BE -12

LEARNING ACTIVATORS TO ENERGIZE SELF-STUDY USING COMPUTER-ASSISTED MODULE (CAM)

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Abstract

The maturity in attitude of learning amongst students in higher education is marked by the right choice in making decision during learning. Students make decision in every step of learning process from deciding to attend a class or leaving the examination hall. The decision is well influenced by motivation. During a decision making in learning using Computer-Assisted Module (CAM), students have the power to choose when, where, and how to study. The power is again closely related to motivation. But what would their motivation be when reacting to difficulties? What are the activators to keep them active and motivated when using CAM? Therefore, the focuses of this study are to identify students' tendency in managing CAM; to determine their preferences in CAM; to obtain their reflections on learning using CAM. In this study, students were provided with a Computer-Assisted Module for topic Enzyme. The module contains adequate notes and questions that are aligned with the learning outcomes of the topic. They were given set of questions to provide their feedback on the learning activity. There were five aspects asked: managing CAM, comprehension, motivation, acceptance and preference. All responses were based on their perceptions. From those findings, learning activators are identified. These activators are useful information for curriculum designer to consider in their CAM designing as well for those who are in the open distance learning curriculum design field. Learning activators will help students to stay motivated and thus making not only right but good decisions.

Key words: Computer-Assisted Module, learning motivation, independent learning

INTRODUCTION

A young man with high rate of pounding heartbeat is standing at the edge of a cliff waiting for the right moment to launch a bungee jumping. That right moment would appear any time without any countdown or would never arrived at all. What makes the young man decided to jump? A little "push" perhaps, from the surrounding would accelerate the motivation to screaming for the adrenalin arousal right to the end of the bouncing. That little "push" does make a different to the big jump. A motivation drives many actions to fulfil one's goal. What makes a motivation valid for an action may be influenced by the forcing factor in the motivation. Here, this forcing factor is defined as activator. In learning, activators may resultfrom rewards, interest, preference or adaptation. Many learning approaches consider motivation as an aspect in engaging and driving the learning. Learning approaches that range from classroom interaction, field based learning or even e-learning approaches must have the element that can be labelled as the pushing factor, in this case, an activator. In human brain,

limbic cortex, amygdala, hippocampus and septal area are responsible in identifying emotions and motivation. Hippocampus connects senses and emotions, thus allow one to choose the best option in an action (Cherry, 2013). Hypothalamus accepts metabolic signals from endocrine, neural and other part of the brain to motivate an individual motivation and behaviour. The focus on learning and how to go about it are highly influenced by motivation (Pugh and Bergin, 2006). Students need the activating factor for them to influence themselves to jump into the unknown and new knowledge introduced and initiated by the curriculum or in a course unit.

Curriculum or the course unit is a critical tool to provide borderless learning opportunities in both conventional and using e-learning tools. Course designer should anticipate the behaviours that learners would compulsory have i.e., cognitive, psychomotor, affective and soft skills achievement. Bowman (2007) recommended extrinsic and intrinsic rewards to elevate students' academic attainment in personal, thoughtful and complementary way. Therefore, those rewards are seen functioningas an instinctive pride builder that activates learning activators. How does a learning module help a teacher to activate the student learning activators? Conventionally, in a classroom setting, a teacher has wider space to do so. How about if the module is introduce using a computer-assisted approach? Herman (2012) stressed that an educator should understand the alignment of pedagogy to the theories of cognition and motivation. Therefore, to creating a module, one must embed the learning activators to sustain the learning motivation. An important fact to be considered is the statement by Rock (2010), that social interaction in the classroom shaped the physiological and neurological reactions in students. The event of social interaction can be observed in a typical classroom setting, but how about in the computer aided learning setting? The interaction using e-media would somehow be lack of the actual human social interaction. Will this scenario alter the reactions in students?

We are all aware about the rapid and mass reformation in education, which everyone now is looking seriously at gadget aided learning. Classroom has changes from looking on the chalkboard to transparency to on-screen presentation and now, locking the eyes on gadget screen.To date, flipped classroom, blended learning and Massive Open Online Course (MOOC) are lining up in the glossary of learning and teaching, waiting to be debated, researched and redefined. Again, it is all about having students engaged and sustaining the motivation to learn freely without boundary. Computed aided module is at the top of the list to do when comes to the preparation of using such interface. Finding inspiring rewards to keep activating the learners to learn is also crucial in the design. Animation, forum, video, interactive, games, audio, simulation are amongst the widely used tool in e-learning.

Hamer et al. (2008) outlined a concept of five dimensions for classroom that use contributing student pedagogies. The five dimensions are deciding content, creating material, content delivery, formative assessment and summative assessment. These elements are developed to transfer the power of learning from the instructor to the students which giving them greater control in their own learning. Those elements or dimensions are agreeable to many as the purpose is mainly to shift responsibility of learning to the learners themselves. Students' motivation is elevated through providing them with the sense of ownership and personal purpose in learning. Therefore, we are clear about the needs for motivation in learning, but what would be the basic elements that activate learning? In this study, students were provided with a computer aided module that contain subject matters, formative and summative assessment and recommended sites for further exploration. Interaction between peers is not provided as the need to identify learning activators as to whether interaction is indeed an activator. There are three main focuses in this study, namely identification the tendency in managing CAM, determination of their preferences in CAM and the reflection on learning using CAM. The impacts of identifying those aspects are the ability to design a computer-assisted module based on the learning activators. Apart from providing learning opportunity, a curriculum designer will be able to design a module that contain a built in element that allow motivation and sustaining

engagement in learning via any gadget setting. Sirota et al., (2005) suggested that level of motivation in learners shall not only focus on how they are motivated but rather on how to deter educators from destroying students' motivation and morale through their practices.

RESEARCH METHOD

Students in their third year of Bachelor degree were provided with a computer aided module that contains subject matter on Enzyme, formative and summative assessment. They were allowed to study in their own paces and at their convenient. They were supplied with a set of survey questions that was administered using an online survey tool. The questions asked revolve around how they manage CAM, comprehension of the topic, motivation, acceptance and their preference. All responses were totally based on their perceptions. Data from the managing CAM shall provide information including on how they manage self-study using CAM, preferred environment, and time-taken to do study the CAM. The comprehension of topic contained their declaration on their understandings and their actions when encountered any problem in comprehending the content.

In this study, motivation aspect revolved their agreement to the motivating CAM and their recommendation in other topics. Acceptance is another aspect that circled their reflection on the best and the worst part during the self-study using CAM. And the final aspect is preference. Preference in this study is their inclination in the content format, their needs and type CAM line up.The line up is deliberately designed in a basic CAM, which only involves content-activity-assessment as the major element. Capturing interest is planned such way to get the students engage in the topic which is done by displaying the everyday life phenomena for them to ponder. Then the students will be introduced to the purpose of the learning by sharing the expected outcomes. The CAM started rolling using content-activity-assessment format, where students will be provided with facts, activities to enhance thinking and assessment to strengthen understanding. Social interaction is designed by having them to complete selected activities with peers. Useful sites and current issues were made available in the CAM. A take-a-break prompt note is set at the middle of the CAM.At the end of the CAM, a reflection question to the learning is placed to guide students to look back at the learning process and how it benefits them. The time for the self-study was set up to one week. Finally a link to a survey question set is uploaded in MyGuru2, i.e. the SIEU portal learning management system. Data were collected and analyzed using statistical software. The line up concept of CAM on the topic Enzyme line up is as Figure 1.

Capturing interest	• Stimulate thinking by asking questions on the real life phenomena regarding enzyme
Introducing expected outcomes	• Listing learning outcomes
Content- Activity-Assessment	• providing content information • activities related to learning outcomes • assessment based on activity
Break	• Alerting student to have a break
Content- Activity-Assessment	• providing content information • activities related to learning outcomes • assessment based on activity

Content- Activity- Assessment Reflection question	- providing content information - activities related to learning outcomes - assessment based on activity - learning reflection

Figure 1: The Enzyme CAM line up

RESULT AND DISCUSSION

Students were provided with a basic computer-assisted module on topic enzyme, which contains topic content, individual and peer activities, and assessment. Students were given one week to complete task and to submit the evidences. They filled up the questionnaire to give their feedback on the learning. The main purpose in this study is to identify the learning activators as preferred by the students. The three elements to be discussed are, managing CAM, determine preferences and obtaining their reflections.At the end of this discussion, an idea of learning activator component is proposed.

Managing CAM

There were five aspects set in this element, which are, their preferred time to study the module, study location, duration of study per session, practicing revision and the approach taken in studying. 57.1% of the students preferred to study the module during the weekend as they can study the materials in their own paces. However, 28.6% admitted that they study during their free time in any weekdays. A computer-assisted module should provide a non-threatening environment, which will allow student to plan and have authority in managing their learning time.Keller (2008) stated that delivering instruction using e-learning environment should be able to motivate learners by analysing the environment of learning, which may include instructional materials, delivery system, and learning condition. Therefore, in designing such curriculum, one should consider a non-threatening situation to promote internalization of learning.It was found out that, majority of the student (96.4%) study the materials in their hostels. In SIEU, student residences are provided with Internet connection, which is playing a very crucial and imperative role in supporting learning using ICT.

About 57% of the students spent one to two hours per session while the rest used two to three hours per session. They opted to spend longer time when they need to repeat the module or search for more information. This is evidence when 82.1% of them studied the module for more than once. This is the reason why 50% of them use the approach of "Follow Instruction and Repeat" compared to "Browse all and Start" (28.6%). Alert, it might be the reason of CAM limitation. Students did not have the chance to see the whole picture of the module which drove them to follow the instruction stated in the module and revisited the module again. To a certain extent, it will be good strategy to 'force' them to revise, however, getting them to understand the field before exploring the grass would be a motivational and reducing the load of anxiety to what is coming next. Some students took the move of browsing the module before starting the module. It is a learning approach that should also be encouraged among students and a curriculum designer. As researched by many, a learning that focused towards student, has been reported to improve learning and performance (Costa and Rangachari, 2009; Preszler ,2009; Zher, 2011).

Preference

There were three aspects to define this element, namely, the component in the module, their perception on CAM and the line up framework in the module. The students found that learning the topic enzyme using CAM had given them some benefits. Figure 2 shows the ranking of the benefits as chosen by the students. The CAM allows self pace is placed at the

highest ranking by the students. This indicates that learning in a comfortable environment is highly agreed compared to other aspects asked. The students picked "encourage revision" as an element preferred in the provided CAM. The option matched with the majority of the student (82.1%) repeated the module.
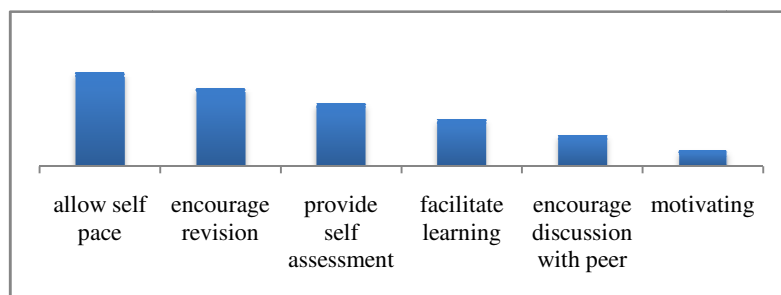

Figure 2. The ranking of benefits found by the students during the learning starting with 'allow self pace' as the highest

This study also managed to capture the students' feedback on motivation. Among the feedbacks were, facing the boredom when studying alone, disturbance from their surroundings, the self pace may also hinder their motivations, not confident in their learning as they felt that they need a face to face interaction with the teacher, they still confused with some information in the internet. These claims were clearly indicated the downside of a CAM.As there was no instructed discussion with the teacher, the students felt no motivation of experiencing the CAM even though they have abundance of resource in the internet or the library. Being confident in transforming facts to knowledge is an important element in learning.Even though, self pace is selected as the highest rank in their preference, they agreed that to a certain extent it will become a motivational challenge. Therefore, an instructor should consider guided time spent for the students as an extrinsic motivational factor. The students agreed that they need session of discussing with the teacher (66.7%) as they preferred to have a face to face discussion rather than to seek answers and explanation even from reliable resources. By having the session they believed that they will become more confident to change facts into knowledge as they will apply them during the laboratory session in the following week. The dependency of discussion, however, is not indicating that the students were not ready as independent learner. When asked what they wanted to see in a CAM, Figure 3 summarized their suggestions.
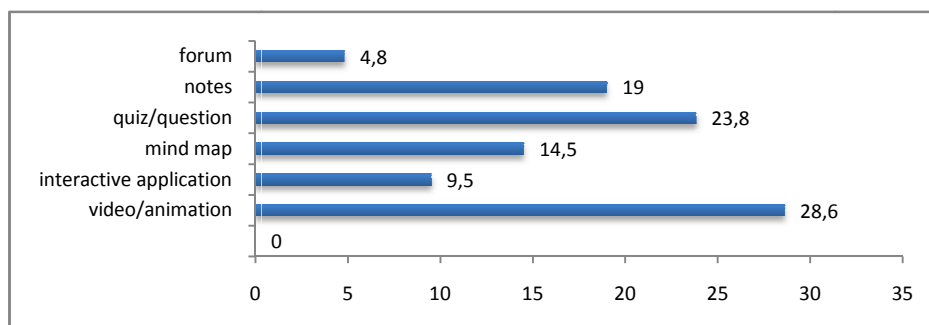

Figure 3: The percentage of student suggesting the component needed in a CAM

Animation reduces cognitive work as one can comprehend without having to putting

facts into imagination. Video, animation, simulation are among the medium that help student to understand better. Bruna (2013) found that using art presentation in learning Biochemistry was successful as an approach to motivate the students as they help understanding and learning Biochemistry. Bruna (2013) had shown that there was a positive relationship between art and science in enhancing self-learning. Thus, in designing a curriculum, the choice of medium is an important factor to be considered. The students preferred to have quizzes, exercises and questions as their check points to the understanding. Assessment shall give the students a fast feedback or indicator to their performance and comprehension. Students may learn from those instruments, while measuring their own achievements. Another point to discuss is their preference in having mind map as an element in a CAM. Mind map is claimed to have the power of memory enhancement, regardless of the claim, it showed how important to student to have a clear overall picture of what they are getting into. The line up in a CAM should consider a mechanism or an approach to introduce the overall picture to the students. About 51.9% students chose the cycle of Note-Assessment and 40.7% students selected the cycle of Note-Formative Assessment as the format in a CAM. This indicated their preference in having summative assessment and formative assessment through out the learning session.

Learning reflection

The third element in this discussion is analyze based on their reflection on best-worst experience, understanding and motivation. The students stated that CAM has encouraged them to seek for new information and they had encountered new things which has amazed them. In other words, CAM promote learning motivation indirectly. In more direct ways, CAM activities were thought to boost their thinking as their feedbacks stated that CAM activities and assessments challenge problem solving skills and allow self assessment to be done. The activities in the provided CAM were encouraging inquiry in them as the activities were closely related to their everyday life phenomena. Thus, they were motivated to explore deeper into the content. They claimed that the provided CAM contained assessment that is aligned with the content and activities designed. Thus, they became more confident in the learning. The interface of CAM supported learning through the color, animation and sound. These should provide more exciting and yet a relaxing learning environment as stated by the students. Another important feedback obtained from the students is, CAM gave them authority to manage their own learning in terms of time, mood and focus. They could pick any topic to focus at their own pace and repeat the study as their wish anytime, anywhere. Many instructors are aware of the safe learning environment, but how many of them really understand and plan the needs. For instance, students need CAM with a clear instruction but not with restrictions and recommendation to facilitate their resource search. When teacher tells students to do research in a specific topic, does he guide them with the how-to? Migrating from a conventional teacher's show classroom setting to DIY classroom is a grand leap in this century, however the leap will fall bad if a teacher is not there to prepare and guide the leap.About 78.6% students admitted that they understand almost all contents, whilst 21.4% agreed that they understand all contents. The students strategized their actions when encounter with problem by using internet (39.5%), reference books (29%), or by referring to their friends (13.2%). This is a very strong indicator for CAM developer to include references in the line up. The CAM module is considered motivating as total of 92.8% students agreed to it. About 64.3% students declared that they want to experience the same mode of learning in other topics, whilst 10.7% will do that only to selected topics. The acceptance of using computer and other gadgets is significant in the era of ICT. As flipped classroom, blended learning, online courses and computer assisted module are emerging rapidly, curriculum designer and courseware developer must compose a learning tool up to the education requirement and value, and motivate learning.

Learning activators

Many curriculum designer or coursedevelopers have produced wide range of computer-aided module covering almost all topics we can name. Nowadays, the education industry has been seen as an economic resource as the market shelf is fast filling with educational application. The main target user is the student. As researchers all over the world are working hard to understand learner and develop the best teaching mechanism or learning approach just to get the student learns, one must also look at the element that activates learning. In this study, an idea of learning activator is proposed. From the data obtained, there are three general activators discovered. Figure 4 summarized the proposed learning activator that must be taken into a serious consideration as a course designer when designing a module. The activators detected from this study are categorized into three, namely, Safe environment, Effective Learning Process and Module and Post Module Support.Safe environment should be applied to avoid student frombe caught up with boredom, stressed and not motivated with too many dos and don'ts. Facilities that support learning should be considered, for instance, the easy downloading method, Internet access, available online resource, updated operating system and compatible to most gadgets.An effective learning process is a compulsory and is the heart of a CAM. As discovered from the students' feedback, the self pace mode is preferred by all. However a guided self pace where atime spent can be recommended in a certain section in the module or suggested duration to complete and submit all activities, is an advantage for them to help with their time management. A CAM is preferred to have an interactive component, thus leaving an option of using online feature as the only choice. Students were motivated when the assessment is closely related to what they have learned, therefore the formative assessment design must aligned with the theme of activities. Activity involving real life phenomena is taken seriously as motivating factor by the students, should be seriously considered in the module as well. Since the students are exposed to a massive resource, referencing is a helpful for them to decreasing the chance of frustration in the search of the right information. Majority of the feedback still need the face to face interaction with their teacher. Even though technology nowadays allows video conferencing, video call, texting and messaging, but still student needs the human touch in doing the explanation or a discussion.
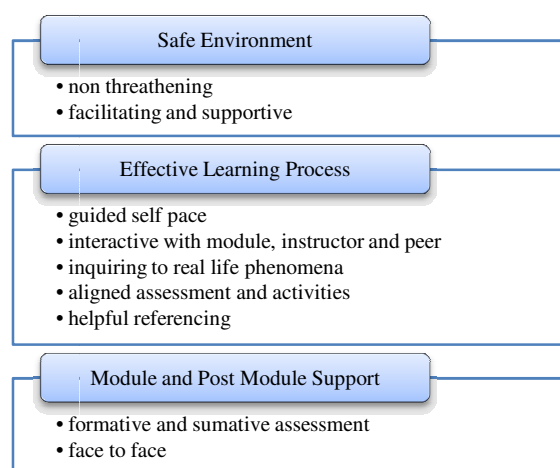

Safe Environment
• non threathening
• facilitating and supportive

Effective Learning Process
• guided self pace
• interactive with module, instructor and peer
• inquiring to real life phenomena
• aligned assessment and activities
• helpful referencing

Module and Post Module Support
• formative and sumative assessment
• face to face

Figure 4 The summary of Learning Activators that is proposed to help safe learning in a Computer Aided Module (CAM)

CONCLUSION AND SUGGESTION

As the idea of learning activators is proposed, further research should be done by developing those activators into a computer aided module, and to check the level of motivation and the sustaining of learning interest as well as the achievement. A student's needs changes from time to time, especially when technology and innovation help shapes the learning environment. As long as the student learns, any approach of teaching and learning is unquestionable. However, having an inner strength in a student to maintain motivated and sustain the interest to learn is another big issue and responsibility for a teacher. A responsible teacher would always find the learning activators and have it placed wisely in the teaching and learning process. By doing so, the student would travel deeper into the field of knowledge confidently. As the bungee jumper endsa jump, he knows what it takes to push him to jump and to expect an adventurous journey without being force into.

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