

## **PROPOSED INTERACTIVE MAP (MODULAR ACTIVITY PACKET): A TOOL FOR AN OUTCOMES BASED COMPUTER PROGRAMMING**

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**Abstract.** The main objective of this study was to develop and evaluate an interactive modules in Computer Programming. The researchers has chosen the faculty members and the students of the computer science department of the New Era University as the respondents to evaluate the developed interactive modular activity packet. The participants of the study were the freshmen computer science students who are currently enrolled in Computer Programming. Eleven (11) computer science faculty members were chosen by the researchers using the purposive sampling. The main instrument used in obtaining data required was a questionnaire due to its relatively faster collection of results. T-test was used to test the hypothesis that there is no significant difference in the assessment made by the faculty and student respondents in terms of the selected variables. Based on the result of the study, the criteria interpreted to be very good is the effectiveness of the modules. It tends to improve the students by demonstrating their competency. There is a significant difference between the Proposed Modular Activity Packet and Traditional Instructional Materials which is assessed by the faculty respondents. There is also a significant difference between the Proposed Interactive Modular Activity Packet and Traditional Instructional Materials assessed by the students respondents in terms of the selected variables. And there is no significant difference in the assessment made by the faculty and student respondents with regards to the proposed interactive modular activity packet.<sup>1</sup>

**Keywords. Competence.** An achievement to a specific degree of proficiency of the knowledge, skills, and attitudes acquired by a student in order to perform a given occupational task, and also frequently called skill.

**Curriculum.** A description or series of statement about what is to be learned by a student in a particular instructional program.

**Duty.** An arbitrary clustering of related tasks into a broad functional area or general area of responsibility. Duties are also called duty areas of competence.

**Instruction.** It is the process by which the intended learning will be achieved.

**Interactive.** A mutual action between the learner, the learning system, and the learning material. There is an immediate interface between the sender and the receiver in the communication process.

**MAP.** Modular Activity Packet, it is a term used by the researcher which stands for Modular Activity Packet (or Package) in Computer Programming. A MAP is a package of information and skills on a specific module. It has all the reading materials, activities, etc. included in the packet, or it may refer you to other resources such as books, video tapes, slides/tapes or multimedia.

**Module.** A learning package that usually includes enabling objectives and evaluation activities designed for individual or group for learning process.

**Outcomes Based Curriculum.** This is commonly referred to as a 'learner-centred' or student-centred' approach.

**Skill.** Denotes to anything that an individual has learned to do with precision with regard to either physical or mental performance. It refers to intellectual process that can be performed in a consistently, proficiency, and repeated performance.

**Software.** A set of instructions that direct the computer (Central Processing Unit) to perform a particular set of tasks in a particular order, using specified hardware devices, memory locations, and others.

**Step.** A term referring to the next level into which all job tasks maybe subdivided. Also sometimes referred to as activities, operation, and elements.

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<sup>1</sup> **Programmer.** It refers to the writer of computer programs.

**Task.** It represents a work activity that discrete, observable, and performed within a limited period of time, and that leads to a product, service, or decision. Tasks are also frequently referred to as the skills or competencies that students or trainees must possess in order to be successful worker.

**Usefulness.** The quality of having utility and especially practical worth or applicability. In this study, it is how the students perceived the usefulness of the developed manual.

## 1. Introduction

Interactive Modular Activity Packet is an alternative to the traditional approach to instruction that has too often meant frustration and failure for too many students. Interactive Modular Activity Packet acknowledges and, in fact, capitalizes on the facilitation of effective and efficient learning, which is relevant to the real world of work, by employing the learning principles of motivation, individualization, reinforcement of learning, self-pacing, recognition of different learning styles, provision of frequent feedback, opportunities for practice, and active participation. Interactive Modular Activity Packet differs significantly from traditional approaches to training because of the educational philosophy upon which competency based education is based. That philosophy stated very simply is as follows:

*“Almost all learners can learn equally well if they receive the kind of instruction they need.”*

To make that philosophy work, Interactive Modular Activity Packet uses a very systematic approach in implementing and delivering learning.

There are twelve factors that differentiate traditional instructional materials with Interactive Modular Activity Packet, these are the following:

- Traditional instructional material is content-based while Interactive Modular Activity Packet is competency-based,
- Traditional instructional material is time-based while Interactive Modular Activity Packet is a performance-based,
- Traditional instructional material is group paced while Interactive Modular Activity Packet is individually paced,
- Traditional instructional material is group needs while Interactive Modular Activity Packet is individually needs,
- Traditional instructional material is delayed feedback while Interactive Modular Activity Packet is immediate feedback,
- Traditional instructional material is a textbook/workbook, while Interactive Modular Activity Packet is modules and media materials,
- Traditional instructional material is limited field experience while Interactive Modular Activity Packet is learning in the field,
- Traditional instructional material is lectures, demonstration while Interactive Modular Activity Packet is assistance of resource person,
- Traditional instructional material has general objectives while Interactive Modular Activity Packet has specific objectives,
- Traditional instructional material has subjective criteria while Interactive Modular Activity Packet has objective criteria,
- Traditional instructional material has norm-referenced while Interactive Modular Activity Packet has criterion-referenced, and
- Traditional instructional material has final grades while Interactive Modular Activity Packet is learner competence.

Reforms are basically aimed to promote the implementation of Interactive MAP (Modular Activity Packet). These interactive modules are designed to help instructors and students learn new procedures of adapting Competency-Based Computer Education System. The purpose is to enable instructors incorporate the approach into-day-to-day instructional management activities when teaching.

The researchers adapted competency-based education system which they learned from the seminars conducted by the TESDA Group. Developing an Interactive Modular Activity Packet for the subject Computer Programming which is one of the key reforms in technical education and training. One of the key

steps in promoting this innovation is Competency-Based Technical Education and Skills Development (CBTESD) at our vocational and technical education institutions. Competency-Based Technical and Skills Development (CBTESD) is the term used to describe the TESDA way of adapting the Competency-Based Education (CBE) a vocational movement popularized in the west (United States and Canada) and Modules of Employable Skills (MES), vocational approaches popularized by ILO (International Labor Organization). Both approaches are now recognized to be the most responsive to the needs of the customer in the aspect of international competitiveness, private sector, government reforms, educational and training reforms, technology advances, emphasis on quality management, and new skills/multi-skilling. The education and training systems should begin and end with the customer's needs. And these customers are the agriculture, commerce, industry, and government. The needs are identified through a job analysis processor or what is known as DACUM (Developing a Curriculum). **DACUM** is a powerful alternative in developing a CBE programs that requires rigorous identification of worker competencies.

In the field of Computer Education specifically teachers of Computer Programming, must adapt an improved teaching techniques in delivering instructions for this subject. This is to develop and enhance their skills in the basic programming of computers and produce expected competencies students are required to attain. The researchers choose the subject Computer Programming in developing an Interactive Modular Activity Packet (MAP) because it is the basic core of an IT subjects. They intended to develop an outcomes based instructional materials for the said subject with a target occupation as a computer programmer. Why? It's because based on the researchers of TESDA, computer programmer's body of knowledge and skills covers only computer programming and does not include computer artwork, repair and maintenance of computer, secretarial jobs, and systems analysis. Computer Programming subject covers only the basics of computers programming. The index of knowledge requirements of a computer programmer are safety and health precautions, coding procedures, and the basic programming concepts. Mathematics, materials, its specifications and uses, and communications are also its index of knowledge.

The job description of a **COMPUTER PROGRAMMER** is to convert project specifications and statements of problems and procedures to detailed logical flow charts for coding into computer language. Develop and write computer programs to store, locate, and retrieve specific documents, data, and information. In particular, the computer programmer corrects errors by making appropriate changes and then rechecking the program to ensure that the desired results are produced. Conduct trial runs of programs and software applications to be sure they will produce the desired information and that the instructions are correct.

The development of an Interactive Modular Activity Packet for Computer Programming was the principle of this study. Its purpose is to guide and direct the students in acquiring skills and knowledge in basic computer programming.

The researchers, developed an Interactive Modular Activity Packet (MAP) for the following reasons:

- **Employment Opportunity**

Students should be given the opportunity to prepare for the specific job as Computer Programmer in the limited time they have.

- **Capability to Master**

Many students who do not possess the physical and/or mental capacity to master the task of an occupation could conceivably master the tasks of a particular job and,

- **Interest Limitations**

Many students have limited interests. They could be more motivated if they were presented smaller goals or allowed to experience more milestones during their tenure at the training center, jobs are smaller goals than an occupational.

The primary mission is to promote the quality of the instructional materials of Computer Programming for through appropriate instructional applications.

### **Illustrations**

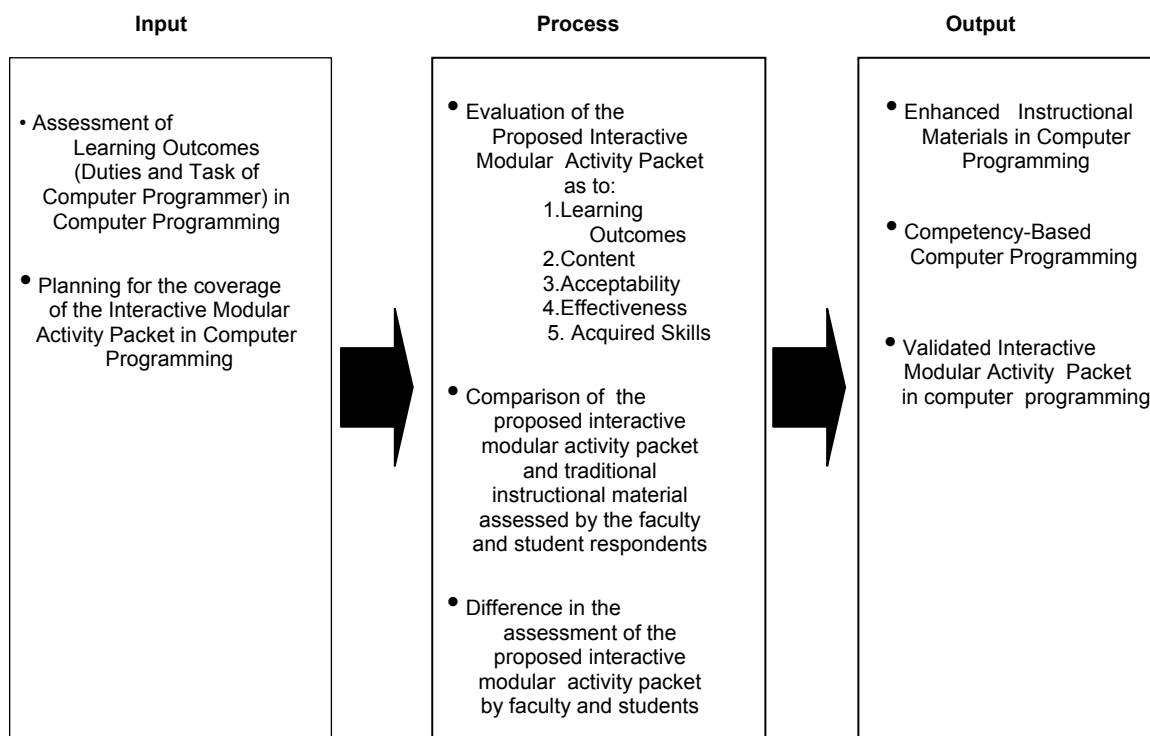


Figure 1. The research paradigm

Figure 1 illustrates how the study was undertaken and a proposed Interactive Modular Activity Packet was made. The research paradigm included Input Process Output (IPO) model in this study. Input process included identification of tasks which served as the learning outcomes to be achieved by the students, it is the process by which the duties, tasks and skills of a Computer Programmer are being identified, verified and validated by experts (TESDA Group), and instructional analysis, it is the process by which the curriculum outline and training pathway is being designed based on the standards derived from the task analysis. After developing the modules, the Process comes next which includes the evaluation of the proposed modules as to its learning outcomes, contents such as activity objectives, and topics' procedures, acceptability such as clarity, usefulness, suitability, adequacy, and interactivity then effectiveness, and acquired skills. A comparison between the assessment made by the faculty respondents and students' respondents Interactive Modular Activity Packet was made to evaluate the validity of the modules. The final stage was the Output process where a validated interactive module in the subject Computer Programming was produced.

## 2. Conclusion

The following are conclusions achieved in conducting the study:

The variables interpreted excellent are the following:

(1) Illustrations and interactivity show the concept of the topics which help the students to fully understood the procedures. (2) Acquired Skills meet the learning objectives of the modules. (3) Usefulness meets the learning experiences stimulate students' interest. (4) Learning Objectives describes the condition necessary for a student to complete a task. (5) Acceptability illustrates concepts, clarify instructions, useful learning materials, suitable procedures, and adequate activities which are appreciated by the learners, and (6) Topics' Procedures explains the activities and steps clearly. These suit the level of the students.

The variable interpreted to be very good is the effectiveness. It tends to improve the students by demonstrating their competency.

There is a significant difference between the Proposed Interactive Modular Activity Packet and Traditional Instructional Materials as assessed by the faculty respondents. There is also a significant difference between the Proposed Interactive Modular Activity Packet and Traditional Instructional Materials as assessed by the student respondents in terms of the selected variables.

There is no significant difference in the assessment made by the faculty and student respondents with regards to the proposed interactive modular activity packet.

### **3. Recommendations**

In view of the findings gathered, the researcher recommends the following measures and actions:

- The proposed interactive modular activity packet should be used by teachers in the subject Computer Programming with the main objective of preparing the students into a particular or specific job as Computer Programmer. After the student finished the seven modules, candidates should be tested for their competency as Computer Programmer should be required to show by written examination and practical demonstration that they are in possession of the knowledge and skills required in the standard of the industry.
- Teachers should be updated with the latest technology trends, strategies, techniques, and methods of applying technology in effective teaching through continuous seminars and trainings.
- There should be close coordination between the academe and the latest technology used in the industry especially in the field of information and communication technology.
- Other researchers should conduct related studies in designing and developing an effective instructional material such as a book or computer-aided instructions manual in which the major concern is to impart and upgrade the level of skills of workers in the Information Technology Industry with the end view of coming up with quality products/service, optimal use of equipment, tools and materials for increase of productivity.
- Other researchers should conduct experimental research as on the comparison of the traditional instructional materials and an interactive Modular Activity Packet.
- As more modules should be developed to enrich the proposed Interactive Modular Activity Packet.