



Desktop Application Learning System: Multimedia Interactive Learning Online (MiLO) for Teaching and Learning Tool for Hotel Front Office Management

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Abstract: The rise of learning innovation suggested that distance learning includes the use of technologies such as video, audio, computer, and multimedia communications to support extended teaching and learning. However, despite an increasing number of learning innovations, there has been little detailed documentation of the processes involved in this format for the animation production process. More specifically, there has been little documentation and analysis of practitioners' key considerations and issues when integrating 3D animation production process with teaching and learning tools. This study aims to examine the 3D animation production process of Desktop Application Learning System: MiLO. The Kemmis and McTaggart Action Research Model is adapted for the purpose of this study while utilizing the qualitative method of analysis in developing the 3D animation desktop application for teaching and learning. The findings of this paper proposed a new framework of the animation production process for teaching and learning applications using the iClone software. This study has also provided a new framework in the animation production process that can be applied in teaching and learning either for researchers or designers alike in various fields. Hence, this study aims to bridge the learning gap between studying from textbooks to interactive learning through using a desktop application.

Keywords: Desktop application, MiLO, 3D animation, front office, action research

Received: 21 March 2019; **Accepted:** 3 May 2019 ; **Published:** 21 June 2019

INTRODUCTION

Development in online and interactive learning methods have shifted the enclosed classroom to the virtual setting allowing lessons to be conducted from various distances. According to [Aburahma and Mohamed \(2015\)](#), the tools used in traditional teaching and learning are often static, unchallenging, and at times boring, especially when compared to educational virtual games which are considered as active sources for learning. It was imposed by [Raiyn \(2014\)](#) that

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interactive teaching is initiated with the philosophy of integrating technology into teaching and learning which activate a new process of interactive communication. Importantly, the use of technology enables students to develop knowledge and concepts while prompting them to create greater interaction with the lecturers (Gomez & Gomez, 2018; Grant & Thornton, 2007; Haris, 2017; Mueller, 2017).

However, it has been cautioned by Tuparov, Dureva-Tuparova, and Peneva (2004) that computer-based learning should not only focus in providing state of the art content but importantly, the content should be synchronized with the learning objectives. The Faculty of Hotel and Tourism Management at Universiti Teknologi MARA (UiTM) offers the Front Office Management subject for its students which requires them to develop certain functional skills in the industry. Among the basic communication skills that students need to develop is interacting with hotel guests while taking on various tasks such as guests registration, inquiries, requests, managing special arrangements, and handling payments. The front office team is a key component in the running of a hotel since they are the receiving members as guests arrives to the hotel, giving the first impressions of its services.

A lot of activities included in the subject involve practical industrial tasks that supplement all theories from the textbooks and references. It has been suggested by Woo, Shahril, Azmi, and Rosli (2018) that educators are encouraged to shift from teaching with the conventional methods to applying more interactive learning methods by tapping in technological advances in education. Hence, this study aims to bridge the learning gap between studying from the textbooks to interactive learning through using a desktop application. In the other hands, according to Ward (2006) suggested that, critical thinkers and practitioners in animation studies in the time of transition from material to virtual media, has not been followed up by other researchers. Darley (2007) noted that there was a lack of research in many aspect of animation. These observations strongly suggest that research and research methods have not been fully developed for animators in field. This research aims to examine the 3D animation production process of Desktop Application Learning System known as MiLO by adapting the (Kemmis & McTaggart, 1988).

LITERATURE REVIEW

The animation production process by Selby (2013) contains three phases namely the Pre-Production, Production and Post Production stages. Figure 1 demonstrates the Pre-Production Phase that include the establishment of idea and concept, scripting, storyboarding and 3D modelling. The second stage is the Production Phase which involves preparing the design for a project. The process starts with texturing and shading, animation setup, character rigging, particles and FX (effect), animation motion, lighting, camera setup and rendering. Finally, the Post-Production Phase encompasses composition, video, and sound editing process. This is a common process of animation project used in every animation or film.

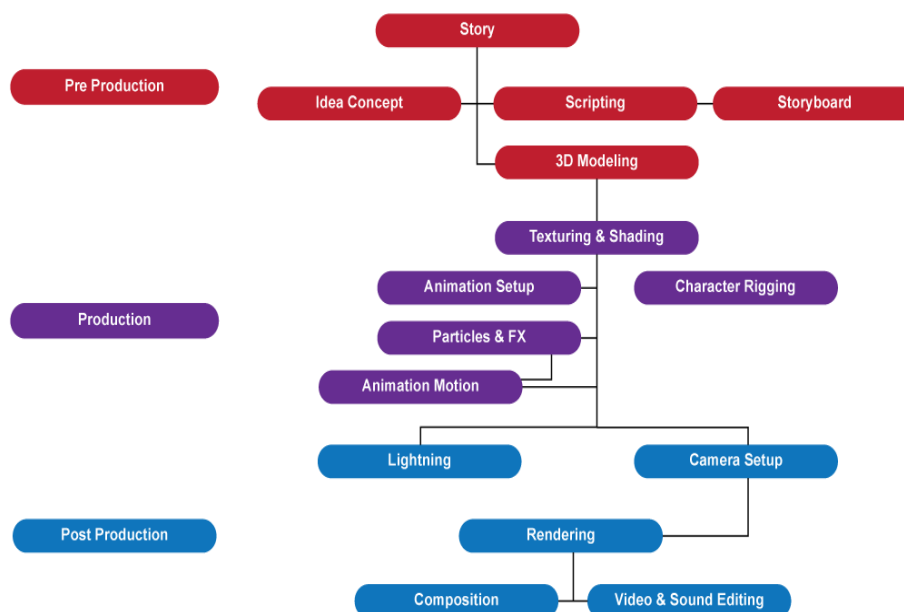


Figure 1 3D Animation Production Process (Selby, 2013)

Nevertheless Scaramozzino (2018) described that the process is generally broken down into three distinct phases

Pre-production, Production and Post-production and each of these stages comprised of a few distinct steps. Each one of these steps requires special talent, software and equipment.

Pre-Production

The process of producing an animation is laborious and it requires appropriate planning as thoroughly described by [Selby \(2013\)](#). An animation would usually start with a written script which may be as simple as a brief, and may be based on an observation, an exposition of an event or an adaptation of a story. Content of the script would have to go through comprehensive analysis and editing by a group of panels who will need to have a consensus of the final script before it goes to the next phase in the production process. The next stage would require the animation director to instruct the crew involved to interpret the script visually and aurally to get more tangible basic concept and idea. Subsequently, the concept would be further explored and developed which should lead to rendering rough visual and aural forms of the preliminary ideas. Subsequently, the ideas are further explored through more focused and fluid research and collecting information through various methods such as; observations and recording, and assembling collected materials in systematic order to be used for the studio. These materials would also be applied to add more characteristics and expressions of the preliminary ideas. Once the necessary preliminary materials have been appropriately developed, the project could be pitched to clients or funding bodies by presenting a written synopsis known as treatment.

In this phase, the story or idea is summarized through a presentation which may comprise of the combination between a written statement, visualization, storyboard, temporary soundtrack, sample voice-over, graphic effects. The production method of creating an animation will only consume when all the presented materials get the approval by those involved along with the stipulated budget which would influence the release format of production. Importantly, the storyboard would also be developed during the Pre-Production Phase which would give some details of the narrative through juxtaposed illustrations, some background information of characters involved, establishing where dialogues would fit with actions, camera positions and movements, and sound effects. Consequently, the storyboard would also be further developed as it would provide some background illustrations of the set, and more specifications would be added to the descriptions of characters in tandem with collected research components as the illustrators and animators work out methods to animate the details included in the storyboard. The final step in the Pre-Production Phase also involve selecting the appropriate sound effects, dialogues, narration, and special effects are finalized for design concurrently with the visual development. Additionally, a musician would be needed if special music score is used in the production, auditions for voice talents would be held for any voice-over roles. Also, any special and relevant sound effects may require the special effects crew to compile various sounds either in its natural environment or in the studio which would go through the sound-mixing stage to form soundtracks or sound effects.

Production

The second phase of the animation process is the Production Phase and it needs to be emphasized that the process of 3D animation which is employed for the purpose of this study differs from the steps taken from the production in 2D animation. The 3D animation begins with modelling a character or object which is sculpted and formed through developmental illustrations and groundwork so it meets the creators original vision.

Subsequently, the groundwork would then move into the rigging and animating stage to define the modelled form's movements. This can either be done manually or digitally by the animator. The manual movement would require the animator flexing the forms frame by frame while digital movement would use the software applications and commands to move the forms on an established axis such as walk-cycles, lip-syncing, and any other movements involved.

The next crucial stage of the Production Phase involves the effects and lighting process to elucidate central movements of the forms which will be looped; a process of producing the same movement repetitively and recorded for use in various frames. Every animated movement will be concurrently worked on with the lighting design to create the intended atmosphere on aspects of the form for dramatic purposes. The compositing stage during the Production Phase is the process where all the prior recorded 3D elements are coordinated and merged, manipulated and fabricated to alter the feel and attributes of the recorded footage. This is performed to maximize the dramatic impact and give focus towards the story or idea more appealingly for viewers. Once all the prior stages have been completed, the layers in the frames would be flattened during the rendering process to create the final animation structures. Finally, the work print process would be performed to ensemble the special effects, music score, narrative and dialogues in the animation.

Post-Production

The Post-Production Phase will take all collected animation and recorded materials to be synthesized into a product, adding special effects and titles for release and distribution. The inclusion of special effects in the concluding stage is usually used to accentuate and enhance the audiences viewing and audio experiences. It is necessary to incorporate the appropriate sounds into the various landscape of the visuals to evoke some form of realism into the animation. Essentially, colour correction and mastering must be executed to fine-tune and remove any animated inconsistencies to achieve seamless and unadulterated visual and audio experience.

Presenting the title and credit is an essential stage to acknowledge all the crews involved in the production process for release and distribution.

RESEARCH METHODOLOGY

A tedious animation production process can be cut down with a new software and this practice-led project adapted [Gray and Malins \(2016\)](#) approach. The two researchers expounded that the practice-led method can be considered as a 'naturalistic inquiry' that embeds the researcher firmly within the research process and positions the emergence of problems, questions, and challenges as they occur within the creative practice.

This practice-led study employed reflective practices across a series of cycles in the development of the 3D animation process for the desktop learning application. The method provides a means for discovery of new knowledge in the 3D animation video produced as part of a teaching and learning tool. Ultimately, it should provide insights in the evolution of creative component and ensure that new questions, problems, and challenges encountered during the animation production process of the project are documented for future development and studies. The research project consisted of three interactive cycles of practice, which adapted the Kemmis and McTaggart Action Research Model as demonstrated in [Figure 2](#). This method involves four phases: Developing a Plan, Actioning the Plan, Observing the effects of the action and reflecting on these effects ([Kemmis & McTaggart, 1988](#)).

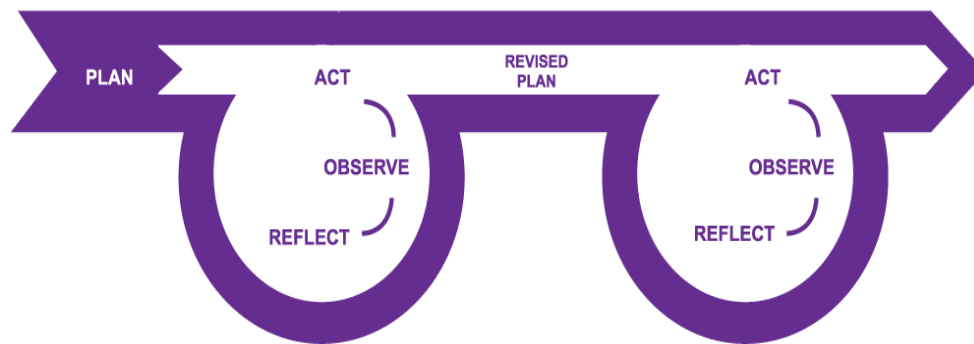


Figure 2 *Kemmis & McTaggart Action Research Model* ([Kemmis & McTaggart, 1988](#))

According to [Kerlow \(2009\)](#), each cycle in Kemmis and McTaggart Action Research Model constituted the stages involved in an animation production and are interconnected with the segmental phases of Pre-Production, Production, and Post-Production. Accordingly, the design of this study meets the general phases of an animation production.

The phases of the latter Model of Action Research cycles may be adapted as the following and is illustrated in [Figure 3](#):

- i Development of a plan - Pre-Production Phase
- ii Actioning of the plan and the observing of practice - Production Phase
- iii Reflection on outcomes and observations made during production - Post-Production phase.

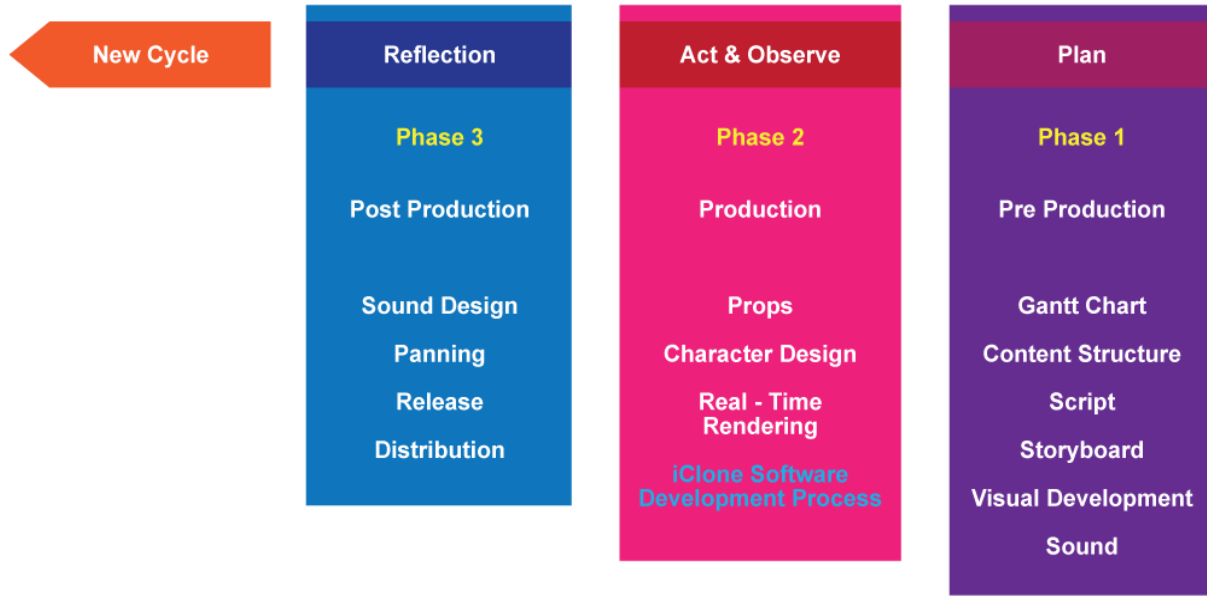


Figure 3 Conceptual Design of the Research Cycles

RESULTS & DISCUSSION

Plan Phase (Phase 1)

From the Kemmis and McTaggart (1988) action research design, this study has developed a detailed plan for the cycle within the Pre-Production Phase. The development of the project started with outlaying the plan in the Gantt Chart as shown in Figure 4. Development of the project is scheduled in a timeline to achieve its target of completion within three months of producing the 3D animation for the desktop learning application MiLO.

The Gantt Chart is then break up into three phases from September to November that started with the schedule and continued to the content structure. The content structure is a process of dividing the Front Office Management subject according to the main topic as shows in Figure 5. The subject has four main topics namely; reservation, reception, bell service and cashiering. The 3D animation video is produced according to these main topics. Furthermore, the script for every main pic had been developed with descriptions of the characters, setting, and plot. The main events such as that in the reservation topic will be simulated in the animation and details of the atmosphere at the front desk of a hotel will be illustrated. The script provided details and specifications of the characters, setting, and plot of the story so that visualization can be developed in the storyboard to provide more direction of the animation at the next stage.

MONTH	PHASE 1	PHASE 2	PHASE 3
SEPT 2018	Content Structure, Script, Storyboard		
	Visual Development, Sound (content)	Props	
OCT 2018		Props, Character Design	
		Character Design	
NOV 2018		Real - Time Rendering	Sound Design, Panning
			Release, Distribution

Figure 4 Gantt Chart - Development of 3D Animation for Desktop Application MiLO

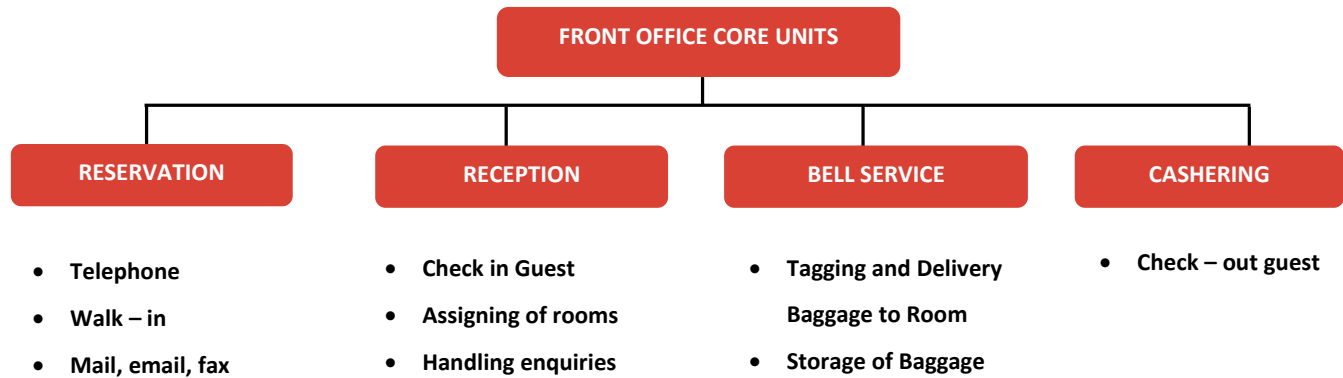


Figure 5 Content Structure of Front Office Management: Four Main Topics

Preparation of the storyboard would usually begin by drawing squares of frames on plain paper and sketch out details of the setting, time of day, and ambiance for the scene. The characters dialogues and actions should also be illustrated and noted in the storyboard.

Meanwhile, Figure 6 provides the visual development process of identifying the tone, mood, and colour scheme, for all the characters, environment, clothes, and objects in an animation. In this desktop application project, the colour and mood are identified by observing actual atmosphere and events in the hotel setting. Besides from working on the visual development process, a mock voice cover of a male and female character was first recorded to be used as draft voices. This would assist the creators to manage and control the length of the 3D animation video accurately within the 2 minutes set. The mobile sound recorder had been used in this process as WAV sound format.

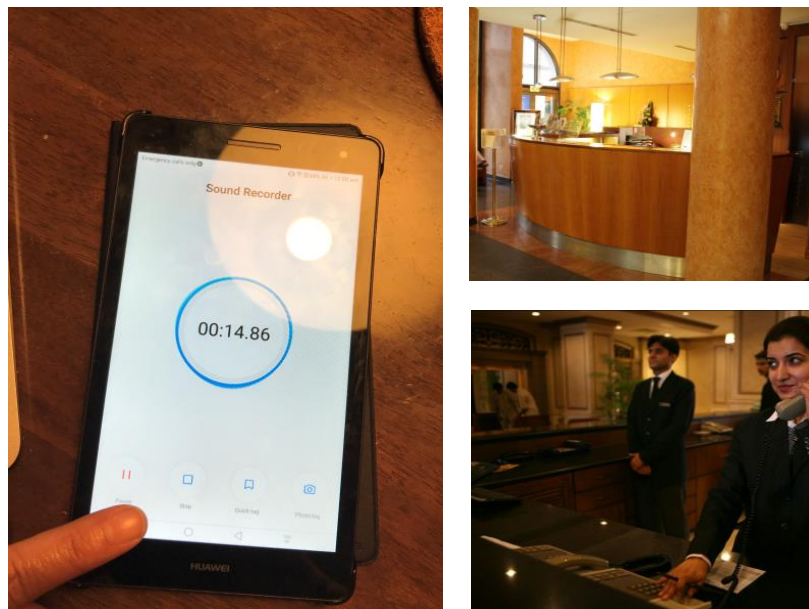


Figure 6 The Visual Development and Sound Recording Process

Act and Observe Phase

Phase 2 which is also known as the Production Phase continues with the prop design development stage. All the props and character design are developed by using the iClone Software which is a real-time 3D animation and rendering software that enables users to make 3D animated films. Real-time playback is enabled by using a 3D videogame engine for instant on-screen rendering. It is a user royalty-free for all of its content allowing users create with the software, even when using the Reallusions software assets library. In this process, all the prop and characters are made available in the drag and drop menu.

The 3D workspace, basic scenes with sky, building blocks and texture can be created according to the mood of light which may also depend on the storyline. Importantly, everything can change, adjusted according to the plan. The content library body style also allows the creator to modify any modelled forms according to specific sizes. For the

purpose of this project, the animation used male and female characters with appropriate dress code according to the real situation in a hotel front desk area as portrayed in Figure 8. Additionally, the iClone video editor is also the timeline according to sequence. The motion, movement of characters are then composed to create a movie clip which is then proceeded to the director mode section. The characters are recorded according to camera angles as illustrated both in the script and storyboard at Phase 1. The director mode is introduced in this study to allow the animator have control over the characters on screen like a virtual reality game, while movement can be customized while ultimately create characters with smooth movements. Generally, the basics of animating objects are the same as the keyframes, picking a bone, inverse kinematics and motion paths process (Patmore, 2003). The rendering process is very quick since it is a real-time rendering process as shown in Figure 7.



Figure 7 *The Prop, Character Design Development and Real-Time Rendering*



Figure 8 *The Reservation, Reception Scene, The Bell Service and Cashiering Scene*

Reflection Phase (Phase 3)

The Reflection Phase, could be considered as a production within the Post-Production Phase. In the production process, the sound design and panning process is prepared.

Panning is putting out the sound in a different landscape of the visual. In this process, the reference of real-life situation sound in the hotel ambiance needs to be applied for the 3D animation video. The mood and real situation managed to be produced following a few references while background music had been applied to suit the event. As the dateline was nearing, the editing process was performed by composing the video to match with the voice over and background music. In this phase, synchronizing sound requires the creator to choose the appropriate software for editing process. All the footage had been exported into the iMovie Figure editing software to organize the audio to be inserted for the selected scenes. The sound editing is performed separately to ease the cutting out of a few frames from the scenes while making it suitable to the voice that had been recorded earlier, using the mobile phone voice recorder application. In this phase, all the sound will be mix until it is final. The background sound for the ambiance, foley and voice will be composed and mixed as it produces effectual sound effects. The final scene is eventually finalized with the appropriate medium for release had been identified.

Significantly, the process of the development for this project continues with a script-free programming tool that allows users to create video games or other interactive software using a range of graphical user interface tools known as Clickteam Fusion. All the videos were attached with the interface design that had been created by a graphic designer, and it is ready for a prototype release and testing for students. It has been highlighted at the beginning of this paper that there is inadequate documentation produced with regard to the animation production process. Through Kemmis and McTaggart Action Research Model, the process of animation production could adapt the process in the conceptual design of the research cycles. The association of every phases is essential in ensuring that the production deadline is met in accordance with the development timeline while keeping the production process systematic and manageable.

Figure 9 demonstrates the connection of the three phases that was achieved from the exploratory animation production process which begins with Phase 1 known as Pre-Production, then continued with Phase 2 of Production, and subsequently completed at Phase 3 or known as the Post Production stage. As a result, a new framework had been produced in the animation production process of this project.

CONCLUSION AND IMPLICATIONS

Through the conceptual design of the research cycles of Kemmis and McTaggart Action Research Model, the present study identified that all the stages can be adapted for the development an exploratory animation production process as revealed in Figure 9.

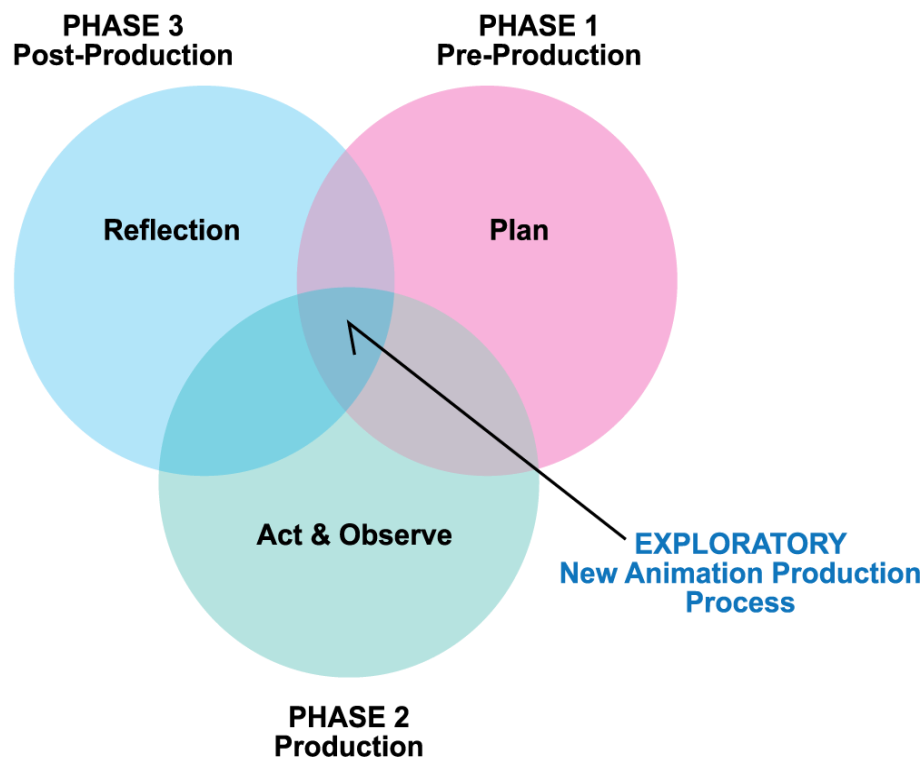


Figure 9 Exploratory Animation Production Process Adapting from Kemmis & McTaggart Action Research Model

As mentioned by Swann (2002), it is an appropriate methodology for any design project where the final outcome is undefined. Besides that, application of the action research design involves problem solving thus, opening the path to expand a project because sequential stages, of planning, execution, observation and documentation enable the process to be personalized. This has been demonstrated in the development of the desktop application teaching and learning tool of this study; therefore, future researchers may consider adapting similar process for other projects. Importantly, the present project also aims to explain the 3D animation production process of the Desktop Application Learning System Multimedia Interactive Learning Online which is known as MiLO. In conclusion, a new framework had been produced by adapting Action Research Model by Kemmis and McTaggart (1988) which subsequently accomplished the development of an exploratory animation production process cycle that can be applied to other animation project, especially in developing short 3D animation.

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