Reconceptualizing a Creative and Specific Learning Environment by Using Web-Based Automated E-Quizzes as a Guiding Tools for Accountable Study Behaviour

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Abstract. Web-based automated e-quizzes provides the better ways to transform a creative learning environment to ensure students can manage learning by reinforcing their practices through e-learning and guiding their study behaviour towards the demand for improving quality education. This paper proposed a specific focus on using Web-based automated e-quizzes exercises system (WE system) as an enabling automated learning environment to monitor and guide students' self-study and revision, with an approach of 'Assessment For Learning' as a learning process, and the design of using this WE system will be in line with the four required aspects under the paradigm of our HK Government's Qualifications Framework in Education. This pragmatic approach is used to cultivate and reinforce students' accountable study behaviour. Whether this approach of using WE system as compulsory or supplementary in the practical sense of operation or as a catalyst for cultivating student's study behaviour in the process of learning are further discussed, together with different integrated conceptual frameworks of learning and study behaviours are being empirically reviewed.

Keywords: study behavior, web-based e-quizzes, accountable learning.

1 Introduction

As the advancement of technology becomes more mature, the utilization of educational technology to optimize teaching and learning activities is now a worldwide phenomena for using such creative and specific learning environments. Many studies have been conducted with research efforts to determine the impacts of web-based automated learning tools for supporting various functions in education.

There is a need for ongoing guidance and support to monitor students' learning activities in a more effective means for tracking outcome of their study behaviour. Moreover, the utilization of this proposed Web-based automated e-quizzes exercise system ("this WE system") can also facilitate our role and function in programme monitoring into a more effective means in enhancing and shaping students' way of learning and the subsequent trends of their resultant learning outcomes are also being easily identified. This proposed WE system can also serve as the measures for guiding

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students' study behaviour in the process of doing revision in an ongoing and regular basis, as in accordance with the expected quality criteria of estimated and required self-studying time, which was generated in compliance with the HK Government's Qualifications Framework System in Hong Kong Education Bureau.

Nowadays, the students are becoming increasingly exposed to Web-based environments for automated learning, and how willing did students interact with Web-based environments in their automated learning practices, and what are the determinants of students' study behaviour in web-based practices for learning will be discussed from the perspectives of different theoretical models of empirical reviews and literature studies.

Smith pointed out that most behaviorists also reckon the students' learning process can be viewed as a change in behavior and the learning environment should be arranged to elicit the desired responses through such educational devices or tools as behavioural objectives for competency-based learning, and training for skill development [1]. Kim and Axelrod agreed that the educational approaches such as applied behaviour analysis and curriculum-based measurement should be embraced with a direct instruction of learning criteria served as the accountable task that students could be engaged in during their studying, including the use of this proposed WE system for automated learning, as an integral part of students' commitment to be involved into this guided episodes of learning [2].

A good quality education should be and is one that enables all learners to realize the capabilities they require, and therefore the infrastructure of the inter-related environment must be sophisticated enough to blend our educational practices and needs from both perspectives of pedagogical effects and technologically capable environment, in order to enable an accountable interventions for the students' learning process. And therefore, this paper proposed a WE system and employed strategy to re-engage students for such an accountable learning, under this WE system as a homework approach of 'Assessment For Learning' with built-in conceptual directions as expected and required from the 4 aspects: (i) Knowledge and Intellectual Skills; (ii) Processes; (iii) Application, Autonomy and Accountability and (iv) Communications, IT and Numeracy, under the paradigm of the HK Government's Qualifications Framework in Education (HKGQF). The enabling factors will be discussed in order to cultivate an accountable learning by shaping students' study behaviours with this proposed WE system.

In another word, this outcome-focused learning can also be seen as interactive activities between parties-involved within our educational system, which specifically responsible for blending education as accountable learning in practice by making use of the technological tools, with the intended purposes of integrating the four required aspects under the paradigm in our HK Qualifications Framework in Education, as part of my newly constructed concept of "Knowledge about knowledge" as an interventional strategies of the automated learning with the approach of 'Assessment For Learning' via this proposed WE system.

This of my concept of "Knowledge about knowledge" is derived from the required quality standard of outcome-based/focused learning, together with policy implications of the explicit and implicit conditions from the rule-based and principle-based opera-

tional system, which also in line with the paradigm of HKQF, through the embracement of technological educational tools as the platform to equip the pedagogy needs and quality expectations of the Intended Learning Outcomes (ILO) for blending accountable learning in practice, as in this concept of interventional strategies. One of these efforts in this paper is to discuss different theoretical frameworks that permit a more systematic accumulation and evident-based research studies to support and guide the design of effective educational practices by using this proposed WE system, to produce efficient efficacious and effective quality learning for the ultimate educational goal at large.

In support of this ultimate educational goal, the basic and balanced flows from different levels and aspects of knowledge learning is an important determinants in mounting my constructed concept of "Knowledge about knowledge" as an interventional strategies. Through this transformative automated learning activities that specifically designed to encourage an accountable study behaviours in learning, as in line with the ILO that generated in the fulfillment of the four required aspects under the paradigm of the HK Qualifications Framework in Education, which in turn, should be incorporating with different levels and aspects of knowledge learning, namely with the following components and focuses on:

- Declarative knowledge(knowledge-zero)
- Cognitive knowledge (know what)
- Procedure knowledge or Applied skill (know-how)
- Reason knowledge or Systematic understanding (know-why)
- Condition-knowledge (know-when)
- Relation-knowledge (know-with)
- Affective-knowledge (ways to learn knowledge)

As a result of such advances in information technology in education, this proposed WE system, should become an integral part of our educational system, which allows and optimizes the desirable functions to serve the vital role in the areas of reconceptualizing a creative and specific learning environment by using this proposed Web-based automated E-quizzes exercise system to, yet again, encourage an accountable study behaviours in learning.

2 The Effective Use of this WE System – Creating Accountable Automated Learning Environments

This paper proposed the use of this **WE system** to guide study behaviours and translate such usage into educational practice for encouraging students' study behaviours in doing e-quizzes exercise as their revision or homework and which is part of the integral informal 'Assessment for Learning' strategies on a continual and regular-basis to promote students' accountable learning habits.

The principal characteristic of utilizing this WE system is embedded with 'Assessment For Learning' Strategy as an accountable educational practice for their

educative automated learning that blended with pedagogical criteria with built-in concepts of an innovative technological tools for:

a. reinforcing students' practices of utilizing the existing e-learning online tools;
b. doing and performing revision as their homework on regular-basis via the Web-based automated e-quizzes exercise system, the WE system;
c. facilitating e-based monitoring students' pattern of learning activities;
d. providing effective means for tracking students' learning outcomes and their progress; in which it can provide the monitoring capability of checking who has read, and also automated e-quizzes to determine whether the learners have grasped the contents of learning materials;
e. integrating the four required aspects as in the paradigm of HKGQF in Education into this WE system.

A parameter to identify the situation by simply observing the records in data log, in which each data log gives an indication related to: (i) overall interaction frequency of log activities; (ii) overall pattern of e-quizzes attempts; (iii) knowledge ability in the overall results of attempted e-quizzes, as the basis for indicating students' study behaviours. As Cocea and Weibelzhal pointed out that log activity has been considered as a source of information for assessing students' motivation [3]. Furthermore, many educational theorists and researchers consider learning styles as an important factor in the learning process, as learning styles can be seen as "a description of the attitudes and behaviours which determine an individual's preferred way of learning" and agree that incorporating them in education has potential to facilitate learning for students [4].

In order to support students' e-Learning process, Sfenrianto, Hasibuan and Suhartanto proposed the Triple-Characteristic Model (TCM) in e-learning system [5], in which the e-Learning process should accommodate students' in their (i) learning style, (ii) motivation and (iii) knowledge ability embraced as their personalized learning activities.

In this sense, it further sustains the usage of this WE system in an on-going and regular-basis for facilitating such blending into educational practice and guiding students' study behaviour by providing the stimulation of innovation that embedded with the overall benefits of flexible accessibilities that makes catching up and following-up possible at an individual student's own pace of learning for supporting their process of learning activities, as well as allowing the effective use of time with automatic and instant feedback that makes students' self-review or self-evaluation possible.

3 Determinants of Study Behaviour as an Accountable Automated Learning in Educational Practices

In fact, there are many influential factors affecting students' attitudes towards any ICT-based or Web-based learning interactions and choices in real pursuit of e-learning literacy, as Eke in her research question also asking "What is the best group of factors that can be used in predicting students' intentions to adopt e-learning?", in which she found

factors such as 'attitudes towards e-learning'; 'intention to adopt e-learning'; 'availability of resources'; 'pressure to use e-learning'; 'ease of e-learning use' and 'usefulness' would affect the students' intention to adopt e-learning practices [6].

Lu, Stokes and Zhu generated a MUST Model to analyze a Web-based Learning Process, in which they propose four key elements that impacted students' web-based learning practices, which composed of **M**otivation; **U**sage; **S**atisfaction and **T**ask performance in their MUST model [7]. Smith et al describe the learning style theory as the individuals learn in different ways that can be categorized into four distinct learning styles, namely – feeling, watching, thinking and doing, in which they found that knowledge of a learner's preferred learning style, will lead to faster and more satisfactory improvement in facilitating their e-learning practices [1].

As according to Ndubisi, the factors that affect students' intention to adopt e-learning practices by using the Decomposed version of Theory of Planned Behaviour (DTPB), in which he illustrates specific salient beliefs that may influence technology usage in his research framework as shown in Figure 1 [8].

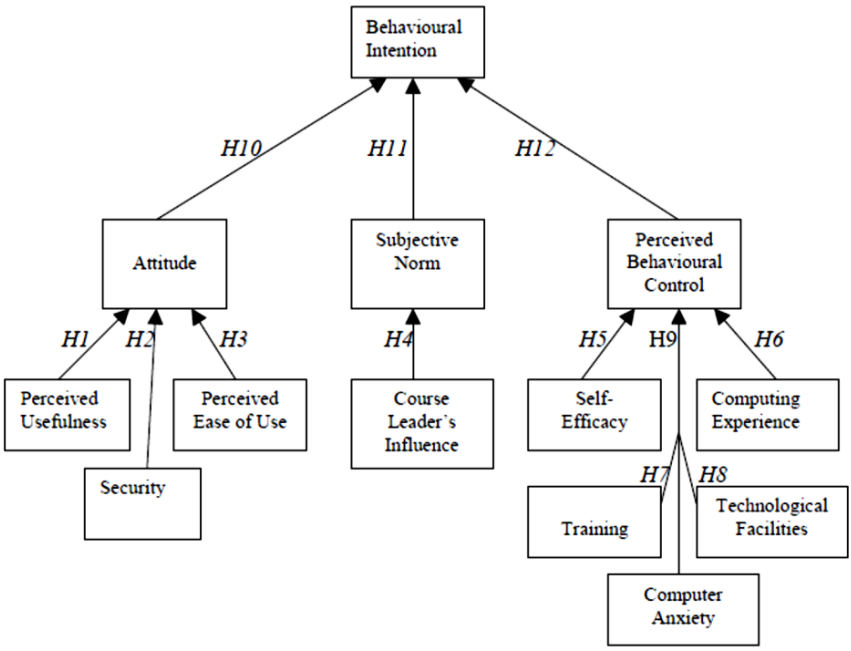

Fig. 1.

Kraft, Rise, Sutton and Roysamb tried to identify whether behaviour was regressed on intention by using the theory of planned behaviour (TPB), in which it indicated that no interactions between attitude and perceived behavioural control (PBC) components in terms of predicting intentions were being identified, and no interaction between intentions and PBC components in predicting behaviour were identified

neither [9]. Whereas, Siragusa and Dixon highlighted merits of this application of the TPB and subsequently anticipated the need to continue trialing of this theory of planned behaviour as it pertained to the practice of ICT-based interaction in e-learning [10]. Siragusa [11] has adopted Hrubes, Ajzen and Daigle, 2001's conceptual framework of TPB is shown in Figure 2.

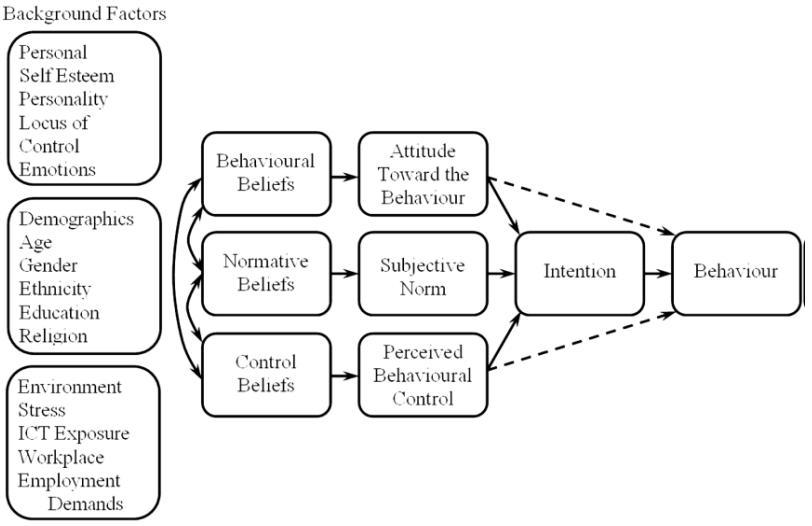

Fig. 2.

Jan, Lu and Chou have explored several models in their research study in order to generate the understanding of e-learning's acceptance as environmental factors for promoting the beliefs in the adoption of e-learning practices [12]. They further illustrated there are two systemic beliefs in Technology Acceptance Model (TAM) that included (i) perceived usefulness and (ii) perceived ease of use are the determinants of students' attitude for the adoption of using e-learning practices. However, those two proposed determinants of attitude are only on technical and individual level factors.

In this study, they [12] in fact, has also postulated a significant factor of institutional forces is the most important determinants of attitude on the adoption of e-learning practices. This Institutional Theory accentuates the significance of the institutional environment as to the students' attitudes and their subsequent study behaviours and practices in using e-learning. They have further agreed and cited there are two types of coercive pressures that exerted on the students' attitudes, behaviours and practices, which are regulations and competition.

According to Ndubisi [8], understanding the factors that influence intention to adopt e-learning in general will help to create a more favourable environment for greater adoption, as well as helping to design strategies to promote such study behaviour in the usages of e-learning practices. Evidence from [13] has also organized a study with the purpose of identifying factors that can affect learners' readiness and

adoption of e-learning practices and subsequently suggested certain criteria for making the successful implementation of e-learning practices in an educational system. He further proposed the focus of those criteria including (i) the acquisition of adequate technological infrastructure (ii) an adequate educational content of learning, and (iii) a developed culture for such learning activities, including sharing of knowledge and skills.

In the study by Phillips, McNaught and Kennedy [14], they reckoned that learning processes are the ways in which students engage with the learning environment and the learning activities embedded in it may also include interaction between students and technology, in which they have produced the LEPO framework to describe the characteristics of the learning process, as shown in Figure 3:

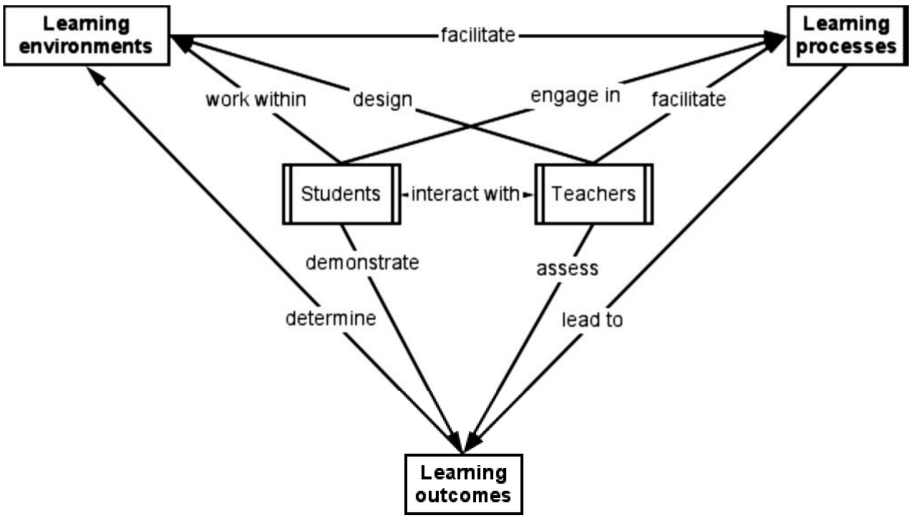

Fig. 3.

In this Figure 3, the LEPO framework is showing the interrelationships between learning environments, learning processes and learning outcomes. It "conceptualizes learning as having three components: the environment which facilitates learning (Learning Environment), the activities which are part of learning (Learning Processes) and the knowledge, behaviours, skills or understanding which can be demonstrated (Learning Outcomes) [14].

4 Accountable Demand and Obligated Study Behaviour – 'Assessment for Learning' Approach

Assessment is a process of gathering a variety of evidence to identify a student's performance of attainment of the intended learning outcomes, and the purpose of assessment is mainly to promote learning based on a philosophy of using 'assessment for learning' as a strategy to further transform and optimize the functionalities for

reconceptualizing a creative and specific learning environment for a good quality of education arises from the correct mix of enabling inputs and processes that allow a proper, relevant and educative interactions to produce desired learning outcomes. Watson and Angus described that "Assessment is the most powerful lever teachers have to influence the way students respond to courses and behave as learners. (Gibbs, 1999 p.41)", and also found the regular usage of online learning tools significantly and positively contribute to students' performance of learning and also act as a possible identifier for 'at-risk' students as well [15].

As insofar the confirmatory factor analysis revealed that there are so many variables could be empirically distinguished on the effects of perceived behavioural control and self-efficacy on behavioural intentions and actual behaviour differed in the e-learning practices. However, the quality of learning with the support of this technological educational tools in e-learning will not just depend on students' intention to adoption e-learning practices, but most importantly is the learning and study behaviours through this practices of e-learning can, in turn, produce or optimize the best results for educative and accountable learning for knowledge and intellectual skills development.

As learning aims for its quality, Biggs identified that students have intention processed the text for meaning and focus on themes and main ideas became the prototypes for the "deep" approach to learning; rather than just focused on words and sentences as the "surface" approach to learning [16]. In fact, there are many further steps for using the appropriate technological educational tools in a way to facilitate our educational practice and guide students' study behaviour of such quality approach of learning. He has also postulated that "the highest form of understanding, and the motivation driving it, creates a personal commitment to learn, with consequent feelings of 'ownership'. Such a commitment involves processes of a higher cognitive level than rote learning" [16].

This WE system is in a position to reconceptualize this kind of commitment of processes, to become more foremost 'Assessment Literate' through the embracement of an integrative conceptual frameworks for supporting the development of accountable educational practices, which blended with pedagogical criteria and together with an innovative technological educational tools, in creating this WE system to guide students' study behaviours towards the quality education of accountable learning. Nacheva-Skopalik and Green supported that such a system responds to the need of providing inclusive learning for a learners and is an important agenda item for higher education institutions [17].

5 Recommendations for the Need to Transform Educational Practices in More Accountable Learning -Mandatory or Optional

The main strategic considerations and implications for establishing an engaging learning environment which support for effective and accountable automated learning practices by using this proposed WE system, involve both intrinsic and extrinsic

factors of monitoring changes in Information and Communication Technology (ICT) strategy and its use in higher education, which in turn requires a significant change in pedagogy and a related shift in use technology platform of this proposed WE system for positively enhancing students' learning outcomes by enabling a Web-based environment to monitor and guide students' self-study and revision as an accountable study behaviours in learning.

In fact, accountability for learning can be seen as a personal virtue and this property of virtue will function as a positive quality in learning and intrinsic factor or determinant for self-motivated and accountable study behaviour. The existence of such personal virtue also serves as a synonym for a student or learner to self-initiated for taking 'responsibility', 'involvement' and 'participation' in their accountable learning, which is construed as the broader sense in the concept of 'accountability' with the presence of such genuine virtue. And therefore, one of the ways of unpacking the overall problems in recommending whether this WE system should be used mandatory or as supplementary for helping students to focus on an outcome-based learning for blending this strategic concept of using technological tools in educational practices as accountable study behaviour will be very much responding to the situation of the students' entry behaviour in this regard. Whereas a mandatory approach for students to make use of this proposed WE system on a compulsory basis could be the solution towards those students with a much narrower concept in exercising their sense of 'accountability'. And therefore, a mandatory approach can only be viewed as a forcible mechanism, another alternative to induce and shape the students for cultivating accountable study behaviour in learning as preconditions to this educational intervention.

Without compromising the expected learning quality, and for the avoidance of misnomer of the intended purposes of the four required aspects under our HK Government's Qualifications Framework in Education, this proposed WE system should be used mandatory as the integral part of homework under the philosophy of 'Assessment For Learning' strategy, in an attempt to optimize the beneficial effects of an accountable educational learning practices for the students' study behaviours.

6 Conclusion

Viewed separately or perhaps more importantly, is to rethink the fundamental processes of learning is not just a simple matter of using a technological educational tools, but more significantly is to support and facilitate students by cultivating their personal learning habits and accountable styles in practicing and managing their learning in accountable manner. What exactly these web-based technologies mean for blending learning and educational practices, in fact, have to be broadened by reconceptualizing a creative and specific learning environments' driving vehicle – that is students' accountable study behaviour in utilizing this inclusive e-learning tools integrating into the processes of learning as a blending educational practices.

The empirical review of those combinations of determinants of study behaviour that contributed to our overall understandings on the implications in formulating the

subsequent remediate educational and beneficial approaches for strengthening up areas of weakness for students to adopt this proposed WE system as part of accountable study behaviour for their automated learning. Interventional strategies for enabling and facilitating this outcome-based or outcome-focused learning can be considered as interactions between students' study behaviours and the professional obligations in support of this quality delivery from the role of academics and/or the affirmative initiations from the higher educational institutions as part of the quality assured mechanism through web-based learning technologies.

Despite the proliferation of web-based technologies in the educational sector have produced and projected wide-spread changes in our blended learning and educational practices for more than a decade, however the vast impact of these educational technologies on education need to be further strengthening up by references to the already reviewed studies and/or models that generated the pursuits of considerations with the in-depth understandings into the determinants of students' study behaviours from different perspectives of the reviewed conceptual frameworks, together with theoretical basis for determining how to have a proliferation of rule-based and principle-based system that embedded with factors arising from the studies and literatures such as TCM; DTPB; TPB; TAM; MUST model; Institutional Theory and LEPO frameworks that provided theoretical preconditions and justifications in enhancing students' ways of learning by optimizing and shaping a creative and specific learning environment to cultivate and reconceptualize accountable study behaviour as blending educational practices in learning.

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