

# Study on the Development of Animation Imagination Rating Scales and the Learning Model

Shih-Yang Yang and Chin-Chun Huang

**Abstract**—The purpose of this study is to explore the animation imagination rating scales and the learning mode, and the study objects are students from Vocational and Technological Colleges and Universities, using survey research methods during the study processing to develop the tool of imagination rating scales through animation, literature on the subject of imagination, and consulting with professional. The study objects consist of total 358 students, more than a dozen of classes, major in Study Area of Design, Departments of Animation, Television and Film, from the regions of North, Middle, South and East Taiwan. After they fill out the Animation Imagination Rating Scales, the data will be collected in the Structural Equation Model to establish a Relation Model between variables. The study has concluded: the Animation Imagination Rating Scales and the learning mode contain four factors of Fictions, Themes, Technical Design and Value Probability, which respectively has several sub-items, the factor Fictions including Sources of Motives, Fiction and Imagination and Problem Solving; Themes including Story Structure and Storyboard Design; Technical Design including Lighting and Sound, Characters and Background and Dynamic Development; Value Probability including Value Orientation, Self Value and Value Establishment. The learning mode of animation imagination contains two paths, the first one from Fictions, Themes down to Value Probability; the second, from Fictions, Themes down to Technical Design.

**Index Terms**—Imagination, animation imagination rating scale, learning mode, vocational and technological college and university

## I. MOTIVES

Imagination is a thinking process in human nature. Expectations and thoughts in your brain can be depicted during the thinking without limits to mental activities and iconic ideas. Human creativity and invention can come to existence through imaging, further, science and society can be developed and accomplished. In spite of imagination's importance to human mental development, it has not made many results in past researches compared with others such as critical thinking, problem solving, and creative thinking. The past researches on imagination tended to focus on the fields of philosophy and literature, for instance: philosophical thinking and discussion with an aim at the nature of imagination, subject studies on the imagination during the process of literature creation; animation performance lacks of discussion in arts, either [1]-[6]. For

the field of education, there have been less systematic researches; even there are some, most of them aim at the studies on young children's imagination. Usually, older students, particular college students, are not the study objects. This study is the research subject of 2010 Research Project, the National Science Council of Taiwan – Imagination Training and Evaluation of animation teaching in Vocational and Technological Colleges and Universities, which will supplement the shortcomings of the researches mentioned previously. We will stress on the rating scales of animation imagination development and the establishment of learning mode to work on verification and evaluation for future reference to those students in Departments of Animation, Television and Film, Vocational and Technological Colleges and Universities, for the purpose to inspire their animation imagination.

## II. PURPOSES

The purpose of this study is to explore the “Development of Animation Imagination Rating Scales and the Theoretical Model” that can develop the Rating Scales to evaluate students' animation imagination, and guide them to show their talents and accomplish individual creation of animation imagination by using their imagination. Specifically, the purpose of this study makes students as the study objects, who major in Departments of Animation, Television and Film in Vocational and Technological Colleges and Universities that will develop the Animation Imagination Rating Scales, and establish the “Learning Mode of Animation Imagination”.

## III. LITERATURE ANALYSES

### A. Connotation of Imagination

Imagination performs the function to have everything symbolized that it is capable of getting something unseen to be integrated and symbolized through these mental processes of perception, symbol structure, memory and reasoning [7]-[9]. Imagination has four aspects: 1. Trigger for Imagination: imagination process is triggered by senses, no matter by vision, hearing, touch, smell or taste, you can imagine what a thing looks like when passing a place, entering similar experience of visual perception [10]; 2. Fiction of Imagination: imagination can be originated from a process of fantasy that makes a process spontaneously having vision and hearing of something in your dreams to form possible images, just as you feel some people, things

Manuscript received April 20, 2012; revised May 30, 2012.

The authors are with Kang-Ning Junior College of Medical Care and Management Taiwan (e-mail: lazoe@ms52.hinet.net).

and objects in front of your eyes very likely true owing to imaginative images [10]; 3. Combination of Imagination: imagination focuses on the activity of mental awareness toward non-existent things to perform a series of illusionary design and combination that will make a psychological form surpassing externality [11]; 4. Possibility of Imagination: imagination is a thinking activity to generate new images and concepts, in a result, it will create more new images for any possibility [11].

#### *B. The Rating Method of Imagination*

Imagination means new combination of old experience, encourage latest information from what you have known, and the ability of idea association with non-existent things that it can go free absolutely without restraint. Therefore, a French psychologist Binet had suggested as early as the beginning of 20<sup>th</sup> century, the imagination should be evaluated with open topics, such as the Test of Storytelling by Ink Blot to measure the imagination [12]. The evaluation approaches of imagination can be divided to quantitative and quality assessment. For example, quantitative assessment applies Test Paper, Rating Scale of Attitude and Inclination, Performance Assessment and Portfolio Assessment; quality assessment does oral assessment, observation assessment, Biography Scale, Presentation of Activities and Accomplishment, assessment by teachers, peers or superiors, and so on. Less rating scales focus on inner self-evaluation development for those who are imagining, particularly during the learning process of animation imagination. This study develops the Rating Scales of college students' animation imagination to measure the thinking of those who are imagining, whether they can be thinking free and unrestrained to establish the processing of inner psychological images that will set up a theoretical model for animation imagination thinking.

#### *C. Animation Imagination*

Animation consists of many motionless frames, played at a certain speed (for example, 16 frames per second). Continuous playback of the frames makes illusion due to visual afterimage that you mistake it for the work of action. To obtain the frames of action, there is subtle difference between every frame. There are Two- and Three – dimensional animation with extraordinary skills; however, they have two things in common: 1. The images of animation are produced to films or video tapes frame by frame; 2. The illusion of "Action" from the images, not originally being there, actually has been created and recorded by a video camera. We call these images "Action" as illusion, the best depiction. The "Animation" images neither make any action nor make live, if there are no movie projectors, or no video playback by electronic devices. The illusion of animation will exist only on a movie screen (or a monitor). Turning off the projector or playback system, the feeling of lives won't be there anymore [13]. The animation is not the arts of "Moving Paintings", but the arts of "Animated Action" [14]. Therefore, the future animation teaching should guide students to elaborate diverse imagination to make great dramas with particular depiction of characters, and provide infinite enjoyment in visual sense, more vividly and lively.

## IV. RESEARCH METHODS AND STEPS

### *A. Research Methods*

The study first adopts literature analyses of animation and imagination to explore the relationship between learning content of animation imagination, properties and influence. Next, a Survey Research will be adopted to develop the Rating Scale of Animation Imagination according to learning content of animation imagination, including Rating Scales of Fictions, Themes, Technical Design and Value Probability. Three hundred students who major in Study Area of Design, Departments of Animation, Television and Film, Vocational and Technological Colleges and Universities will take the tests of these Rating Scales. The results of Rating Scales will be sent to Item Analysis, Factor Analysis and Reliability Analysis for the relationship between variables that can measure the Rating Scales' reliability and effect. The data of surveyed students will be analyzed by the Structural Equation Model (SEM) to develop the Rating Scale Tools and the Path Educational Model.

### *B. Study Objects*

The study objects are selected from daytime students from the regions of North, Middle and South Taiwan, who have ever studied animation courses with a major in Departments of Multimedia Design, Animation and Game Design, and Media Arts. A Stratified Purposive Sampling Method is used to select the study objects that these Departments of Multimedia Design, Animation and Game Design, and Media Arts will be stratified to different layers, considering the proportion of classes in national and private schools around North, Middle and South regions ( $\text{Predetermined Number of Classes} / \text{Total Number of Classes} \times \text{Total Number of Classes in the department} = \text{Department Purposive Sampling Number of Classes}$ ); therefore, the purposive samples are ten classes of 358 daytime students to take the tests of Rating Scales.

### *C. Research Tools*

The research tools have these rating scales of Fictions, Themes, Technical Design and Value Probability: 1. Rating Scale of Fictions: the content contains Sources of Motives, Fiction and Imagination and Problem Solving rating scales, which mainly test whether students can complete the process of combining and describing real events and virtual fantasy space in the animation presentation. The rating scale has compiled 20 questions to make a pre-test for students. The pre-test result will be sent to Item Analysis that you will find every question showing discrimination; three subscales respectively with the third, fourth and sixth questions will be obtained after the factor analysis; the whole rating scale has total 13 questions with a  $\alpha$  coefficient .84 of overall internal consistency. 2. Rating Scale of Themes: the content contains Story Structure and Storyboard Design, which mainly test whether students can focus on the activity of mental awareness toward non-existent things to perform a series of illusionary design and combination that will make a psychological form surpassing externality. The rating scale has compiled 17 questions to make a pre-test for students. The pre-test result will be sent to Item Analysis that you will find every

question showing discrimination; two subscales respectively with the fifth and sixth questions will be obtained after the factor analysis; the whole rating scale has total 11 questions with a  $\alpha$  coefficient .84 of overall internal consistency.

Rating Scale of Technical Design: the content contains Lighting and Sound, Characters and Background and Dynamic Development, which mainly test whether students can focus on the themes to perform a series of animation design for your animated illusion. The rating scale has compiled 27 questions to make a pre-test for students. The pre-test result will be sent to Item Analysis that you will find every question showing discrimination; three subscales respectively with the fifth, fourth and third questions will be

obtained after the factor analysis; the whole rating scale has total 12 questions with a  $\alpha$  coefficient .82 of overall internal consistency. 4. Rating Scale of Value Probability: the rating scale has compiled 28 questions to make a pre-test for students, and the result will be sent to Item Analysis, Factor Analysis and Reliability Analysis. The pre-test result will be sent to Item Analysis that you will find every question showing discrimination; three subscales respectively with the seventh, sixth and second questions will be obtained after the factor analysis; the whole rating scale has total 15 questions with a  $\alpha$  coefficient .86 of overall internal consistency.

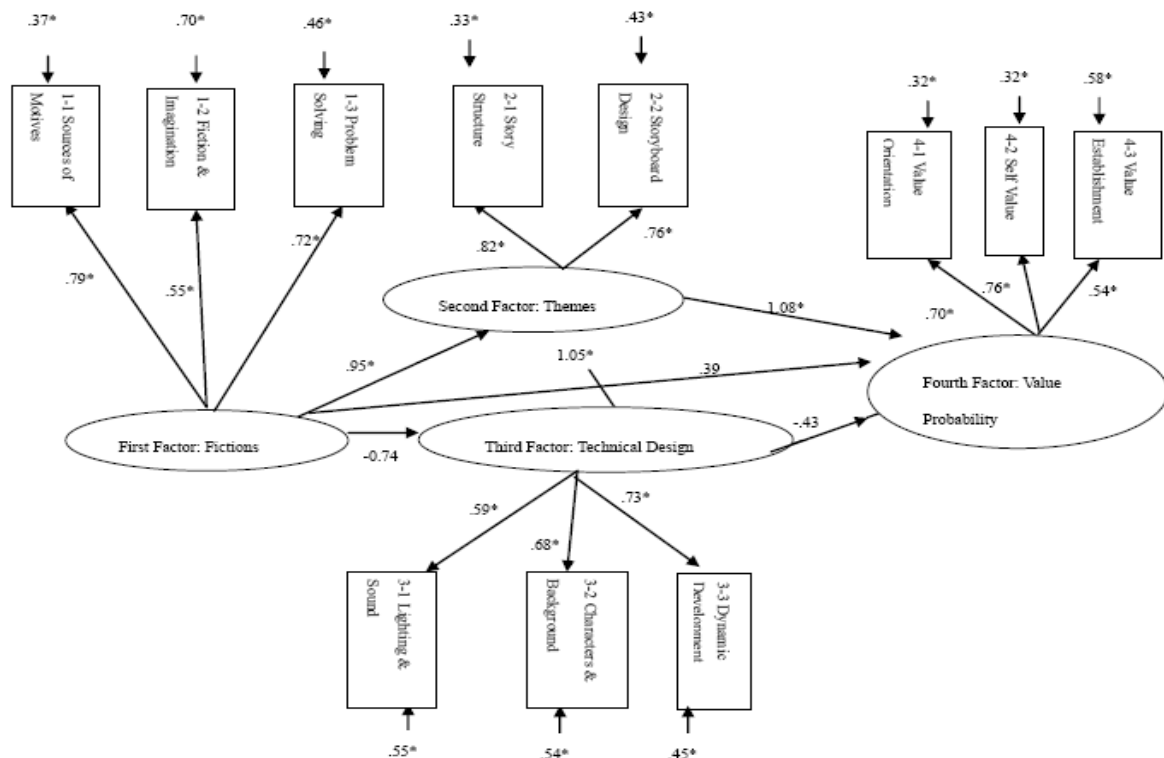


Fig. 1. Learning mode of animation imagination

## V. RESEARCH STEPS AND IMPLEMENT

Here are the research steps and implement processes: planning research project, collecting literature and analyzing data, Scale research and tool development, consulting scholars and professional opinions, selection of the schools to take tests, scale survey, data and statistics analyses, establishment of “Development of Animation Imagination Rating Scales and the Learning Mode”, and writing reports.

## VI. DATA PROCESSING

The data collected after the pre-tests of rating scales will be sent to Item Analysis for checking the relativity between each subscale’s questions and total scores. The Factor Analysis screens out some low Factor Loading and critical ratio questions to obtain a consistency factor to the original structure of scales; additionally, the Reliability Analysis can examine the internal consistency between scales’ questions.

The test result of rating scales for the establishment of “Learning Mode of Animation Imagination” will be sent to hypothesis testing by PRELIS and LISREL computer statistical package, and the relations between variable factors and paths in the model will be analyzed for the goodness-of-fit tests, based on statistical level of significance  $\alpha=.05$ .

## VII. RESULTS AND DISCUSSION

Focus on the research result of the “Learning Mode of Animation Imagination” (shown as Figure 1), this study has gathered the data after survey, and has them been through the Statistical Analysis of Structural Equation Model (SEM), the model congruence will be

investigated from the aspect of Overall Goodness-of-Fit. The guide mode of Overall Goodness-of-Fit and congruence of External Observation Data have been classified to three categories: “Absolute Goodness-of-Fit Index”, “Value-added Goodness-of-Fit Index” and “Simple

Goodness-of-Fit Index". The "Absolute Goodness-of-Fit Index" analysis will obtain a Chi-square value ( $\chi^2=169.605$ ,  $p<.001$ ) to fit the level of significance but not congruence. Besides, the analysis result of "Root Mean Square Error of Approximation" ( $RMSEA = 0.0895>.05$ ) doesn't fit the level of congruence; but the "Goodness-of-Fit Index"

( $GFI=0.912>.90$ ) fits the level of congruence to show amendment availability for Absolute Goodness-of-Fit. The "Value-added Goodness-of-Fit Index" ( $IFI=0.971>.90$ ) fits the level of congruence, the "Comparative Fit Index" ( $CFI = 0.971>.90$ ) fits the level of congruence, and the "Non-Normed Fit Index" ( $NNFI=0.958>.90$ ) fits the level of congruence to show the "Value-added Goodness-of-Fit Index" completely fits the level of congruence. The "Simple Goodness-of-Fit Index" ( $PGFI=0.525>.50$ ) fits the level of congruence. The "Parsimony Normed Fit Index" ( $PNFI=0.665>.50$ ) also fits the level of congruence to show the "Simple Goodness-of-Fit Index" completely fits the level of congruence.

#### VIII. RESEARCH CONCLUSIONS

The "Learning Mode of Animation Imagination" contains four factors of Fictions, Themes, Technical Design and Value Probability (as Figure 1) and the development of Rating Scales, which respectively has other sub-items of factors, the factor Fictions including Sources of Motives, Fiction and Imagination and Problem Solving; Themes including Story Structure and Storyboard Design; Technical Design including Lighting and Sound, Characters and Background and Dynamic Development; Value Probability including Value Orientation, Self Value and Value Establishment. Other than these factors of Fictions, Themes, Technical Design and Value Probability, the learning mode of animation imagination contains two main paths: 1. the factorial processes from Fictions, Themes down to Value

Probability; 2. the factorial processes from Fictions, Themes down to Technical Design.

#### REFERENCE

- [1] C. Y. Wang, *Imagination in Kent's Philosophy*, Master Thesis, Taiwan: Graduate Institute of Foreign Languages and Literature, National Chi Nan University, 2004.
- [2] H. H. Chang, "The Essence of Imagination and Its Function in the Aesthetic Activities of Music," *Journals of National Hsinchu University*, no. 4, pp. 281-301, 2004.
- [3] S. Y. Chen, *The Influence of the Realistic and Imaginative Pictorial Book to the Imagination of Preschool Kids*, Master Thesis, Taiwan: Graduate Institute of Aesthetics and Arts Management, Nanhua University, 2004.
- [4] L. Dart, "Literacy and the lost world of the imagination," *Educational Research*, vol. 43, no. 1, pp. 63-77, 2001.
- [5] G. Heath, Exploring the imagination to establish frameworks of learning. *Study of Philosophy of Education*, vol. 27, pp. 115-123, 2009.
- [6] V. Mountain, "Educational contexts for the development of children's spirituality: Exploring the of imagination," *International Journal of Children's Spirituality*, vol. 12, no. 2, pp. 191-205, 2007.
- [7] N. Uchida, *Developmental Psychology*, Iwanami Shoten, Tokyo, Japan, 1997.
- [8] N. J. T. Thomas, "Imagery and the coherence of imagination: A critique of white," *Journal of Philosophical Research*, vol. 22, 95-127, 1997.
- [9] N. J. T. Thomas, *Imagination*. In C. Eliasmith (Ed.), Dictionary of philosophy of mind, 1999.
- [10] J. Ichikawa, "Dreaming and Imagination," *Mind and Language*, vol. 24, no.1, pp. 103-21, 2009.
- [11] R. Collins and L. Stevenson, *Inspiring imagination-education and learning: the university experience in the regional development cocktail. Academic services division-papers*. University of Wollongong, 2004.
- [12] X. Huang (2009). *Curriculum Design of MT Creative Learning*. [Online]. Available: <http://tw.myblog.yahoo.com/jetskids123/article?mid=1110&prev=1113&next=-1>
- [13] D. M. Lee, *What is Animation*, edited by Yu-Shan Huang and Wei-Zheng Yu, "Exploring Animation Films," Yuan-Liou Publishing Co, Ltd, Taipei, Taiwan, 1997.
- [14] Y. S. Huang, "Further Discussion on Animation-The Origin and Development of Animation," *Influence Magazine*, vol. 74, 49-73, 1997.