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Guidelines of Educational Video Production for Malaysian Digital Natives

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Abstract:

The development of education intelligence involving the media imposes a major challenge to the students and teachers in the 21st century learning paradigm. This is mainly due to the lack of established models, guidelines and techniques in the development process of educational media materials. Furthermore, the Malaysian Education Reform Plan (2013-2025) also emphasizes on the task of making the learning process in schools more contextual, authentic and meaningful, so that the students will be able to face the challenges outside school. Daniel Anderson and Elizabeth Lorch (2008), proposed that video programs leads to a sensory bombardment that produces a series of orienting responses that interferes with cognition and reflection which will lead to contextual, authentic and meaningful learning. Therefore, the main aim of this research is to propose a conceptual model of educational video production for the 21st century learning (digital natives). Both primary data and secondary data was applied in this research as it examines the problem stated earlier to be certain of and to describe the characteristics of the issue. The process of research was quantitative.

Online and on-site questionnaire were designed and developed to conduct the survey on students. The questionnaire was built in accordance to 4 main constructs:

- Content
- Instructional Design
- Technical Design
- Social Considerations

The sampling for this research comprised of 80,000 students, 8,000 teachers and 50 educational video programme producers. There is no problem in handling such a big size because the survey was conducted on line via the EduwebTV website (www.eduwebtv.com) and on site in selected schools. The online survey auto generated the outcome to facilitate the summarizing process. The data collection took a time frame of 2 months. Aspect of accuracy, cost and the homogeneity of the sample population was given priority to amid biasness and inaccuracy.

The 12 prototypes that were developed based on the four constructs (content, instructional design, technical design and social consideration) recorded a high acceptance rate in the user acceptance study using the instruments developed for this research. The outcomes of this study resulted in the design and development of the proposed conceptual model of education video production. This conceptual model will contribute to the analysis and development of educational video programs for the digital natives. The model can be referred as guidelines by educational video programs developers. Furthermore, the prototypes that were developed for the user acceptance study can assist the Malaysian Ministry of Education in using quality information for the development of educational video programs.

Keywords: Educational video programs, conceptual model, digital natives, education intelligence.

1. Introduction

It has been widely discussed that the education system is not successful in preparing students with the skills and knowledge that are most important for them to survive the challenges they will face when they leave school (Borko & Putnam, 2012). The task we are facing is to make the learning process in school more contextual, authentic and meaningful. In addressing this problem, we have to connect real life situations and contexts to the syllabus in school. This will motivate the students to be more self-regulated. Brown and Campione (1994) demonstrated that in the absence of media, in school, a lot of 'inert' (lacking the ability or strength to move)

knowledge is acquired, which implies that students have not extended their conceptual knowledge base. The information they have newly acquired has been encapsulated, and it cannot be retrieved unless an explicit cue to its activation is given. In the 21st century learning environment, that cue can be created using the media, where a need to self-efficacy, an urge to take part actively, be committed and efficient with proper time management and metacognitive awareness will be emphasized (Borkowski & Thorp, 1994; Lohnes Watulak & Kinzer, 2013).

Even though there are many resources on the web that offers various education video programmes, not all of them can be used by the students in Malaysia to fulfil the need of the syllabus and learning outcomes. The learning resources that are available on the web do not support or be consistent with provincial and local curriculum outcomes. Consequently, they are not appropriate for the subject area and for the age, emotional development, ability level, learning styles and social developments of the students for whom the materials are selected (Malaysian Education Reform Plan, 2013 – 2025).

It has been stated clearly in the Malaysian Education Reform Plan, 2013 – 2025, that these elements are not given prior attention in the production of educational video programs and should be taken into serious consideration. Besides that, the assessment and evaluation that these materials offer are not supportive of continuous learning by the individual, provide for both formative and summative assessment/evaluation as appropriate and be relevant to the needs of the student.

Due to all these reasons, there is a dire need to build a conceptual model of education video programme production that will provide the Malaysian Ministry of Education a guide line for producing the much needed education video programmes that will support the success of the Malaysia Education Reform Plan (2013 – 2025). In conjunction with this statement, the main purpose of this study is to propose a conceptual model of educational video production for Malaysian digital natives, with 4 specific objectives:

- i. To identify the content specifications for the production of educational video programmes in the Malaysian context.
- ii. To identify the elements of instructional designing that is suitable for the production of educational video programmes in the Malaysian context.
- iii. To identify the technical design elements that are suitable and should be applied in the production of educational video programmes to suit the learning process according to the Malaysian context.
- iv. To identify the social considerations that should be taken into account in the production of education video programmes in the Malaysian context.

This paper is presented with the following order; introduction, methodology, followed by the results, discussion, limitations and suggestions for further research and ends with the conclusion.

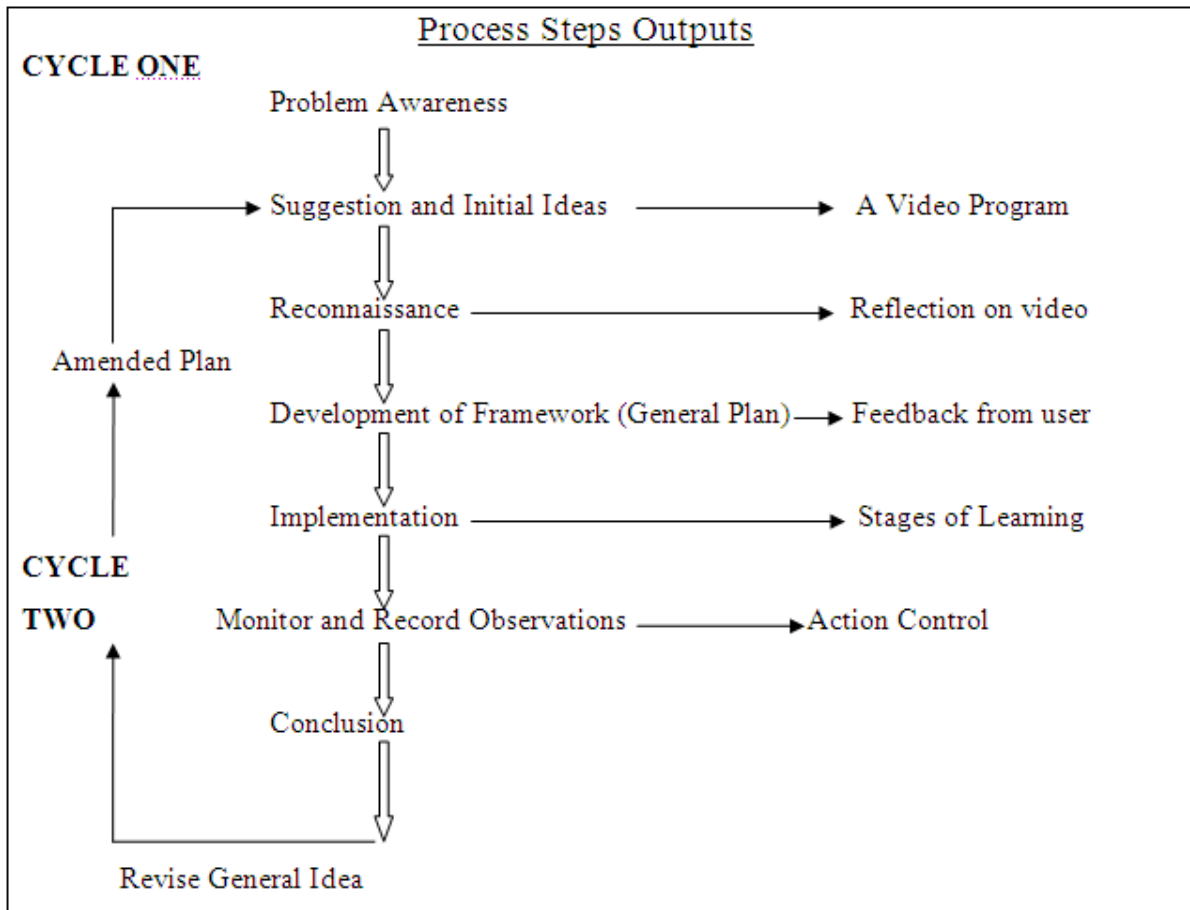
2. Method

Online and on-site questionnaire (self-completion questionnaire) was designed and developed to conduct the survey on students. The questionnaire was built in accordance to 4 main constructs:

- Content – 14 items (question 1-14)
- Instructional Design – 13 items (question 15-27)
- Technical Design – 13 items (question 28-40)
- Social Considerations – 13 items (question 41-53)

The development of the questionnaire was based on the combination of the proposed model, and adapted from various existing video evaluation instrument. Additionally, similar user-acceptance studies have used researcher-designed self-completion questionnaires for data collection (King & He, 2006; Legris, Ingham, & Collette, 2003; Schepers & Wetzels, 2007; Turner, M., Kitchenham, B., Brereton, P., Charters, S., & Budgen, D., 2010). The respondents were required to indicate their agreement or disagreement with the questionnaire items on a five-point Likert-type scale. The traditional five-point scale is used so the respondents will have the choice to select responses in the centre of the scale (Anderson, 1985; Casley & Kumar, 1988; Downie, 1967). The responses for the five-point scale were: strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). The constructs identified to be measured among its users are in the form of a quantitative survey containing 53 items that measured the criteria of educational video programs.

In achieving the 4 stated objectives, this study employs the general methodology of Design Science Research as in Figure 1 below. In Cycle One of this Action Research, the researcher made prototype educational videos to encourage students to use it as an educational video program. This is the initial idea to create learning motivation. The use of these videos by the students was examined by the researcher (reconnaissance). Teachers were requested to write reflective journals on the use of these videos by the target students.



*Figure 1: The General Methodology of Design Science Research
(Vaishnavi & Kuechler, 2008)*

The target students were given the prepared questionnaire to respond and at the same time, interview with the selected teachers were also held. The researcher also engaged the students in the video making process by allowing them to make suggestions and recommendations in the production of educational video programs. The suggestions and recommendations of the students were focused mainly on:

- making learning (in the school and outside school) more authentic, useful and contextualized to the 21st century and the digital natives.
- connecting learning to real life contexts and situations.
- providing students with the skill and motivation to be self-regulated learners.

In Cycle Two, the researcher used the ideas, suggestions and recommendations of the students (where appropriate), and the guidance of teachers in implementation of learning strategies and theories, to revise the general idea in the first set of videos and produce a set of second prototype educational videos. In this phase, the issues were identified by:

- analysing documents related to education video programs.
- comparing analysis of previous digital materials.

In the second prototype videos, the researcher has identified and rectified the challenges of using educational video programs in classrooms and outside the classroom, identified the benefits of using educational video programs in and outside the classroom and also identified the good practice of technical aspects in the production of educational video programs. These refined educational video programs (second prototype) were used in the User Acceptance Study to collect data from teachers, students and producers (quantitative study). Figure 2 below elaborates the phases involved in this research, the task carried out by the researcher and the outputs of the method.

Teachers, students and producers of educational video programs were the population in this research because they are the characteristic that was targeted and questioned in this research. This research used the 'randomization' process to select population members for the given samples. Emphasize was given to make sure that every member of the population had an equal chance of being selected to participate in this research.

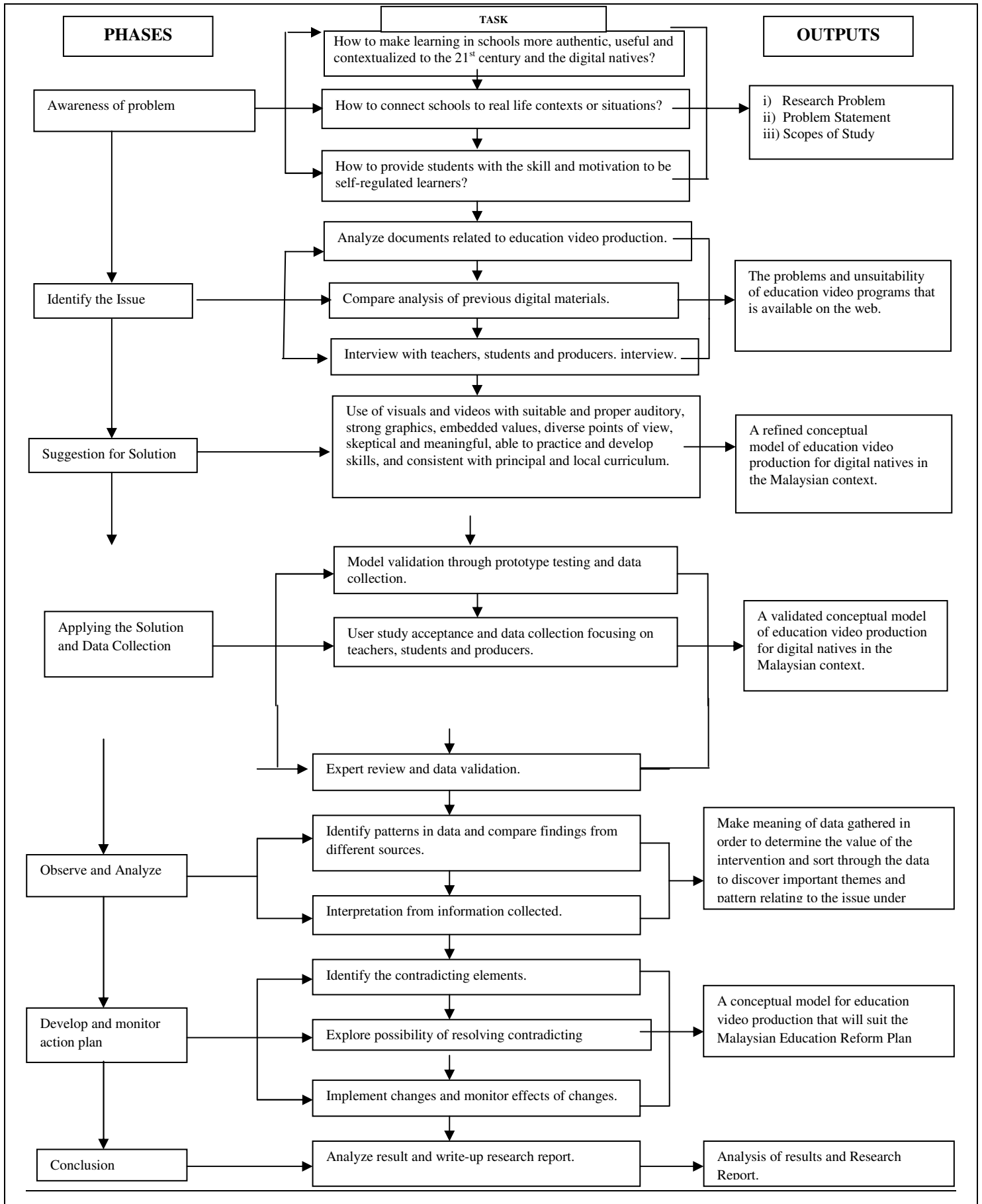


Figure 2: Research Method (Elaborated Version of the General Methodology of Design Science Research (Vaishnavi & Kuechler, 2008)

Dr. John Curry, Professor of Educational Research, North Texas University, (Donald Ary, Lucy Cheser Jacobs, and Asghar Razavieh, Introduction to Research in Education, 2013) provided his research students with the “rule of thumb” on sample size. (See table 1 below).

Size of Population	Sampling Percent
0 – 100	100 %
101 – 1,000	10 %
1,001 – 5,000	5 %
5,001 – 10,000	3 %
10,000 +	1 %

Table 1: Rule of Thumb (Sampling Percentage)

According to the statistic provided by Ministry of Education, Malaysia (Malaysian Education Reform Plan, 2013 – 2025), there are about 800,000 teachers in Malaysia in the year 2015-2016 and the number of students are about 8 million. Programme producers total up to about 50 comprising 20 from Ministry of Education, Malaysia, 15 from Astro Tutor Channel and 15 from other free-lance production houses (World Summit on Media for Children Foundation).

Following the “rule of thumb”, 1% of 800,000 teachers were 8,000 teachers who were selected as sample of studies and this sample was equally selected from the 15 states in Malaysia, which was about 530 teachers from each state ($8,000 / 15 = 530$). An equal number of primary and secondary school teachers mixed proportionally of both genders were selected.

As the number of students in Malaysia is about 8 million (Malaysian Education Reform Plan, 2013 – 2025), the sample of 1% was about 80,000 students and that means about 5300 students (equal number of primary and secondary and male and female) from each state in Malaysia. The size of population for program producers is less than 100, so as sampling percent of 100%, all 50 producers was included as sample in this research.

The raw data were analysed using the descriptive statistics and inferential statistics. Percentages were used to analyse the data collected. The computed percentage of each item was compared according to the four main constructs; content, instructional design, technical design and social considerations.

Descriptive statistics were used to describe the basic features of the data in this study. They provided simple summaries about the sample and measures using frequency distribution in the form of percentage. Together with simple graphics analysis, they formed the basis of virtually every quantitative analysis of the data collected.

3. Results

The results of this research generated the conceptual model of education video program production. The model is built based on the four main constructs (content, instructional design, technical design and social consideration) consisting critical criteria for the development of educational video programs. The criteria do not all prompt the same considerations, and are not listed in order of importance, which will vary according to the resource and its intended use. These four main criteria were blended carefully into the four stages of video production. Table 2 below shows the content of these 4 stages clearly.

	Stage 1 Development	Stage 2 Pre-production	Stage 3 Production	Stage 4 Post-Production
1	Story Development	Casting	Set Up	Editing
2	Treatment	Location Scouting	Rehearsal	Sound Mixing
3	Scriptment	Shot List	Setting Up Shots	Music
4	Plot Points	Script Breakdown	Recording	Test Screenings
5	Structure	Tech Scout	Checking Shots	Preview
6	Writing Screenplay	Scheduling		
7	Screenplay Reading	Costume Design		
8	Re-Writing Screenplay (if necessary)	Production Design		

Table 2: Stages of Video production

Every construct that has been mentioned earlier (content, instructional design, technical design and social consideration) has a role to play in the 4 stages of video production and should be considered seriously by the producers in the process of making educational video programs for the Malaysian digital natives. Table 3 below will further explain the embedding of these 4 constructs into the first stage of educational video production, which is the development stage.

3.1. Stage 1 – Development

Development is a period in which the video program’s conception takes shape and the foundational elements are assembled. The activities in the development stage may overlap at certain junctures.

STAGE 1 - DEVELOPMENT			
CONTENT	INSTRUCTIONAL DESIGN	TECHNICAL DESIGN	SOCIAL CONSIDERATIONS
-appropriate to student needs. -appropriate level of details -appropriate level of difficulty -assist students in achieving the prescribed learning outcomes.	-instructional goals and learner objectives are clearly stated. -methodology promotes active learning. -methodology promotes development of communication skills. - concepts are clearly introduced. -pedagogy is innovative. -adequate pre teaching and follow-up activities are provided.	-well organized and consistent layout. -clear materials with good visual contrast.	-organized sets of doctrines or ideas. -portray different age groups. -avoid political bias. -covers vast geographical region.

Table 3: Stage 1 - Development

3.2. Stage 2 – Pre-Production

In the pre-production stage, the producer starts to select key crew members and the preparatory stage of the video program making process begins in earnest. The blending of the 4 main construct into the pre-production process is elaborated in table 4 below.

STAGE 2 – Pre-production			
CONTENT	INSTRUCTIONAL DESIGN	TECHNICAL DESIGN	SOCIAL CONSIDERATIONS
-material should have significant Malaysian content and context. -resource is not outdated in its content.	- resource is suitable for a wide range of learning/teaching styles. - resource promotes student engagement. - resource is suitable for its intended purpose. - materials are well organized and structured. - materials have unity/congruency.	-visual design is interesting. -take full advantage of the unique aspects of media. -instructional material is best served by the medium.	-portrayal of gender issues should be relevant to the curriculum. -reflect positive awareness and sensitivity in the portrayal of diverse sexual orientations. -address socio-economic issues without bias to any community. -incidences of violence, where present, should be suited to both the context and the student’s maturity level.

Table 4: Stage 2 – Pre-production

3.3. Stage 3 – Production

This is the most important part of an educational video production. The filming and recording will take place in this stage. Basically, this is the stage where the program is created. As a result of this research, the 4 main constructs will form the backbone of the program created in this stage as shown in table 5 below.

STAGE 3 – Production			
CONTENT	INSTRUCTIONAL DESIGN	TECHNICAL DESIGN	SOCIAL CONSIDERATIONS
-content supports the integration of personal, familiar and cultural contexts of Malaysian society.	-resource encourages group interaction. -resource encourages student creativity. -resource allows / encourages student to work independently. -integration across curriculum subjects is supported.	-hierarchy of information and the relationship among ideas should be clearly communicated. -focus attention on the important content areas and are appropriate to the student's maturity level.	-characters should be multicultural and have valid roles and be seen to be participating in ways that recognize their value and meaning. -variety of aspects of native culture, language and history. -language should be suited to the context, maturity and intellectual level of the students.

Table 5: Stage 3 – Production

3.4. Stage 4 – Post-Production

After the filming and recording, this is the stage where the video program will get its full shape and structure. The program will be assembled by the editor. In this final stage of an educational video production, the four constructs are carefully blended into the images, footages, sound and visual effects to complete the task of producing an educational video program as shown in table 6 below.

STAGE 4 – Post-production			
CONTENT	INSTRUCTIONAL DESIGN	TECHNICAL DESIGN	SOCIAL CONSIDERATIONS
-content accuracy should be given serious consideration. -errors in spelling and grammar should be rectified.	- text relates to visuals. - adequate / appropriate assessment / evaluation tools are provided.	-material should be user friendly and easily understood. -components of the video should be packaged for easy access. -design is suitable for classroom and personal use.	-activities portrayed should comply with legal and community standards of safe practice and common sense. -integration of affective mediation should be considered.

Table 6: Stage 4 – Post-production

A completed educational video program should be evaluated by the Ministry of Education, Malaysia before it is approved to be uploaded to the www.eduwebtv.com website to be used by teachers and students. This task will be carried out by the Educational Technology Division (Ministry of Education) using their preview panel guidelines. Any challenges to the use of provincially “Recommended” learning resources will be addressed by an Educational Advisory Committee, composed of representatives of various divisions in the Ministry Of Education, Malaysia.

4. Discussion

The research found that there is considerable variation in the students' and teachers' judgements of acceptability of the constructs in the survey, providing evidence that at certain junctures the students and teachers are not confident of the ability of these educational video programs in guiding them in the digital era and catering for their 21st century learning concepts. However, a major part of the constructs in the survey has been accepted as important and concurrent to the needs of the students, teachers and producers that took part in the survey. These accepted constructs were concluded as important for their 21st century learning concepts.

The survey results shows that the prototype programs which are not current in their contents (outdated information) and supporting visuals have lost their educational value. Even the presenters of these programs are expected to be from the recent group of celebrities or show masters. The prototype programs received maximum positive comments for the use of statistics, accurate graphs, sophisticated models, examples or simulations and being error free of spelling mistakes or grammatical mistakes.

Teachers are very concern about these programs' ability to support the Malaysia Standard Curriculum. They expect the content to assist the students in achieving the prescribed General Curriculum Outcomes (GCO) and Specific Curriculum Outcomes (SCO). Where else, the students and produces expect these programs to offer them more than the curriculum. They expect the video programs to have the ability to link lessons to other relevant sites that will help them in requiring more relevant knowledge.

Scope and depth of topics that were selected for the production of prototype educational video programs have been commented to be not appropriate to all level of students. It is recommended that the production team consider treatment of topics that satisfies different

level of student ability. Besides being able to satisfy learning outcomes, the scope and depth of each program should be tailored specifically to suit different appropriate level of student's ability. The concepts, visuals, vocabulary, and internal structure should developmentally be appropriate and are meaningful to a broad range of abilities and achievement levels. These should also be accompanied by multiple levels of instruction to provide for individual differences in students.

The featured references, examples and analogies are preferred to be materials that have significant Malaysian context. Use of foreign references, examples or analogies seems to confuse the students and jeopardise the ability to understand and synthesize the information gathered from these videos. On the other hand, the use of educational video programs to link lessons to other external sites that will help in acquiring more relevant knowledge is greatly appreciated even though these external link programs might have the references, examples and analogies of foreign elements.

Students expect a 'real-world' experience in using these video programs, so do the teachers who are trying their level best to 'open up the roof of their classroom' to bring the world into their classroom. And the best way to do this is by projecting content that supports the integration of personal, familiar, and cultural contexts of Malaysian Society into the lessons. Links with 'real-world' activities should be incorporated, and provision is made for 'hands-on' experiences.

It is very important to explicitly state the instructional goals and learner objectives of any educational video program. Besides that, overall purpose of the resource should be concisely stated, if appropriate, with specific objectives stated for specific components. This will help the educational video programs make learning more meaningful and help improve the intended learning outcomes because students, teachers and producers have a clear picture of the intended learning outcomes. Eventually, they will prepare themselves to achieve the instructional goals because they are in the know of the goals and understand the need to prepare for it.

The hypothesis that was generated in the preliminary studies says shorter videos contain higher quality of instructional content designed. This was proven in the survey and obviously it takes meticulous planning to explain a concept succinctly. Due to that, shorter videos are more engaging, not only because of the length but also because of all the strategic planning in the production process.

The 21st century learning promotes and encourages students to work independently. This element can be implemented via educational video programs by allowing students to have some measure of control over the rate and difficulty of presentation and review. A few crucial points to be taken note will be to vary the genre of the materials and explore rather than be blocked into a linear instructional sequence. The order in which the information is presented should be logical and suited to the subject and objectives. The program should hold together as a self-contained unit and progression of the presentation should be smooth and logical, with new concepts identified in a clear and consistent manner.

It has been learnt from this survey that the visual design of these educational video programs should be interesting and effective. This includes high quality graphics (texts, flow charts, diagrams and tables), appropriate colour scheme and suitable sound and special effects. These elements are able to draw the student's attention to important points in the lesson (video programs). Materials should be visually clear, with a good visual contrast and the user interface should use interesting and topic-appropriate metaphors for the learning activity.

Generally, every student, teacher and producer of educational video programs are very cautious when they deal with the aspect of social considerations in the educational video program production. Controversial views and opinions should be presented with alternate points of view and suitable content. The suitability of material with the intended audience has been marked as one of the most important point in the social consideration construct. This includes the balanced geographical location, physical setting, time period and political and social context.

5. Limitations

12 prototype educational video programs were produced to be used in this research. These 12 prototypes were produced based on the initial Need Research Analysis (NRA) carried out with the students, teachers and program producers. Elements of the 4 constructs; content, instructional design, technical design and social considerations were scrutinized and applied in the production of the 12 prototype videos. Contrary to the Need Research Analysis that was carried out, the engagement findings might not generalize to all educational video watchers, since some students who are more likely to be self-motivated learners and technology early adopters might not be representative of the general online educational video program watching population. So, it is important not to draw any conclusions or hypothesis about students' learning solely from the findings about educational video engagement. The outcome of this research is to produce a conceptual frame work on production of educational video program and not to come up with a conclusion or hypothesis of what is the best way to produce an educational video program.

Educational video programs contain many components that impact learning and different kinds of students value different ones. Some students will find that a particular kind of video is suitable for their learning but the same video might not be suitable for another group of students. This is due to the different strategy of learning by different group of students. So, to generally mark down a certain video as not up to the standards of expectation will not justify all the hard work and planning that has been put in the production of that particular video. Every producer would have planned and produced the video to the best of standards. Flaws at certain part of the video should not be used to generally degrade the video. Instead, the whole video should be previewed as there could be some silver lining in that video that could be very useful or meaningful to the students or educators.

Malaysian Standard Curriculum covers a vast scope of subjects and content. It was difficult to produce prototype educational video programs that will cover the whole curriculum specifications. So, 12 subjects covering a unit per subject was planned and produced for this research. Some students were not happy during the data collection process because they couldn't find videos that cover their

favourite subjects or units. These students seem to have a negative perspective on the produced 12 prototype videos. Juxtaposition was seen in their way of answering the research questions where obvious positive elements of the videos were marked down by these students.

Finally, the infrastructure in the schools selected for this research plays a vital role in the outcome of this research. Due to unavoidable circumstances, some schools' computer lab and the multimedia equipment including the computers are in a dire state. A lot of special preparation was made in these schools to preview the prototype educational video programs but the outcome was a let-down because these students were just not interested in using these video programs in their learning process. Some of them even said that they gave up on computer assisted learning because of the bad condition of the lab equipment and internet condition. To make the situation worse, even the teachers were not in favour of using the video programs due to all the hassle that they have to go through in using video programs in their teaching process.

6. Suggestions for Further Research

Educational video producers need to continue conducting further research on self-motivated learners because these learners use a variety of resources in their learning process. This means they are not just depending on educational video programs to gather information and knowledge. So, it is important to find out their learning strategy and needs and incorporate those strategies and needs into educational video programs. This will attract the self-motivated learners to use educational video programs in their learning process.

The content of the prototype educational video programs used in this research are current and valid at the time of production and research. The Ministry of Education, Malaysia, have the policy of changing or altering the content of the curriculum after every 10 years in practice. This calls for a new research on the content construct of the conceptual framework produced from this research. Producers need to check the relevance of the old content and at the same time, need to identify the new content of the curriculum and check if it is possible to deliver the new content via educational video programs. The methodology and pedagogy of content delivery would have to be realigned to suit the new curriculum standards.

The population sample in this research was not divided into age groups, gender, ethnicity, geographical locality, social background and social status. Instead, the population sample was only divided into 3 main groups; students, teachers and program producers. This means that the production of specially tailored video programs to suit the groups mentioned earlier is not possible. In order to produce specific educational video programs for specific group of people, a thorough study is needed whereby the population sample is divided into the categories mentioned earlier.

Technology is never stagnant. New elements of instructional design and technical design will emerge every now and then. Producers of educational video programs will have to keep abreast with these new designs and implement them in their production. Continuing production with the obsolete instructional design and technical design will make the program uninteresting and out of date and even if the content is current, these videos will not be used in the learning process. So, obviously producers need to carry out further research on the instructional design and technical design construct of this conceptual framework.

Further research can also be carried out on production of educational video programs according to every subject that is being mentioned in the Malaysian Standard Curriculum. As mentioned in the limitations part, only 12 prototype videos were produced for this research and these definitely didn't cover all the subjects being offered in the curriculum specifications. So, further research according to subjects will shed more light for the producers to produce effective educational video programs in a vast variety of subjects.

As the country develops, there is a possibility that better multimedia infrastructure will exist in schools. At the best case scenario, students will no longer carry books and bags to school, instead their book is just a 'notebook' or a laptop or even a 'tablet'. In such a situation, students will obviously use a lot of on line study materials and educational video programs will be in great demand. This means, more need research analysis (NRA) is needed and more prototypes to be produced for the purpose of further research on developing the latest conceptual model for educational video programs production.

Social consideration of a country is never always the same. Government can change and new ideologies could be implemented as social consideration. Resources that support pro-social attitudes might not be suitable anymore or maybe more diversity promotion and human rights recognition would be needed. These calls for a revamp and further research in the social consideration construct of the conceptual framework that has been produced according to this research.

7. Conclusion

On line learning or e-learning is the preferred style of the 21st century generation. This research provided evidence that the students, teachers and program producers would tag along with this method of knowledge gathering and information delivery.

The conceptual framework for educational video production that was produced from this research will definitely be a guide to all educational video producers from the Educational Technology Division, Ministry of Education, Malaysia, in carrying out their task more effectively. Such a conceptual model was never made to guide these producers in this challenging field. As the reflections of the students, teachers and program producers in this research suggested, educational video programs integrated as an instructional strategy in classrooms in robust and vigorous ways will promote content learning for the digital natives.

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