Modular Multimedia For Drafting Course

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Abstract

Internet, Books and conventional strategies have long been considered as media for scrutinizing the groundwork of drafting lessons. Although conventional strategies are beneficial to students yet problems remain to be confronted such as time constraints, human limitations, disturbances and discomforts in the classrooms, unpredicted class suspensions, students' learning difficulties, and the need for intensive review of the lessons. The aforesaid problems can only be addressed by using an alternative/supplement teaching strategy that is simple yet substantial in the drafting course's teaching-learning process. In response to this, the researcher formulated the Modular Multimedia for Drafting Course to assist the students in their interest in technical drawing. The researcher employed a 30-minute conventional lecture versus a 30-minute video presentation experiment for the performance in the pretest-posttest and self-made questionnaire given for the acceptability. The results revealed that there has been no significant difference between the conventional and modular methods in performance. It was found out that there has been a significant difference in the acceptability level which is the modular method was higher in rating compared to the conventional one. This concludes that the Modular Multimedia for Drafting Course can be used as an alternative/supplement provided that the conventional method at any rate cannot manage.

Introduction

Man is basically fascinated with art. No wonder man is endowed with the skill of expressing oneself in the auspices of beauty and perfection. This would explain why art is practically manifested in anyone's daily life. On the other hand, art is practical when it portrays the graphic representation of reality, i.e., drawing. Drawing, be it freehand or mechanical, is properly depicted under the domain of drafting. It

means that drafting is a technical skill that requires imagination and knowledge to create things and inventions for a certain necessity. Thus, drafting as a whole happens when thoughts become things. Technical skills have commonly been studied by individuals or students who plan to work in the industry. This somehow paves the importance of nurturing the skill in technical drawing. The academe or an institution of learning caters the enhancement and development of technical drawing. Therefore, technical drawing is important because it is the universal language of the industry. Learning the art of drafting or technical drawing is not an overnight affair nor a semestral achievement, but rather a learning that has to be practiced for life with complete and standard guidelines. This thought was brought out by the researcher in the quest of aiding the students through enough and proper drafting lessons. Books and conventional strategies have long been considered as media for scrutiny sizing the groundwork of drafting lessons. Although conventional strategies are beneficial to students yet problems remain to be confronted for enhancement. These are when the instructor is running out of time to finish the course due to some other school-related concerns; when either the instructor or student is under pressure due to poor ventilation, acoustic, and other school-related problems such as unpredicted class suspensions; and finally, when there is a need for a thorough and intensive review of the lessons.

The aforesaid problems can only be addressed by using a technique or instructional material that is simple yet substantial in the drafting teaching-learning process. In response to this, the researcher is constructing the Modular Multimedia for Drafting Course to assist the students in their interest in technical drawing. Necessity is the mother of invention. This holds true based on what is observed in the massive production of new gadgets, the rapid rise of architectural structures, and the invention of highly industrialized machines. Likewise, the invention is possible only under the domain of innovative learning. Learning as an impetus of education is a pedagogical call to service. This means that a teacher must be creative enough to teach or educate his/her students. Moreover, education is a necessary and undeniable element of life, be it political, social, economic, or personal condition of improvement.   Mayer (2008), in his Cognitive Theory of Multimedia Learning, states that "People can learn more deeply from words and graphics than from words

alone". To be more effective graphics should be supported by a variety of sound and animation to make learning lasting and pleasurable.

This means that learning will increase as attention increases. According to Laired in his Traditional Sensory Stimulation Theory, as cited by Escaso (2012), effective learning occurs when the senses are stimulated. Stimulation through the senses is achieved through a greater variety of colors, volume levels, strong statements, facts presented visually, use of a variety of techniques and media (Lomarda, 2010). David Ausebel (1960) in his Meaningful Learning Theory further explained that to learn meaningfully, students must relate knowledge to what they know. This theory emphasizes that a person retains new information and found it meaningful with pictures and event organizers. Paivio's dual-coding theory contends that students can easily grasp objects when they are visually and verbally presented. This explains that learners are to transfer learning easily if it is presented through multimedia rather than mono-media instructions.

Alternatively, Howard Gardner, a renowned psychologist of multiple intelligences, says that everybody has strengths, weaknesses, and a unique combination of cognitive abilities. His pluralistic view of intelligence suggests that all people possess at least seven different intelligences that operate in varying degrees depending on each person's individual profile, one of which is visual or spatial intelligence. The above statement signifies that audio-visual presentation serves as an alternative approach to help learners appreciate and convey their interest. This kind of learning process can grab strong attention on the subject since they are able to organize ideas easily into knowledge that leads them to better understand abstract topics concretely. Drafting skills are strongly developed when it is done through self- progress where students decide and evaluate their own degree of understanding and the building up of their manipulative skills (McBeath, 1991). Dynamic interaction is still a prerogative when it comes to the acquisition of knowledge. This statement stresses that a learner is a purposive participant in knowledge- attaining process, who selects, structures, retains, and transforms informative data or instructions (Bruner, 1996). According to David Bagwell, as cited by Lomaad (1996), modular instruction came into prominence during the 1970s as one of the many alternatives to the traditional lecture method of instruction. The development of the module focuses on learning motivation in the sense that learning is typically individualized. The researcher goes on

to the camp of   Bagwell believing that learners likewise should be working one on one and be allowed to progress at their own rate. Thus, the present study Modular Multimedia for Drafting Course is itself a complete unit of instruction that requires Individual Development (ID), Campbell, 1996). Module-based instruction has advantages for students and teachers. Students can work at their own pace and assume responsibility for their learning. Likewise, teachers can be addressed any learning problem earlier and serve as resource persons (Lardizabal, 1997).

Azuelo (1983) contended that students who utilized self-instructional packages or modules obtained higher cognitive achievement than those who were taught under the traditional method of teaching. This claim is grounded on the idea that using modules is more successful in solving problems because one has a flexible understanding of his/her work. According to Garcia, as cited by Bueno (2000), a module is a self-contained and independent unit of instruction with a primary focus on a few well-defined objectives. It is a set of learning opportunities systematically organized around a well-defined topic that contains the elements of instruction, specific objectives, teaching-learning activities, and evaluation using criterion-reference measures.

Finally, modernity would tell us that the teacher is no longer the sole provider of knowledge but it is experience that guides an individual's attitudes, values, and decisions in his/her academic endeavor (Manalo, 1993). This claim pictures out that in the conventional method, students may not understand fully the lesson. On the other hand, in modular learning, students can be evaluated in accordance with their degree of understanding and self-paced. Thus, it is the student's active participation that determines the teaching-learning process.   Bueno (2000) in his Simplified Instructional Module in Drafting Technology asserts that modular instruments can increase the level of cognition and conceptualization in drafting technology. He further contends that modular instrument is an aid to substitute teachers in the absence of the actual subject teachers.

The aforesaid author introduces the book-type manual that would benefit the students in their pursuit of drafting skills and knowledge. On the other hand, this present study Modular Multimedia for Drafting Course is designed not only for classroom

settings but also designed intently beyond the corners of the room. It means that the above instructional material is digitally made for everyone who wishes to learn drafting skills and for anyone who wishes to review in his/her own right the know-how about drafting. According to Salandan (2006), technology-aided strategies are aimed at providing valuable experience through instructional devices that can be viewed and heard. The implementation of Republic Act (RA) No. 7722 known as the "Higher Education Act of 1994" is based on the updated Education Curriculum to be more responsive to the demands of a rapidly changing society and deal with worldwide competitiveness.

Section 10 of Article XIV of the Philippine Governance and Constitution states that Science and Technology are essential for national development and progress. The state shall give priority to research and development, invention, innovation, and their utilization; and to science and technology education, training, and services. It shall support indigenous capabilities and their application to the country's productive system of national life. The article includes its support for innovation and invention through which this study gives much importance. The present study is one way of generating our own technical mind for technical development. Thus, in itself, is for national development.

Further, section 12 of the same article states that the state shall regulate the transfer and promote the adaptation of technology from all sources for national benefits. It shall encourage the widest participation of private groups, local government, and community-based organizations in the generation and utilization of science and technology. Technology offers positive academic benefits for all students. Technological innovation is molding learners to be "creative and progressive". As with any curriculum innovation, the positive benefits of technology for student learning are influenced by different factors, including teaching training, administrative support, and state and local curriculum standards and assessment procedure.

This construction, beneficial to the drafting students, is a great factor that would encourage future researchers to invent or create new technological things for the sake of humanity.

The main task of this study is to construct and assess the performance of the Modular Multimedia Lessons for Drafting Course in Bohol Island State University, Main Campus Tagbilaran City in 2013.

Methodology

This study employed the Static – Group Pretest-Posttest Design: the experimental group (modular method) and the control group (conventional method). The profiling of both groups will be subjected to a pretest and posttest to evaluate the performances between the conventional instructional method and the modular-based instructional method. The researcher will also utilize the use of an observation guide to assess the performance of both methods. This study was conducted in the Drafting Technology Shop of Bohol Island State University, Main Campus, Tagbilaran City. This is the only university in Bohol that offers a Drafting Technology course.

The respondents of the study were the twenty drafting2 students. They will use both instructional methods during their drafting classes. The researcher purposively selected two groups of first-year drafting students (one group of ten students for the control set-up and another group of ten students for the modular instructional method) to avoid biases in terms of familiarity and expertise of the lessons. The selected students were chosen through grade pairing of their final grade of the 1st semester in the school year 2012-2013. Further, the researcher intently selects the first-year drafting students because the present study, i.e. Modular Multimedia for Drafting Course, is designed for complete and enriched lessons in basic drafting courses. The instruments utilized for the success of this study were a self-made questionnaire and the pretest and posttest. The modular multimedia lesson was played illustrating the textual presentation, images of different objects, and animations supported with an audio/video presentation. A self-made test was used for the pretest/posttest of both the experimental and control groups. On the other hand, the researcher utilized a questionnaire to assess the level of acceptability of the modular-based instructional method.

Procedure

Stage 1. Asking Permission

The researcher asked for permission and approval from the Dean of the College of Technology and Allied Sciences before the administration of the study.

Stage 2. Pretest and Posttest Administration
The selected students answered the pretest within 30 minutes before employing both the conventional and modular methods. After this, the researcher retrieved their answers for checking. The following day, the researcher facilitated first on the conventional method only for the ten (10) selected students assigned to it. It took 30 minutes and was followed immediately with the administration of the posttest for another 30 minutes. After this, the researcher collected their answers for checking. The same procedure was made for the other group of ten (10) selected students for the administration of the modular method.

Stage 3. Experimentation
The researcher checked the results of the pretest of all the student-participant. Each group (conventional and modular) was exposed to their respective method of instruction for 30 minutes. The modular method is designed for a 5-minute presentation. The researcher then designed the experiment by repeating the presentation six (6) times simultaneously to make it 30 minutes parallel to the conventional method. Eventually, the group, under the conventional method, was exposed to the modular method while the modular group was exposed to the conventional method for them to identify the difference between both methods. This was followed by assessing the acceptability level of both methods by all student-participant using the self-made questionnaire. On the other hand, the experts/instructors were given separate exposure to the modular method to assess its acceptability level by the use of an observation guide. The data collected were tabulated, computed, and analyzed. The data collected, tabulated, and analyzed were the bases for conclusion and recommendation. To get the performance of the students data will be treated by average weighted mean.

Table 1 Profile of the performance of the students' in the pretest and posttests based on their exposure to the Conventional method N=20

CONVENTIONAL METHOD

	PRETEST			POSTTEST		
Range	f	%	Description	f	%	Description
41-50	0	0%	E	9	90%	E
31-40	0	0%	VG	1	10%	VG
21-30	0	0%	G	0	0%	G
11-20	8	80%	F	0	0%	F
0-10	2	20%	P	0	0%	P
Total	10	100%		10	100%	

Table 1 illustrates the performance of the students' pretest and posttest upon the exposure of conventional method. The table reveals that majority of the students got low scores in the pretest and labeled as fair and poor. This means that the students have not yet familiarized the lesson being revealed in the pretest. On the other hand, after giving the discussion through the conventional style of learning, the posttest reveals that the students gained knowledge labeled as excellent and very good. This means that the students had improved their learning.

Table 2 Profile of the Performance of the students' in the pretests and posttests based on their exposure to the Modular based method N=20

Modular Based Method						
	Pretest			Posttest		
Range	f	%	Description	f	%	Description
40 -50	0	0%	E	9	90%	E
31-40	0	0%	VG	1	10%	VG
21-30	2	20%	G	0	0%	G
11-20	6	60%	F	0	0%	F
0-10	2	20%	P	0	0%	P
Total	10	100%		10	100%	

Table 2 shows the performance of another group of students based on their pretest and posttest result. The table reveals that only 20% got a good score while majority are said to be poor in the performance of pretest. This means that almost all of the students have not yet familiarized the lesson revealed in the test. On the contrary, after giving the modular method of instruction, it reveals that their scores have elevated to the top and labeled as excellent. This means that the

modular method offers them great help in accelerating their knowledge on Drafting lessons.

Table 3 Difference between the Performances of the Students Exposed to Conventional Teaching Method and Modular Based Method
N= 20

Variables	Computed "t" df 10, and df 20 at 0.05 level of significance	T-value	Description	Interpretation
A. Conventional Pretest & Posttest	17.73	2.28	significant	Reject null hypothesis
B. Experimental Pretest & Posttest	16.22	2.28	significant	Reject null hypothesis
C. Posttests of both groups	0.167	2.086	insignificant	Accept null hypothesis

As reflected in Table 3, the pretest and posttest for both the conventional method and modular-based method resulted in significant differences in their performances, attested by their corresponding t-computed value which is greater than the t-critical value with df 10 at 0.05 level of significance. Thus, the null hypothesis is rejected. The result reveals that there is a significant difference between the Performance of the Students Exposed to both methods of teaching as shown in their pretest and post-test results. It suggests that the Conventional method is traditionally proven an effective strategy. However, the posttest for conventional teaching and the posttest for the modular-based method reveals an insignificant difference in their performances. This finding implies that the modular-based method is as effective as the conventional teaching method. The said analysis is supported by Mayer (2008), in his Cognitive Theory of Multimedia Learning states that "People can learn more deeply from words and graphics than from words alone". To be more effective graphics should be supported by a variety of sound and animation to make learning lasting and pleasurable.

Thus, the modular method could be used as an alternative or supplementary strategy for teaching

Table 4 Acceptability of the Conventional Method as Perceived by the Respondents
N= 20

INDICATORS	W.M.	Description
1. Objectives		
1.1 It is easy to understand.	3.45	High
1.2 It guides in performing the activity	3.3	High
1.3 Easy to verify learning.	3.3	High
Average	3.35	High
2. Sufficiency of instruction		
2.1 instructions are fulfilled	3.45	High
2.2 only necessary information are presented	2.95	Fair
2.3 Possible interruption of instruction	2.7	Fair
Average	3.03	High
3. Generation of learning		
3.1 It is practical	3.2	High
3.2 It is applicable	3.3	High
3.3 It is beneficial	3.5	High
Average	3.3	High
4. Organization of content		
4.1 It is in proper order	3.3	High
4.2 It is simple and precise	3.0	High
4.3 It is comprehensive	3.0	High
Average	3.1	High
5. Audio Visual Presentation		
5.1 The audio and video are clear	3.15	High
5.2 The graphics are interesting	2.50	Fair
5.3 The animations are realistic	2.65	Fair
Average	2.76	Fair
General Average	3.1	High

Table 4 illustrates the acceptability level of the performance of the Conventional method. In terms of objectives, the conventional method is labeled high with a weighted mean of 3.35. This means that the said method is easy to understand and it provides guidelines for the activity, and learning is explicitly manifested. In terms of the sufficiency of instruction, the aforesaid method got the average rating of 3.03 with a qualitative description of high. This explains that the instructions and lessons are well illustrated, and that necessary

information is given. On the other hand, it is labeled "fair" in terms of "possible interruption of instruction" with a weighted mean of 2.7. This means that the conventional method is not at times convenient to employ due to ventilation problems, noise, and limited time in making visual aid. In terms of "generation of learning" the conventional method is labeled "high" with a general score of 3.3. This means that the said method according to practice has practicality and advantages. When it comes to the "organization of content", the conventional method garnered a general score of "3.1" with the qualitative description of "high". This means that the conventional method is organized, in some way simple and precise, and comprehensive. Moreover, when it comes to the "audio/visual presentation", the conventional method got "fair" rating in 5.2 with a weighted mean of 2.50.

This shows that the said method is inadequately interesting because it is by some means boring for the students. Finally, the total average weighted mean of the conventional method is 3.1 with the qualitative description of "high". It shows that the said method is good for it is already been tested for a long time. In addition, the acceptability level of the conventional method suggests that one should continue employing the said method provided that the visual aid is ready, the room is conducive to learning, and the instructors are well-focused on instruction.

Table 5 Acceptability of the Modular Multimedia for Drafting Course as perceived by the respondents
N= 20

INDICATORS	W.M.	Description
1. Objectives		
1.1It is easy to understand.	3.5	High
1.2 It guides in performing the activity	3.5	High
1.3 Easy to verify learning.	3.5	High
Average	3.5	High
2. Sufficiency of instruction		
2.1 instructions are fulfilled	3.25	High
2.2 only necessary information are presented	3.45	High
2.3 Possible interruption of instruction	3.1	High
Average	3.26	High
3. Generation of learning		

3.1 It is practical	3.1	High
3.2 It is applicable	3.75	Very High
3.3 It is beneficial	3.4	High
Average	3.4	High
4. Organization of content		
4.1 It is in proper order	3.35	High
4.2 It is simple and precise	3.3	High
4.3 It is comprehensive	3.35	High
Average	3.3	High
5. Audio Visual Presentation		
5.1 The audio and video are clear	3.2	High
5.2 The graphics are interesting	3.45	High
5.3 The animations are realistic	3.45	High
Average	3.36	High
General Average	3.36	High

Table 5 illustrates the acceptability level of the performance of Modular Multimedia for the Drafting Course. In terms of objectives, the modular method is labeled as high with a score of 3.5. This means that the said method is convenient to learn and not complicated, guides the students in their activity, and finally learning is clearly verified. In terms of the sufficiency of instruction, the aforesaid method again got the general score of 3.26 and was labeled as high. This explains that the instructions and lessons are adequately presented and that all necessary information is shown.

In terms of "generation of learning" the modular method is labeled "high" with a general score of 3.4. This means that the said method is perceived as practical to use as a learning tool, the lessons are very applicable in drafting enterprise, and it has an advantage when it comes to clarity and consummation of time in studying. When it comes to the "organization of content", the modular method garnered a general score of "3.3" with a qualitative description of "high". This means that the modular method is properly organized; it is simple and precise, and comprehensive. Moreover, when it comes to the "audio/visual presentation", the modular method got a "high" rating of 5.1 with a weighted mean of 3.2. This shows that the said module has clear sound and images. In addition, in terms of "the graphics are interesting", the module is labeled "high" with a weighted mean of 3.45. This means that the module is not only educative but it also catches the attention of the viewer's due to its

3D animated images. Thus, the formulated module boosts the interest of the learners. Finally, the total average weighted mean of the modular method is 3.36 with the qualitative description of "high". It shows that the said module is a good device for anyone who wants to develop their drawing skills. In addition, the acceptability level of the Modular Multimedia Lesson for Drafting Course suggests that it can be used as an alternative or supplement every time the conventional method is not manageable due to time constraints, irregular presence of instructors due to other administrative assignments, and most especially when there is unpredictable suspension of classes.

The following findings were basically based on the result of the statistical data:

1. As a result of the performance of students in the pretest and posttest, it was found out that both methods (conventional and modular) offers the students with accelerated rating. It was manifested that through the conventional and modular method 90% of the respondents got "excellent". This means that both methods are beneficial to students.

2. There was a significant difference between the performance of the conventional and modular method as attested by their corresponding t-computed value which is greater than the t-critical value with df 10 at 0.05 level of significance. Thus, the null hypothesis is rejected.

3. The acceptability level of the performance of Modular Multimedia for Drafting Course resulted to a weighted mean of 3.26 with the qualitative description of "high", when it comes to "Sufficiency of Instruction". This observation was the lowest rating garnered from the newly formulated method. On the other hand, the modular method acquired the highest weighted mean of 3.36 with the qualitative description of "high". This finding explicated that the modular method is far higher than the conventional method as far as acceptability level is concern.

The researcher wanted to emphasize that the newly formulated method is not only educative but it also catches the attention of the viewers due to its animated images.

Conclusion

Based on the findings, the researcher concluded that Modular Multimedia for Drafting Courses is beneficial and practical to students and instructors. Moreover, the said method can offer a parallel performance than the conventional one. Thus, the newly formulated

method can be used as an alternative/supplement every time the conventional method is not manageable due to various reasons which are inevitable.

Recommendation

Based on the findings, the researcher recommends to the following:

Students. They must use the formulated module if there is a need for a thorough review of the lessons.

Administration. The administration (BISU) shall strictly screen, implement and produce the newly constructed module through the Instructional Material Development Center so as to generate income for the university.

Experts. They must strictly screen the content, graphics, audio, and animation for enhancement to produce the best cinematography.

Instructors. The Instructors shall be trained on how to use and facilitate the module for it can be used as an alternative/supplement instructional package for a more effective academic endeavor.

Future Researchers. Future researchers may use this study if they wish to pursue a similar undertaking.

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