competence

Images in a comic are interpreted as static images arranged sequentially and interrelated between one image and another to form a story. Computer-Generated Imagery (CGI) comics are a type of digital comic that utilizes computer graphics and animation techniques to create visual elements. This can include everything from character designs and backgrounds to special effects and dynamic panel layouts. The use of CGI allows for greater flexibility and control in the creation process and the ability to incorporate interactive elements and multimedia content.

2.1. Comic book creation

In the creation of comics, the author must have ideas. To find the necessary ideas, the author can follow the four steps:

(i) Think of a short story idea that would work well visually
(ii) Work out the rough structure of your comic.
(iii) Write brief personality profiles of your main characters.
(iv) Think of extraordinary settings and strong emotions

The comic book writer should pay attention to the four aspects while creating the comic as mentioned below:

(i) The work must tell a story
(ii) The colour has to be there for a reason
(iii) Include movement to add extra depth to the storyline
(iv) Expression is key

In the process of CGI comic book creation, there are some advantages and limitations. One of the main benefits of CGI comics is the ability to create highly detailed and realistic visuals. However, the production of CGI comics can be time-consuming and require a certain level of technical expertise. Despite this certain challenge, many creators and readers have embraced CGI comics as a way to push the boundaries of the medium and create unique and immersive experiences.

2.2. Comic books to boost reading competencies

Comics are a form of artistic expression, it is used as an attractive easy medium for knowledge learning, help to enjoy learning, and increase learners' abilities in the educational process. Comics are widely used in the teaching process thanks to the diversity of their elements, their authors, or their subjects, but also, to their powerful cultural richness and continuous artistic richness which it shows. Comics can be used as a support in learning reading comprehension using the PQRST (Preview, Question, Read, State, and Test) method [15]. The process of implementing this method is as follows:

(i) Preview, in this step the teacher shows the image related to the topic they are going to learn to activate their prior knowledge. The teacher asks the students what is the first thought that comes to mind about the picture.
(ii) Question, the teacher develops questions to which the students want to find answers. This question arises out of curiosity after reading in general.
(iii) Read, the teacher asks the students to read the comics and if there are any difficult words, the students should write down the words, and then the teacher will discuss them with the students.
(iv) State, the students are asked to make a summary of the comic which they have carefully read beforehand. Of course, this summary should be in their language the teacher chooses one of the students and asks him to present his work in front of the class.
(v) Test, the teacher checks that the students understand the comic they have read. The teacher can test them by asking questions related to the illustrated story of the comic.

3. Research Method and Software

The method used in this research is the research and development method, a method used to create a certain product and test it. Specifically, the research and development method are a systematic method in the process of design, development, and evaluation to build an empirical basis for the creation of educational and non-educational products.

The learning material development process is divided into six main steps as follows: (1) Needs analysis and learner characteristics. (2) Planning Training Objectives. (3) Material planning. (4) development of learning assessment instruments. (5) Media Creation. (6) Media evaluation and review.

The data sources in this research are collected using some research instruments. We ask questions to learners and teachers to obtain data that supports the process of developing the comic for learning French reading comprehension level A2.

The software that is used in this research is mainly 3D-based graphic software such as VRoid Studio to facilitate the character creation and Blender 3D to process 3D imagery to make the illustration of the comic book. 2D image processing software is also used such as Photoshop and Clip Studio Paint.

After the production stage, the product is evaluated by experts. We use questionnaires in the form of an evaluation sheet to know the relevance of the product according to CECRL.

4. Results and Discussion

In this section, the development process of educational comics as learning media for French reading comprehension level A2 will be explained.

4.1. Preparation stage

This stage is the initial stage of the development process divided into several steps as follows:

(i) The analysis of Teacher and student needs, in this step we interview French reading Comprehension level A2 Teacher and distributed the questionnaires to the students to obtain information of their needs.
(ii) Formulating the media, after obtaining the information, we then formulate what kind of learning media that would be developed, in this case, an educative comic book is decided to be made.
(iii) Learning material planning, we gathered information from various sources to elaborate learning materials to be integrated with the comic book

4.2. Creation stages

After the process of comic book conception and the preparation of the narration, then the research process continued to the creation stage. In this stage, we commenced to do the following steps;

(i) Conceptualization. In this step, the author defines the message to convey. The author concepts what he wants to say or the message that readers will remember. We as the author of the comic on this occasion want to pass on messages that learning a language skill, particularly reading comprehension can be done in a fun way. We can enrich our knowledge of a certain theme or topic, in this case, the cultural topic, particularly the culinary topic, by reading comics.

(ii) Scenarization. The narration is as important as the images in a comic. In this step, we wrote the overall narrative, for example, the events that will happen in a comic book story. The author can also add dialogue to reinforce the narrative. In the development of this comic book, we prepare eight scenarios on French cuisine. Prepared scenarios are simple and less complicated, we focus on the creation of the scenarios on the culinary experiences of the two characters during their visit to France.

(iii) Character creation, The creation of comic characters. In this step, the author designs and creates the appearance and behavior of the characters that will appear in a comic. The majority of the main characters that appeared in this comic are adapted according to the characteristics of the learners. We created four main characters for this comic. All the main characters are students. Character designs are present in the character design sheet form as follows (Fig. 1).

Fig. 1. Character design sheet.

In the process of character creation, we use an application called "VRoid Studio". This application is easy to use, the users can simply create the characters they want. Characters created in this app can be used for any purpose without limitation. The users can create the desired characters using the available resources or the resources they add (Fig. 2).

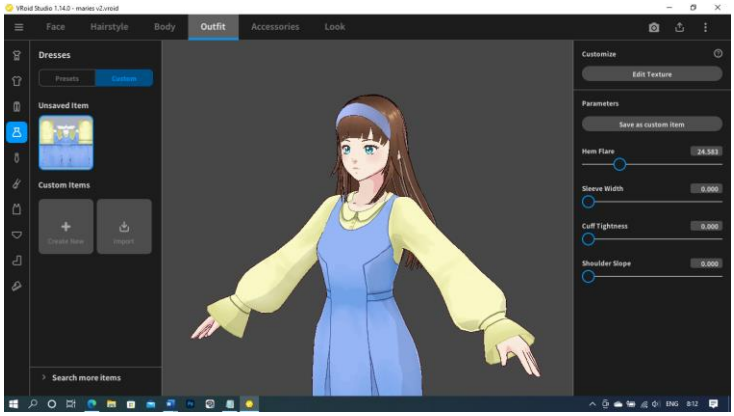

Fig. 2. Character designing process in VRoid Studio.

After creating the characters needed for the comic, we convert the 3D models so that they can be used in other applications for storyboarding and scene creation purposes.

(i) The creation of the storyboard. Once the narration is established, the author can start converting their narration into illustrations in cases or vignettes. In this step, the author can also decide on the dimensions of the boxes. This step can be done on paper or a computer. When creating the storyboard, we draw

some rough drafts of the scenes that may represent ideas or events in the story of this comic. Once the 3D models of the comic book characters have been converted, we can use them in Blender. In this application, we can move the characters into certain actions or expressions as needed in a scene in the comic, and then we render the scene so that the images can be saved (Fig. 3).

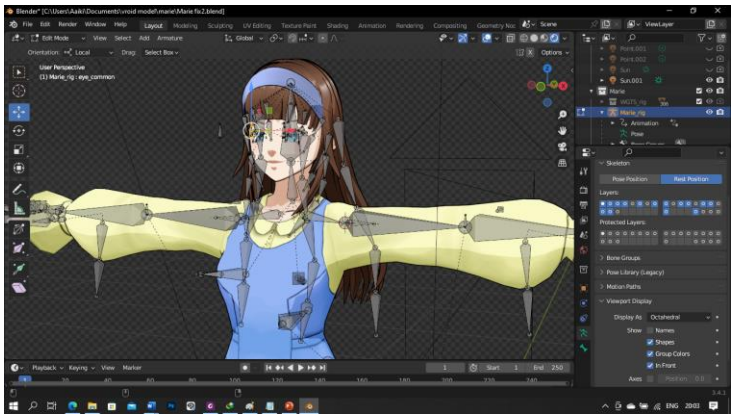

Fig. 3. Adding armatures to animate the model.

As the storyboard is a rough representation of a comic book scene, we did not add the background this time. We then make the rough layout of the comic strip using the storyboard that has been made. The layout creation process was done using Clip Studio Paint (Fig. 4).

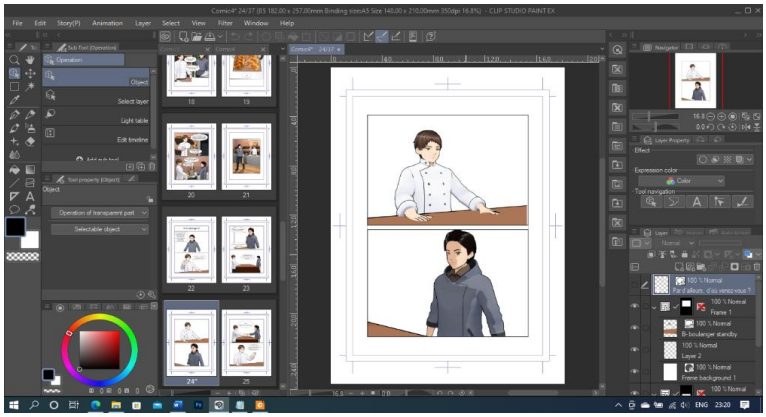

Fig. 4. Storyboard creation process.

(ii) Detailing, After the layout of the panels in the storyboard process, we refine the scenes of the comic. The panel refinement process was done in the Blender application. We added a few elements that can support the telling of the comic's stories, such as backgrounds. Backgrounds can enhance scenes, they also tell the reader where the scene is happening. The next element we adds is lighting, it can enhance the mood of the scene. Another element that has been added in this step is the properties. Properties are the things the characters interact with, they can emphasize the action of the characters in the comic (Fig. 5).

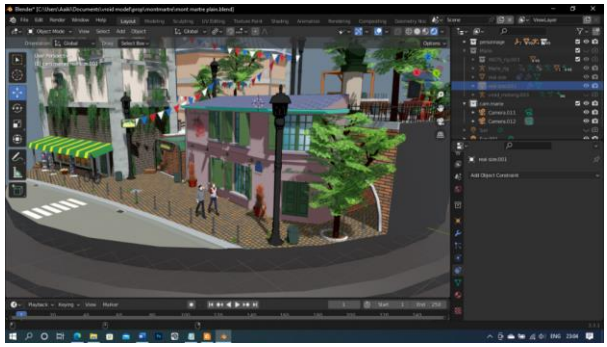

Fig. 5. Adding details to the image using Blender.

After adding some details, the detailed illustrations are used to replace rough illustrations of the panels (Fig. 6).

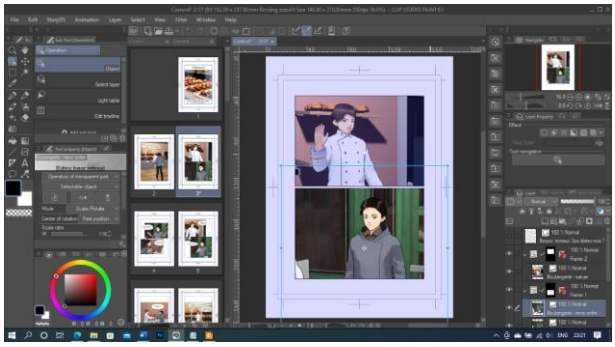

Fig. 6. Inserting images with details to the panels.

(iii) The author emphasizes the lines and details of an image using pens or nibs. The artist strengthens the drawn lines by tracing them. The artist can also adjust the line density to define each detail, important or major details are often drawn in thick lines and vice versa. Unlike the inking method, we use a different approach to outline. We did not draw the line of the sketch, but we use a simple procedural step to create the outline in the Blender application. The outline thickness and colour of the images can be adjusted easily as needed with this application (Fig. 7).

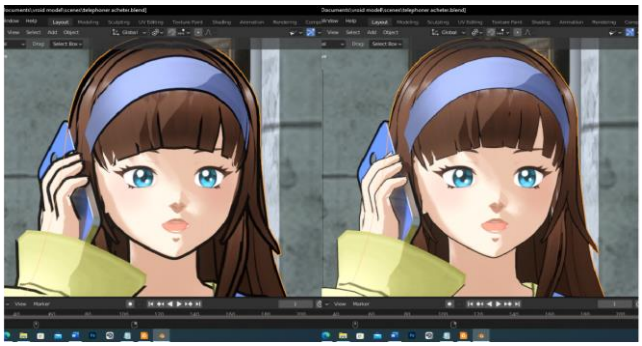

Fig. 7. Adjusting the line thickness of the illustration using Blender.

(iv) From the designs that are inked, we as colorists can colour the images to make the images more interesting. In this step, the colorist should pay attention to the style of the comic art, sometimes the colorist adds light and shadow to the drawings if necessary. The colouring in this image process can be done simultaneously or after the above process as needed. The colouring process is done using two applications based on the result desired by the researchers. In this case, we use Photoshop for the pre-elaboration colouring process and Clip Studio Paint for the post-elaboration colouring process. To mimic the looks of the comic book, the customized Cel Shading technique is used in this colouring process (Fig. 8).

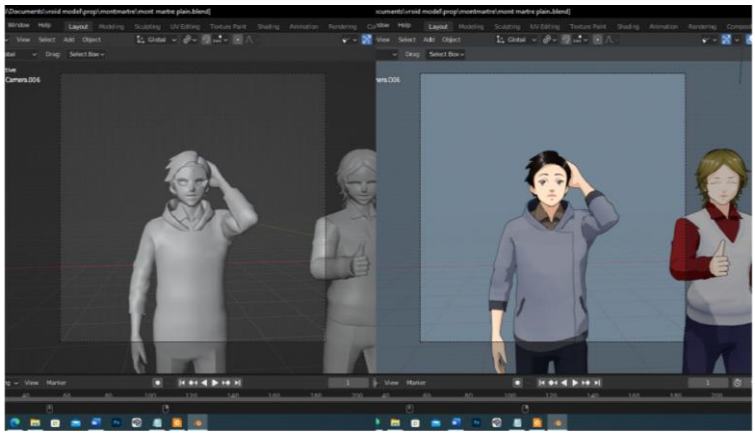

Fig. 8. Colouring process with customized Cel Shading technique.

(v) In this stage, the author adds the texts and the dialogues which can reinforce the images of the comic strip. Texts and dialogues are added in available spaces, for example, spaces in speech bubbles, recitatives, and white spaces for onomatopoeia. In this process, we put the dialogues mainly in a combination of round and elliptical bubbles with the tail pointing toward the speaker, and the narration in a rectangular box to differentiate these types of texts. The lettering process was done in Clip Studio Paint (Fig. 9).

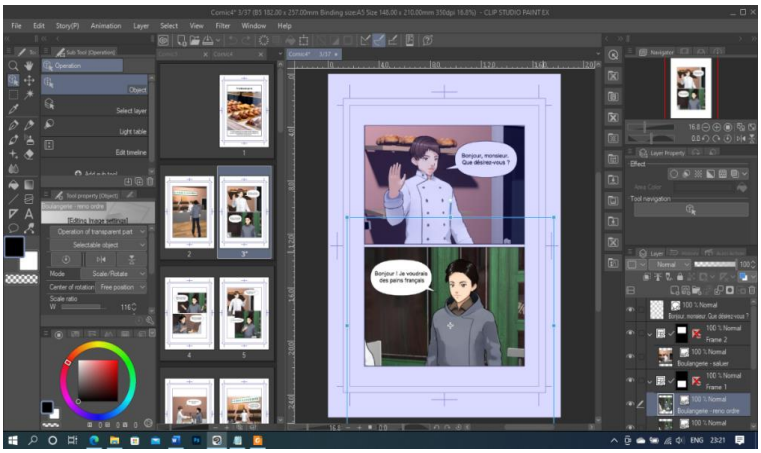

Fig. 9. Lettering process.

4.3. Finalization stages

After the comic book is successfully created, the media is then finalized by doing the following steps:

(i) Asking some experts in the related field to evaluate the media, in this case, we asked for the assistance of an expert in French language learning and an expert in art and illustration to evaluate the media.
(ii) Doing revisions, after the evaluation process, we then make certain revisions based on the experts' reviews of the created media.
(iii) Final products, this is the final step of the development, the final product of this research is an educational comic book as depicted in the Fig. 10.

Fig. 10. Finalized product.

5. Conclusion

After the detailed explanation of the development of the comic strip for learning French language reading comprehension at level A2 with the aid of several 3d software. We conclude the research findings in this chapter to answer the research question. First is how to develop this media. In the process of developing this media, we use the method of learning media development. The development process begins with the analysis of the needs of learners and teachers. Once the analysis process is complete, we plan to learn materials based on the level of the learners and the CECRL standard for level A2. Shortly, after the prepared learning materials were ready, we started working on the comic book creation. The comic elaboration steps used in this process are as follows:

(i) Conceptualization, in this first step, we decided to deliver on the culinary experiences of the characters as learning material for learning written comprehension at level A2

(ii) Scripting, we wrote the overall storytelling elements such as events that occur, dialogues that can enhance the storytelling, and then scenarios that contain the French culinary theme.

(iii) Character creation, Character creation consists of designing the character's appearance and creating the character's personality. In this development process, we used manga-styled 3D character creation software called VRoid studio to facilitate the process.

(iv) Creation of storyboards, in this step, characters created in VRoid studio are then converted to be used in a 3D software called Blender to make them articulated. Once the characters are posed in Blender, we then rendered the images as a scene for the storyboard. software called Clip Studio Paint is used to lay out the storyboard on a digital canvas.

(v) Detailing, the scene refinement process is done after the rough layout. We then began to refine the scenes on the storyboard, some details are added to the scene such as the sets, the background, lighting, and props, to enhance the storytelling. This process is done in Blender and Clip Studio Paint like the previous step.

(vi) Inking, the outline creation process in this comic is done procedurally with a simple step in Blender. The outline thickness and colour can be adjusted freely.

(vii) Colorization, this colouring process is done simultaneously with the inking process and the detailing process. This step is done in Blender and Photoshop.

(viii) Lettering, Lettering is one of the final processes in the development of comics. In this step, we add text that emphasizes the narration of the comic. Text added in a balloon with a tail can be shown as the character's speech in a panel.

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