ENHANCING ANIMATION STUDIES IN CREATIVE TECHNOLOGY EDUCATION THROUGH AN ENTRPRENEURSHIP APPROACH: THE UMK EXPERIENCE

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The 21st Century can be described as the Digital Era or Digital Age. The emergence of this Digital Era is strongly connected to the momentum of the digital revolution that came about with globalization. In terms of creative wave movements, animation studies is 4th wave: it is multimedia in the field of creative technology. According to Swansea Metropolitan University "The creative industries must move from the margins to the mainstream of economic and policy thinking, as we look to create the jobs of the future". Moreover, at 6% per annum, the creative industries grew at twice the rate of the rest of the economy between 1997 and 2005. The nature of business has changed significantly.

In order to develop a new paradigm of the Creative Economy, the government of Malaysia has started a range of initiatives and provided numerous incentives for animation studies. These efforts are intended to generate a long lasting animation potential in Malaysia, resulting in a strong creative industry that will develop the Creative Economy. One of the strategies to generate the Creative Economy in Malaysia is through the establishment of courses in higher education institutions. Therefore, under the Ministry of Higher Education of Malaysia, the government has approved the establishment of courses in animation studies in higher education institutions throughout the country. One of those higher institutions is Universiti Malaysia Kelantan (UMK). Established in 2006 as the 19th public university in Malaysia, UMK offers a Bachelor's degree in Creative Technology under the Department of Creative Technology and Design, Faculty of Creative Technology and Heritage. UMK also offers postgraduate studies in Master of Arts (Multimedia) or MA and a Ph.D. The uniqueness of animation studies offered at UMK is the combination of practical animation production skills and theoretical knowledge in emerging technologies with heritage elements, using an entrepreneurship approach. With this approach UMK graduates will have a strong foundation of knowledge in both entrepreneurship and animation studies. This will be combined with practical training that will enable them to apply animation theory to meet market needs. As entrepreneurial students, UMK graduates will be able to create new markets in the animation industry.

This paper will discuss the experience of the Department of Creative Technology and Design, Faculty of Creative Technology and Heritage, Universiti Malaysia Kelantan in enhancing animation studies in creative technology education, through an entrepreneurship approach, to contribute to the Creative Industry and Creative Economy development in Malaysia.

Keywords: Creative Technology, Entrepreneurial Student, Creative Technology Education, Creative Industry, Creative Economy

1.0 INTRODUCTION

The 21st century can be described as the Digital Era or Digital Age. The emergence of this digital era appearance is strongly connected with the momentum of the digital revolution which came about with globalization. In terms of creative wave movements, animation studies is 4th wave: it is multimedia in the field of creative technology. According to Swansea Metropolitan University "The creative industries must move from the margins to the mainstream of economic and policy thinking, as we look to create the jobs of the future". Moreover, at 6% per annum, the creative industries grew at twice the rate of the rest of the economy between 1997 and 2005. The nature of business has changed significantly.

In order to develop a new paradigm of the Creative Economy, the government of Malaysia has started a range of initiatives and provided numerous incentives for animation studies. These efforts are intended to generate a long lasting animation potential in Malaysia, resulting in a strong creative industry that will develop the Creative Economy. One of the strategies to generate the Creative Economy in Malaysia is through the establishment of courses in higher education institutions. Therefore, under the Ministry of Higher Education of Malaysia, the government has approved the establishment of courses in animation studies in higher education institutions throughout the country. One of those higher institutions is Universiti Malaysia Kelantan (UMK).

Universiti Malaysia Kelantan (UMK) was established in 2007 as the 19th public university in the country. The establishment of the university is to offer programs that have high entrepreneurial content in their respective curricula. Thus UMK aspires to be the first public institution of higher learning in the region to be recognized as an entrepreneurial university. From its inception, UMK has been propagating its tagline "Entrepreneurship is Our Thrust" as well "Entrepreneurial University" as its brand name. UMK as a public institution of higher learning is entrusted to produce graduates that are not only "enterprising" in their conduct and thinking, but also able to create jobs for themselves (self-employed) and others (job creators). Hence, UMK is continuously developing its entrepreneurship education model to be relevant, unique and different. Since entrepreneurship education alone is found to be insufficient (according to some studies), UMK has developed an extended version of the earlier model to include enterprise education modules. The extended model was developed based on a nationwide survey among the public institutes of higher education that have introduced entrepreneurship education in their curricula (Dahlan et.al. 2009).

Through the Department of Creative Technology and Design, Faculty of Creative Technology and Heritage, UMK offers the degrees Bachelor of Creative Technology with honours (B.C.T) and Bachelor of Heritage Studies with honours (B.H.S), and postgraduate studies for Master of Arts (MA) and Ph.D. in Multimedia. The animation studies at UMK are offered under the Bachelor of Creative Technology with honours (B.C.T) program with electives in Multimedia and Visual Communication. The uniqueness of this program is a combination of practical and theoretical knowledge in both technologies and emerging heritage elements in animation production, with an entrepreneurship approach. Therefore, it is hoped that UMK graduates will have a strong foundation of knowledge in both entrepreneurship and animation studies. This will be combined with practical training that will enable them to apply animation theory to meet market needs. As entrepreneurial students UMK graduates will be able to create new markets in the animation industry. For that purpose, and as an entrepreneurial university, the UMK Education Philosophy emphasizes entrepreneurship attributes through entrepreneurship education and enterprise education in curriculum studies throughout of the university. In the long term, this agenda will support a creative industry and creative economy development in Malaysia.

2.0 PROBLEM STATEMENT

Some forms of entrepreneurship education have already been implemented by some of the Malaysian public Institutes of Higher Learning (IHL) following the financial crisis in Malaysia in 1997 . In most cases entrepreneurship education is delivered through classroom teaching; generally with 2 to 3 hours credit and content heavily based on established entrepreneurship textbooks. In other IHLs, entrepreneurship education is delivered through extra-curricular activities i.e. entrepreneurship clubs, students in free enterprise (SIFE), business weeks, symposiums/seminars, business plans competitions etc.

Despite the variety of entrepreneurship education programs implemented by the public IHLs, the outcome or impact of those programs is still very ineffective. Substantial resources have been committed to conduct entrepreneurship programs; however, the objectives have yet to be achieved. Among the main objectives of the entrepreneurship programs is the inculcation of entrepreneurial values and changing the mindset of students from being highly dependent on job prospects, to becoming courageous enough to take on entrepreneurship as a career option. According to a Tracer Study conducted by the Ministry of Higher Education, less than 4 percent of graduates from IHLs are self-employed either as free lancers, working for their family or setting-up their own business (MOHE, 2009)

From a survey, it was found that many IHLs did not have clear objectives when they embarked on entrepreneurship education. Many were not sure whether their goal was to prepare graduates who are ready to become entrepreneurs upon graduation (graduate entrepreneurs), or to prepare graduates with entrepreneurial talent and competencies (enterprising graduates). Even if the later is the main objective, no discrete measurement has been formulated to ensure that these graduates have the required competencies upon graduation. Despite these flaws it was still hoped that entrepreneurship education would be able to churn out enterprising graduates that could enhance their marketability and employability in the job market. But now, as job offerings becoming scarcer, IHLs are advised to offer entrepreneurship education programs that create graduate entrepreneurs. The problem is whether or not entrepreneurship education modules are sufficient to create graduate entrepreneurs or whether these have to be extended to include learning through experience and enterprises – a real life experiential learning opportunity where instructors' involvement is kept to the minimum.

According to Nik Marzuki Nik Muhammad, VisualXtreme Sdn. Bhd (February 19 – 21 2008) in "Enhancing Global Competitiveness", Pan-Commonwealth Conference On Professional Service Trade at JW Marriot, Kuala Lumpur, the Creative multimedia contents industry had been growing rapidly for the previous five years and was expected to be one of the major contributors to the Malaysian economy by 2010. Therefore, the Malaysian government has provided initiatives to build the necessary capacity in the multimedia industry. From an overview of the local contents market, despite the continuous support by the government, only small numbers of local industry players are producing world class creative content for international market such as Upin and Ipin and Saladin.

Figure 1 : Upin and Ipin   Figure 2 : Saladin
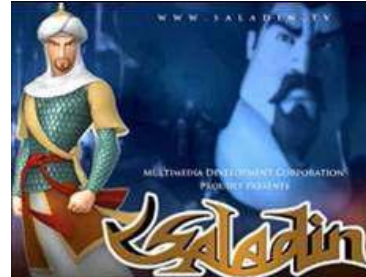
In terms of Human Capital Development in Malaysia, two different approaches in multimedia syllabus development is the IT driven multimedia course or Multimedia Technology, and the arts driven multimedia course. Most of the public universities are using the IT approach, however multimedia graduates from Arts Faculties have better chances of getting hired then those who graduate from IT Faculties. IT driven syllabuses generally put more emphasis on application and tools related skills. The Art driven syllabus on the other hand puts more emphasis on design fundamentals, creative arts and animation principals. More studies are required in this aspect, and the findings from such studies are needed to produce appropriate recommendations and probably a syllabus review.

Based on these considerations, UMK offers animation courses under the Bachelor of Creative Technology with honours (B.C.T) program with electives in Multimedia and Visual Communication. The uniqueness of this program is a combination of practical and theoretical knowledge in both technology and emerging heritage elements in animation production, with an entrepreneurship approach. Therefore, it is hoped that UMK graduates will have a strong foundation of knowledge in both entrepreneurship and animation studies. This will be combined with practical training that will enable them to apply animation theory to meet market needs. As entrepreneurial students UMK graduates will be able to create new markets in the animation industry.

For that purpose, and as an entrepreneurial university, the UMK Education Philosophy emphasizes entrepreneurship attributes through entrepreneurship education and enterprise education in curriculum studies throughout the university.

This philosophy and the slogan "Entrepreneurship is Our Thrust" is applied to all UMK activities and programs. The long term goal of UMK is to produce human capital that can be self-employed, or job creators, and in doing so to support a creative industry and creative economy development in Malaysia.

This paper shall discuss the experience of the Department of Creative Technology and Design, Faculty of Creative Technology and Heritage, Universiti Malaysia Kelantan in enhancing animation studies in creative technology education through an entrepreneurship approach to contribute to the Creative Industry and Creative Economy development in Malaysia. Based on these experiences, a new entrepreneurship approach model which includes enterprise education and studio practice modules as a major component will be discussed.

3.0 UMK'S PHILOSOPHY, CONCEPT, OBJECTIVES AND ATTRIBUTES OF GRADUATES

3.1 Philosophy

As an entrepreneurial university, UMK believes that everyone stands the chance of being a successful entrepreneur providing that they are nurtured, guided and trained in a systematic manner. Thus, UMK holds to the philosophy that entrepreneurs are not born, but can be created through proper education and training. This philosophy is disseminated through UMK's vision and mission as well in various educational policies in the anticipation of transforming the culture towards entrepreneurialism. UMK has also developed an entrepreneurship ecosystem - "Enterprise UMK™" to serve as a blueprint to translate the philosophy into action and reality (Figure 4). There are three types of engagement namely student engagement, staff engagement and university engagement.

Figure 4: UMK's Entrepreneurship Ecosystem™
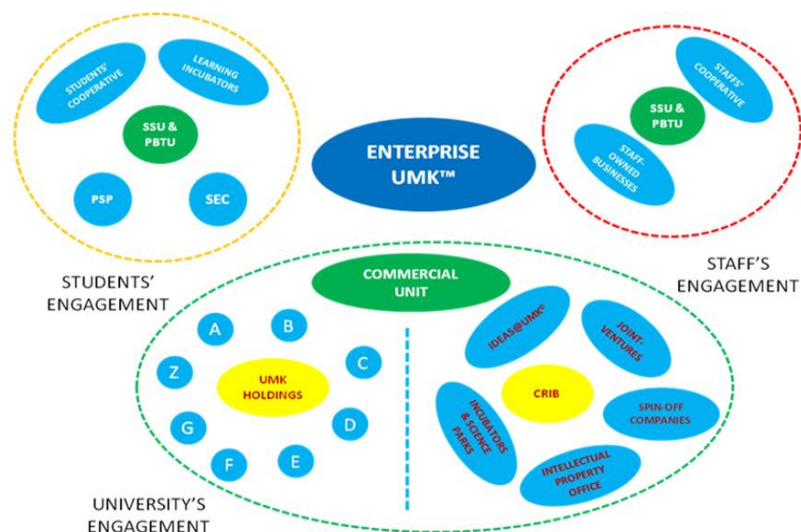
Source: *Mohamed Dahlan Ibrahim, (2009). Entrepreneurship and Enterprise Education Model: Experience from Universiti Malaysia Kelantan*

3.2 Educational Concept

In delivering the content of the curriculum, UMK's educational pedagogy is based on the concept of outcome-based education. This means that for every program of study, the learning outcomes must be clearly spelt out, and the educational matrix for each of the courses mapped out, to ensure students are able to achieve their learning outcomes. Student-Centered Learning (SCL) is the main focus in the delivery system where a significant portion of total student learning hours is dedicated to this type of learning.

UMK's pedagogy is also based on the amalgamation of established knowledge with tacit knowledge through an entrepreneurship and enterprise education model. Established knowledge refers to the knowledge that can be readily learned in a classroom environment whereby the learning environment is artificial. On the other hand, tacit knowledge refers to knowledge acquired via life experiences such as from family, workplace, society as well as from our own personal experiences. This type of knowledge seems to be long lasting and contributes positively to strengthening entrepreneurial intention (Dahlan, Hakimin and

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Noorul, 2008). In other words, tacit knowledge can only be acquired through learning by doing (action learning/learning through experience). Thus, a theoretical-practical approach i.e. combining theory with practice through POBL, case studies, simulation, experiential learning, apprenticeships, etc., is the main mode of teaching and learning.

3.3   Educational Objectives

UMK is committed to fulfill the following educational objectives:

- To produce graduates that are enterprising i.e. competent, innovative and creative, calculated risk takers and opportunity creators.
- To produce graduate entrepreneurs that exhibit similar entrepreneurial characteristics to those of successful entrepreneurs
- To propagate becoming an entrepreneur as a preferred career choice in terms of wealth creation and nation-building.
- To become an entrepreneur by choice, <u>NOT</u> by chance (accidental entrepreneurs).

Currently, in addition to the normal classroom teaching, UMK also provides numerous learning support programs to enhance the experiential learning of every student.

3.4   Graduates Attributes

As a young university, UMK has to ensure that its graduates are readily acceptable by the industry. Thus, the University has delineated a set of attributes that UMK graduates possess. (Figure 5). Enterprising Graduates is the core attribute supported by other attributes: Creative and Innovative, Brave enough to undertake risk, quipped with Entrepreneurial skills and competencies, Knowledgeable in their related field of studies, Leadership skills, Team Player qualities, Communication Skills, a High Achiever mentality, Ethical.

Figure 5: UMK's Graduate Attributes
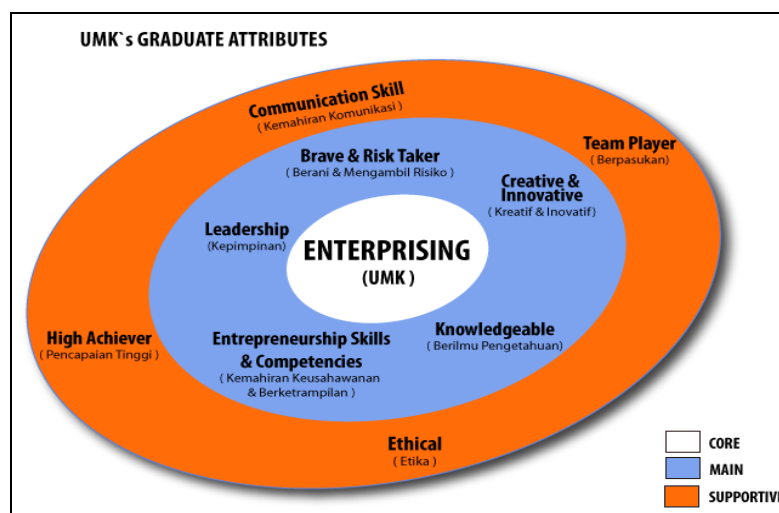
By identifying the specific attributes for the graduates, the education process must ensure that they are inculcated with these attributes. UMK's entrepreneurship and enterprise education model is intended to make certain that the graduates are instilled with the required attributes. Specific measurements have been formulated to examine whether graduates possess the attributes upon graduation.

4.0 ENHANCING ANIMATION STUDIES IN CREATIVE TECHNOLOGY EDUCATION THROUGH AN ENTREPRENEURSHIP APPROACH
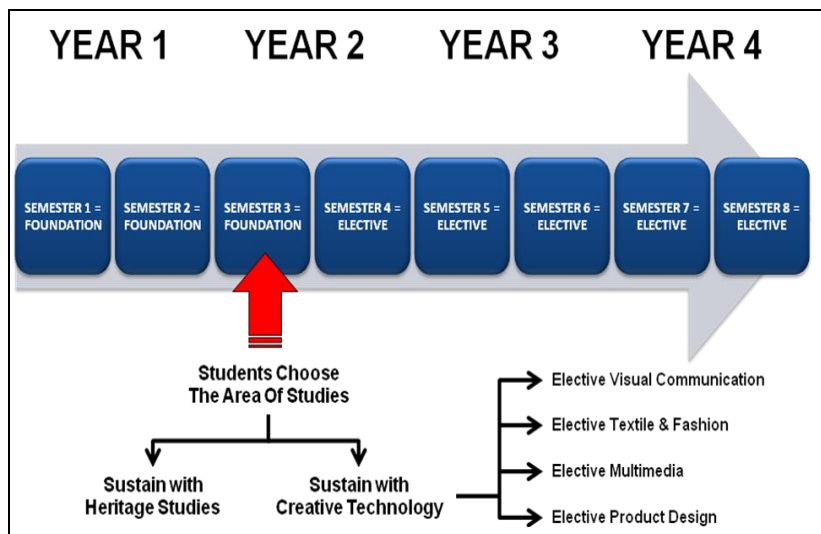
4.1 Creative Technology Education

In the Faculty of Creative Technology and Heritage there are two programs offered: the Heritage Studies Program (SCW) and Creative Technology Program (SCK). The Heritage Studies Program is a generic program, and Creative Technology Program (SCK) is an elective program. Under the Creative Technology Program, there are four electives offered: Multimedia, Visual Communication, Product Design, and Textile and Fashion Design. Animation Studies for the Creative Technology Program are taught as part of the Multimedia and Visual Communication electives. The faculty's curriculum structure requires all students to fulfill 122 credits within four years of studies (figure 6).

Figure 6: Faculty of Creative Technology and Heritage **Studies Structure**

COURSE	CREDIT	WEIGHTAGE
University Compulsory Courses / Liberal Studies	24	20 %
Faculty Compulsory Courses	48	39 %
Program Core Courses	32	26 %
Program Elective Courses	6	5 %
Entrepreneurship Elective Courses (*Faculty of Entrepreneurship and Business*)	12	10 %
TOTAL	**122**	**100 %**

In the first three semesters there is a broad based curriculum, whereby all students in the Faculty of Creative Technology and Heritage are required to complete foundation studies that instruct students in creative technology and heritage knowledge. The courses related to creative technology are CFT1016 Drawing, CFT1056 Basic Studio, CFT1073 Visual Presentation Techniques, CFT1093 Computer and Art, CFT1063 Basic Multimedia and Web Technology, and CFT1082 Basic Product Design. The courses related to heritage are CFT1022 Malay Culture and Civilization, CFT1032 Traditional Art Design, and CFT1043 Anthropology and Sociology. This combination is designed to produce a strong foundation for creating products. Students will be able to merge knowledge of arts, technologies and heritage together to produce their product. Later, in semester three, students decide between the fields of specialism either Creative Technology or Heritage Studies. Starting from semester four until semester eight, students focus on the program and elective that they are interested in specializing in (figure 7).

Figure 7: Faculty of Creative Technology and Heritage**'s Curriculum Structure**

The Creative Technology Program emphasizes hands-on practice, of which seventy two percent is practical, computer and skills based and the remaining twenty eight percent is theory based (figure 8). Therefore, if the students choose Multimedia or Visual Communication as an elective, they have to take courses related to animation studies emphasizing hands-on practice. These courses are CVT2162 2D Animation, CMT2103 2D and 3D Animation, CVT3143 Computer Graphic 3D Modeling and CMT3122 Narrative Structure Design. Besides that, students also have to study other courses related to this area such as CFT1093 Computer and Art, CFT1063 Basic Multimedia and Web Technology, CVT2122 Digital Design, CMT4153 Video Exploration, CVT4192 and CVT4193 Video Production, and CMT3162 Creative Digital Art, which also emphasizes hands-on and studio practices.

Figure 8: Faculty of Creative Technology and Heritage **Curriculum Weightage**
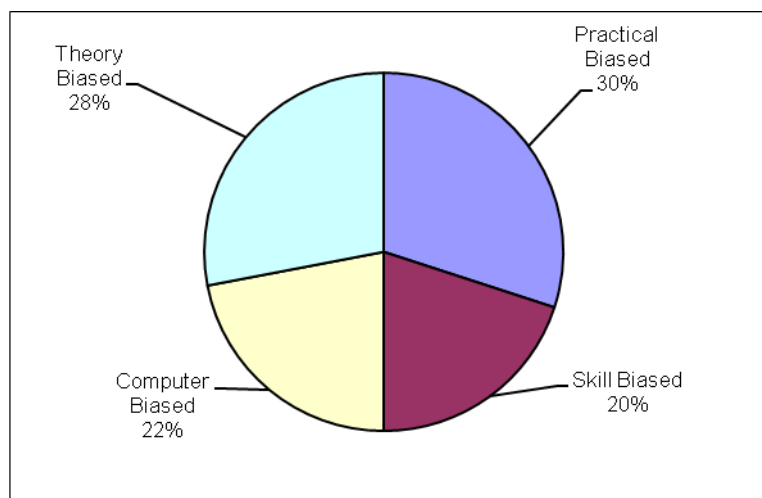
4.2   Entrepreneurship Approach

In delivering the content of the curriculum, the faculty's educational approach is based on the Entrepreneurship Approach (figure 9). This means that for every course of every program, the entrepreneurship approach is used to ensure students are able to achieve their learning outcomes. In order to ensure this approach is applied, students of the Faculty of Creative Technology and Heritage are required to learn about entrepreneurship. These courses are offered by Faculty of Entrepreneurship and Business: AFT1013 Basic Entrepreneurship, AFT1023 Basic Management, AFT1033 Economy Principles, AFT1053 Marketing Principles, or APT2013 Entrepreneur Characteristics. Through these courses, students are able to produce a business plan and also learn how to commercialize their product. From the perspective of soft skills development, students will learn about entrepreneurship attributes.

As an Entrepreneurial University, students have to apply their knowledge and skills in the real world. Therefore, UMK includes a practical apprenticeship course called CFT4112 Students in Enterprise Program (SIEP) which is implemented throughout all the faculties in various modules (figure 9). In the Faculty of Creative Technology and Heritage, students have to complete four modules in the duration of 40 days with different learning outcomes. For each module, students choose one industry to study through observation, asking questions, and learning through experiential methodology. After completion of this course, students should be able to understand the entrepreneurship structure (Module 1), understand about systems and concepts of company operation (Module 2), be able to analyze the entrepreneurship culture using a SWOT analysis (Module 3), and be able to evaluate entrepreneurship ethics and produce new ideas or suggestions for entrepreneurship project improvement (Module 4). These programs will help students to produce their own products having learnt from industries . Also, in order to enhance student's soft skills, all entrepreneurship attributes and theories that they learn in classroom are implemented through the SIEP program. This program emphasizes both established knowledge and tacit knowledge through an Entrepreneurship and Enterprise Education model. Established knowledge refers to the knowledge that can be readily learned in classroom environment whereby the learning environment is artificial. Tacit knowledge refers to knowledge acquired via life experiences such as from family, workplace, society as well as from our own personal experiences. This type of knowledge seems to be long lasting and contributes positively to strengthening entrepreneurial intention (Dahlan, Hakimin and Noorul, 2008). In other words, tacit knowledge can only be acquired through learning by doing (action learning/learning through experience). Thus, a theoretical-practical approach combining theory with practice through POBL, case studies, simulation, experiential learning, apprenticeships, etc., is the main mode of teaching and learning.

An internship course in semester 7 (figure 9) is another component to this approach. After completion of this internship, the student will have gained a useful understanding of a real workplace including the operational, development and management process. The student will also have personally experienced involvement in project including challenges of time, sourcing materials, financial matters, infrastructure factors and human resource issues. They will also have learned how to face and solve problems, and will have developed skills in contributing creative ideas. All these outcomes are enhanced as students apply all entrepreneurship attributes, theories, skills and knowledge that they have learned in the classroom.

In addition to producing human capital in the entrepreneurship field, UMK encourages entrepreneurial programs to support students' achievements. These programs include the Chairman Lecture Series (CLS) at university level and for students of the Faculty of Creative Technology and Heritage a program called Myth and Reality (figure 9) and entrepreneurial visits. Through these programs students learn about successful entrepreneurs' experience in

terms of how they established themselves and how they developed their companies.. The things students learn from these programs can be implemented in their internship placement.

The process to develop students' abilities as entrepreneurs and the inculcation of entrepreneurial attitudes needs to be evaluated. Therefore, the Faculty of Creative Technology and Heritage has introduced an assessment program called XAD (Assessment and Exhibition Day) – figure 9. Students participate in this each semester from semester one until semester seven. In semester eight, this program is replaced by a final assessment called "Degree Show." At the end of each semester, students are required to produce a product from every course they took. With the knowledge from entrepreneurship courses, SIEP and internship program, students are able to produce a business plan and commercialize their product. To ensure assessment accountability and quality of products, all student projects are evaluated by both an internal lecturer and an external assessor with experience locally and internationally. The assessor explains the strengths, weaknesses and improvements that students could make in their projects. Through this process, the Faculty believes that students' achievements will continue to improve in the future. Therefore, the Faculty's evaluation is based 100 percent on project assessment with the weightage of marks of 70 percent on continuous assessment and 30 percent on final assessment. In summary, the Faculty emphasizes an evaluation process with hands-on methodology and an entrepreneurship approach.

Another way in which entrepreneurship attributes are developed among students and staff is through competitions; all students and staff are encouraged to participate in competitions for design professionals at either the national level or international level. So far, at the national level, the faculty's students and staff have participated in the Seri Endon Cup, Seri Iman Cup, Multiprog Competition and Footwear Design Competition. At the international level, the faculty's students and staff have participated in the International and Exhibition (ITEX) and International Wau Festival. Staff throughout the faculty are actively involved in these competitions because they are required to act as role models to the students in order to implement "walk the talk" principle. Staff members active involvement in design has also included the establishment of the Design Center Group (DCG), office gallery and staff participation in producing the Chancellor's Mace, faculty logo, University corporate design including t-shirt, and even University building design. .

Figure 9: Entrepreneurship Approach
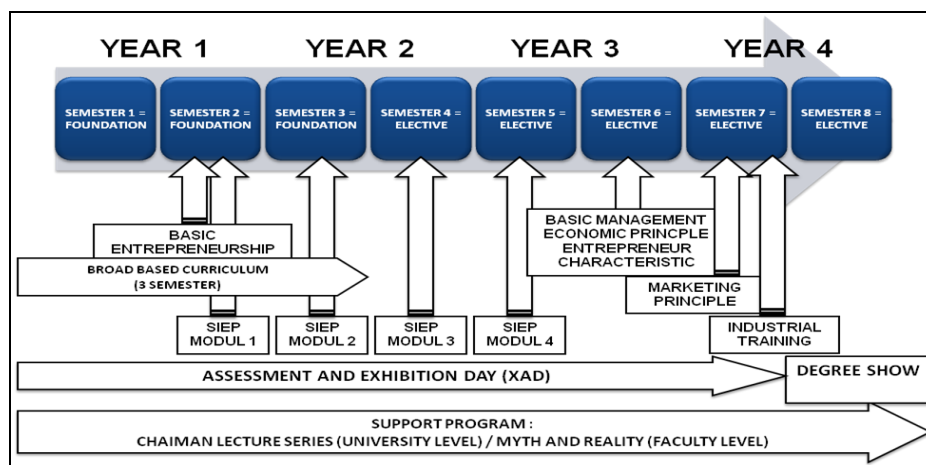
Source: *Ahamad Tarmizi Azizan, (2010). Entrepreneurship Education in Creative Technology: UMK Experience. NCEE Proceeding. KTC: Kota Bharu Kelantan, Malaysia. Sept., 25-26, 2010.*

4.3   Enhancing Animation Studies Through an Entrepreneurship Approach

The uniqueness of animation studies offered at UMK is the combination of practical animation production skills and theoretical knowledge in emerging technologies and heritage elements, using an entrepreneurship approach. This is combined with practical training that enables students to apply animation theory to meet industrial standards and market needs. As entrepreneurial students UMK graduates should also be able to create new markets in the animation industry. That's why, UMK emphasizes student-centered learning (SCL) as the main focus in the delivery system where a significant portion of total students learning hours is dedicated to this type of learning. Therefore, in order to make these aims become reality, the Department of Design and Creative Technology, Faculty of Creative Technology and Heritage, University Malaysia Kelantan has applied a Final Project Development Model (The FDP Model - improvement from 4e Model[TM]. Entrepreneurship and Enterprise Education Model: Experience from University Malaysia Kelantan, Mohamed Dahlan Ibrahim, (2009))) as shown in figure 10. The model uses the input-transformation-output model to exemplify the important components i.e. the outcome/outputs, the delivery process and the required inputs and has been developed from the Entrepreneurship and Enterprise Education Model (4e Model[TM]) by Mohamed Dahlan Ibrahim (2009).

Figure 10: Final Project Development Model – The FDP Model
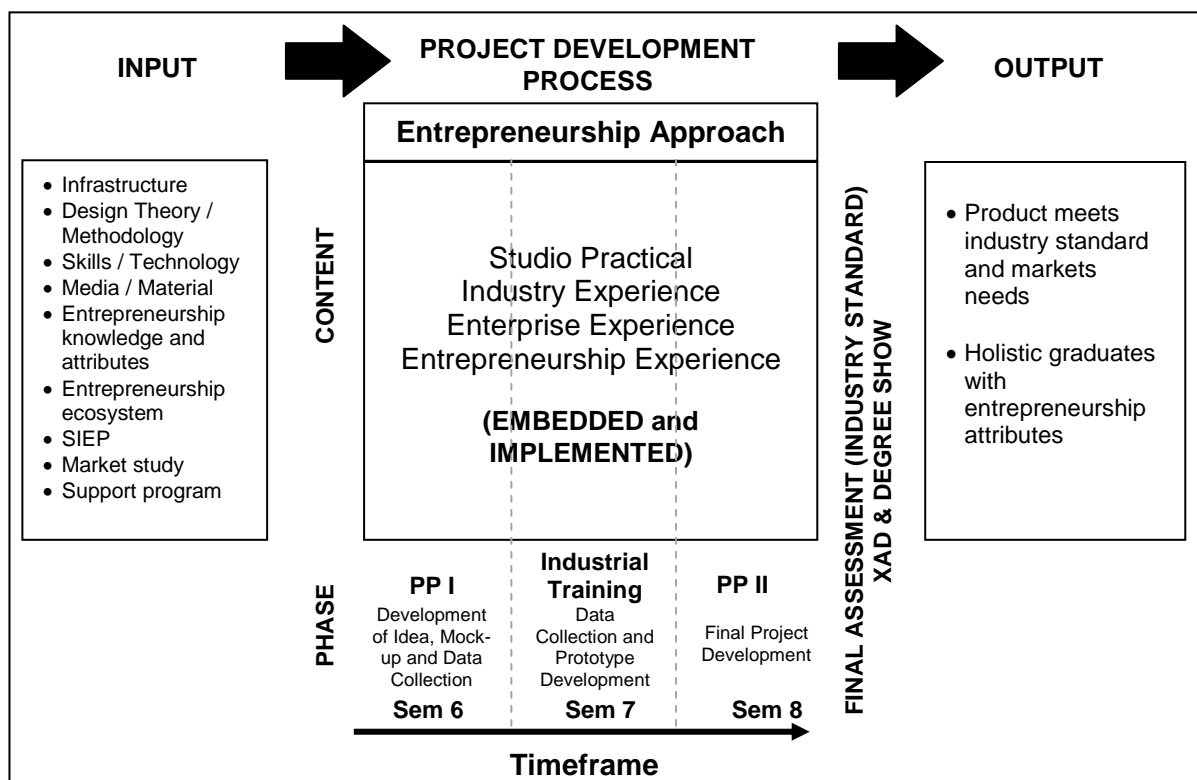
Source: Makyong Dua Indera: Creative Exploration Through Animation. National Conference onStudio Practice, Tropicale Colmar, Bukit Tinggi, Pahang, Malaysia. Jan, 25-26, 2011.

Based on the FDP Model (figure 11), after the students have studied CWT3103 Research Methodology in semester five, they will able to create a research proposal in creative technology fields (including animation research) or heritage studies fields. Later, students will improve the animation studies proposal and submit it to their supervisor in semester 6 through CFT3124 Research Project I. If the proposal is approved, students will

start writing a report for chapter 1 (Introduction), chapter 2 (Literature Review & Market Study) and chapter 3 (Research Methodology) accordingly to the research title and scope. They are also need to develop measurement tools and instruments to be used in data collection. Besides that, students are required to develop a mock-up, or prototype project (depending on student ability), before they are ready to collect the data. In the animation studies programme at UMK, these processes are identified with the pre-production phase which includes the elements of requirements, research, storyboarding and cost considerations.

In order to implement the model, students are required to register for the Internship Course (CFT4108 Internship Training) in semester 7 (shown in figure 10 and figure 11). Students bring all the measurement tools and instruments together with a mock-up or prototype project to the industries. By using the measurement tools and instruments of data collection in cooperation with industry, students will collect data and improve their project prototype. The combined input from industry, lecturers and internship supervisor will help students to improve their project and research findings. In animation studies at UMK, these process are identified with the pre-production phase whereby the requirements, research, and storyboarding including cost considerations are made. In this phase, students have to obtain the exact requirements from industry, do some research, produce a storyboard and estimate costs. Then they need to confirm that their proposal fulfils the requirements of the industry.

In semester 8, students start writing a report for chapter 4 (Result Analysis and Discussion) and chapter 5 (Conclusion and Suggestions) through the module CFT4124 Research Project II (figure 10). At the same time, they also have to improve their product as a final project. Therefore, in this semester, students have to analyze and discuss all the data they collected while in internship training. In terms of the final project, the students are required to finalize the product improvements in order to exhibit the product in the Degree Show program. In this semester, besides advice from their supervisor, the student still needs the advice and involvement from industry in order to help improve the student's project. This ongoing collaboration between university and industry will help students to produce a product which meets industrial standards and markets needs. The result of this collaboration is a combination of practical and theoretical knowledge in technologies and emerging heritage elements in animation production through an entrepreneurship approach. This is how the Faculty enhances animation studies in creative technology education through an entrepreneurship approach. Based on early findings, the implementation of this approach through the FDP Model has successfully helped student's develop their final project (Appendix A). In conclusion, the process and explanations above can be translated and summarized into a graphical representation shown in figure 11.

Figure 11: Final Project Development Structure
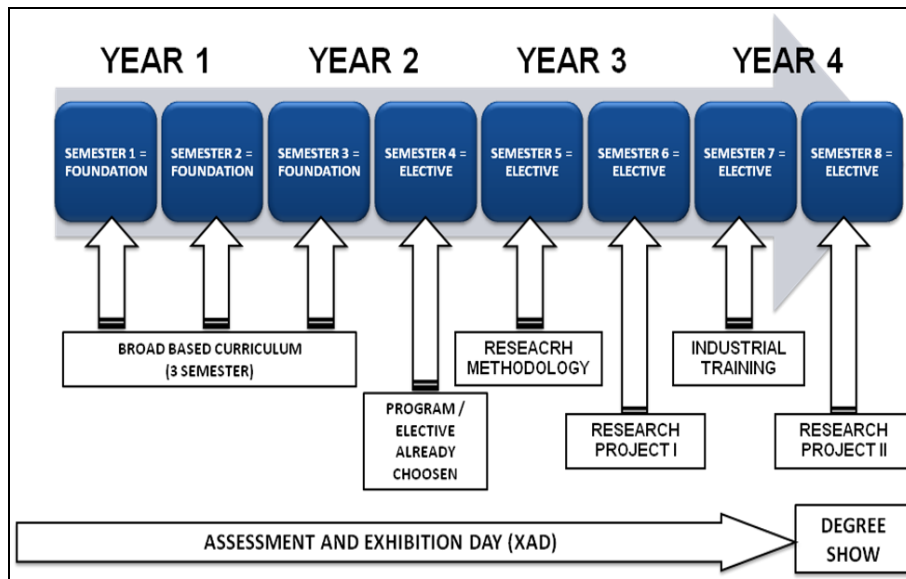
Source: *Ahamad Tarmizi Azizan, (2010). Entrepreneurship Education in Creative Technology: UMK Experience. NCEE Proceeding. KTC: Kelantan, Malaysia. Sept., 25-26, 2010.*

4.4 Challenges and Key Success Factors in Implementing the Entrepreneurship Approach

Based on work by Mohamed Dahlan Ibrahim (2009), there are several factors that contribute to the success of implementing the entrepreneurship approach in UMK:

i.   A comprehensive entrepreneurship ecosystem (figure 4) must be established within the institution. The ecosystem must be based on the principle of inclusiveness, sustainability and equitability.

ii. Support from top management and stakeholders are equally vital. Without their support, implementation of the entrepreneurship approach would be handicapped thus it is important to convince the relevant authorities that the benefits of the entrepreneurship approach are aligned to the general philosophy of a particular institution.

iii. Clear guidelines and policies to facilitate rather than inhibit entrepreneurial activities must be published and implemented.

iv. Commitment from all levels – faculties and departments is also crucial so that entrepreneurial thinking becomes the norm for the institution.

v.   Current policies and regulations have to be relooked and reformed wherever necessary. Any regulations that could curtail the development of the entrepreneurship culture should be revised.

The above challenges, once overcome would lead to a greater chance for successful implementation of the entrepreneurship approach.

5.0   CONCLUSION

This paper highlighted curriculum structure and a model that is currently being experimented within a public university. Although, the success of the model is yet to be realized, UMK is confident that the model will contribute to a significant level of success in producing human capital as envisaged by the university. Once the model has been tested, it will be further improved until it is able to produce the intended results without and difficulty. The curriculum structure and a model was developed from an extensive study and could also be applied to any discipline of study even in the technical fields or sciences. The strength of the model relies on the amalgamation of knowledge with effective pedagogy to achieve the outcome. In addition, the implementation of the model can be measured since the desired outcome for each stage has already been predetermined. Therefore any corrective actions can be undertaken as and when shortcomings are discovered.

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APPENDIX

3D ANIMATION : INDERA DEWA
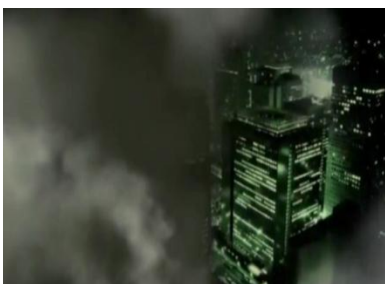## (Montage Screen Shot)

Screen shot 1

Screen shot 2

Screen shot 3

Screen shot 4

Screen shot 5

Screen shot 6

Screen shot 7

Screen shot 8

Screen shot 9

Screen shot 10