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Conceptual Study on Enhancement of Education 4.0 from Management Perspective

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Abstract

Technology has enhanced learning in present days to be digitalized and simplified. In the present trends in education industry, there is a rapid development in the formation of the learning outcomes. This rapid development has becoming vital in the enhancement of the technology whereby the education industry is moving forwards towards education 4.0. To make the systems to be more interactive and attractive, MOOCS, LMS, BlackBoard and Moodle application used as a platform. Education 4.0 is striving to enhance the learning experience and create a sense of learning for assessment and independent learning behaviour in the students. This research study carried out to measure the effectiveness of education 4.0 among the undergraduate students and the methods used by the lecturer in delivering the course. Therefore, this study is to perceive the effectiveness of education 4.0 that focused on assessment for learning. From the administration perspective, this study analyse how the management can implement education 4.0 as the medium of delivering in higher education institutions. In order to carry out the research study, a balanced scorecard will be design to identify at which level the effectiveness and the management of the education 4.0 be reviewed. The population of the study are the management staff such as middle managers and top managers, staff and students randomly selected from public and private universities in Malaysia. Qualitative method used to conduct in depth interview towards the respondents using Nvivo. The expected results will provide valuable information for the management staff in managing education 4.0 strategically and develop value for the students in their charismatic career development.

Keywords: Balanced scorecard, digitalization, education 4.0, management strategy

Introduction

The world is moving forward towards the revolution of Industry 4.0. In uplifting the system towards competing with this revolution, many industries are moving forward in adapting to the new revolution. As of one, education system said being equipped adequately to adapt this culture in cultivating the cyber physical system. The education system in Malaysia is introducing many technological based open resources in teaching and learning management such as MOOCS, Moodle, Blackboard, Learning Management Systems (LMS), Multimedia Learning Management Systems (MLMS) and etc. The impact of this facility are enabling individuals to personalize their teaching and learning processes. As educators, it is said that the education in future is more challenge whereby it can de define by a German term “Gestaltung” we are shaping and forming a new education system for the leaners Blachfellner and Werner, 2016. The requirement of lifelong learning acts as an opening factor for the continuity of learning process. The learners will have to succeed to contribute in a working environment that is globalised, virtualized, networked and flexible. The job market changing the trends in designing jobs such as Blogger, Manager Social Media, App Designer and

Developer, Big Data Analyst and this jobs are not purely digital either hence the learners required to be sound knowledge in the field of application as such.

Objectives

RO1- To identify the methods can be used in teaching and learning process in higher education institution.

RO2 – To identify what are the contain of syllabus to be delivered using cyber-physical system.

RO3 – To identify the appropriate infrastructure used in teaching and learning process.

RO4 – To identify the role played by leaners and lecturers.

RO5 – To identify the attributes towards the management.

Research Questions

1. How will the lecturers teach the syllabus in Education 4.0 system?
2. How will the management design the syllabus structure content?
3. What type of infrastructure implemented by the management in the higher education institution?
4. What are the roles played by learners and lecturers?
5. What are the attributes benefits the institution from management perspective?

Literature Review

Education 4.0

Education 4.0 has set a different level of future for the present generation of pupils. Technology has change the system of production in human nature. Beginning with collaboration to productivity, working via virtual anywhere, developing new hiring skill are the trends in technology change developing in the new era. The trends can be also seen from the rapid change emphasizing in education since the development of as 1) Education 1.0 emphasizing of memorizing experience; 2) Starting with Internet education; 3) Knowledge consuming and producing era; 4) Innovation empowering education system. The present trend of changes among the current Gen of population is discuss in table below:

Table 1

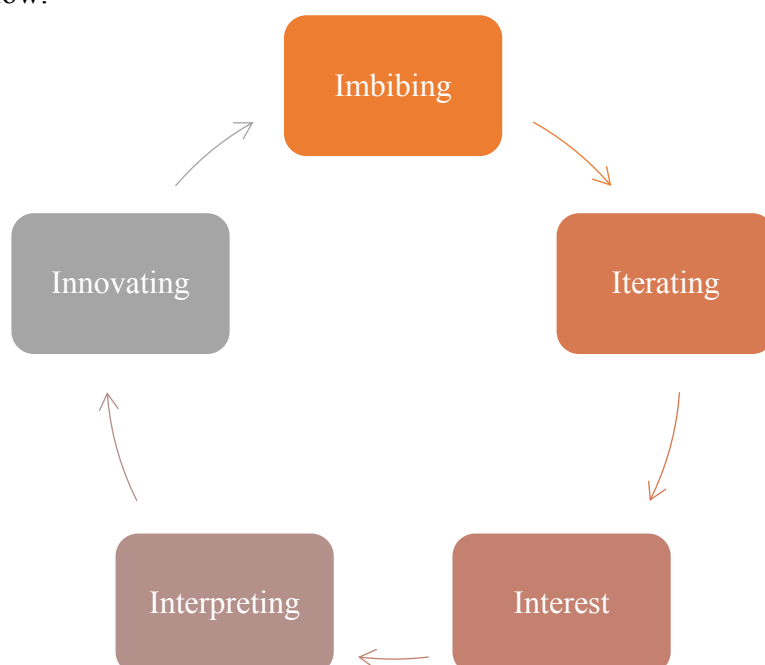
The trends of Gen Y and Z in present days

| Before | Now |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Few distraction (TV, Music) | The ubiquitous mobile phone has change the rules |
| Reading habit inevitably developed, at least to medium level | Video streaming , twitter , anything over a paragraph is daunting |
| Hands on parental involvement in learning | Drastically reduced, institutions inundated with more responsibility |
| Homogeneous educational experiences across institutions | Different model of teaching |
| Clearly drawn career path | Boundaries across discipline blurred |
| Limited, mostly reliable, formally published information | Information overloaded, often unverified, often deliberately inaccurate |
| Face to face interaction dominant | Virtual interaction dominant |
| Appreciation rare, mainly earned through significant effort and achievement | Appreciation ubiquitous, leading to skewed perception of self |

This dramatic change enhanced the future of education. “The future of education” is therefore a new vision for learning, starting right now is more important to know what are the learners required skill and knowledge. This customization learning process enabled tracking of performance of students using analytics. The advantages of education 4.0 can be describe as below:

- Anytime anywhere - Learners can have their own pace of learning environment and tool with interactive methodology.
- Personalized learning - Create high independency attitude among students and they will reinforced during the individual learning process.
- Project Based - As most of the employability adapting towards the hands on activity, learners are given more module on project and case study based learning. This helps in collaborative and time management skills among the students, which they can use in their further academic careers.
- Mentoring becomes significant - Leaners will be mentored with the facilitation of the instructor even though the education system is going to be virtual. Mentoring help leaners to change according to the system.
- Ownership of student - In this system, leaners are the owners of their subjects. They will be responsible for the entire process of the learning process.

These are exciting, provocative and potentially far-reaching challenges. For individuals and society, new educational tools and resources hold the promise of empowering individuals to develop a fuller array of competencies, skills and knowledge and of unleashing their creative potential. The 5 I’s developed based on the emphasize of the Education 4.0. The summary of 5 I’s are as below.



The figure above explains the importance of the 5 I’s that emphasized in the present education system. We are known that the present Gen of students are born with technology. In cultivate the system among the present Gen of groups, the adaption of this I’s becomes priority. Imbibe of knowledge and skill is required in present Gen of students since they become bored faster. They only can focus for couple of minutes and their attention will starts to move away slowly if we maintain the traditional methods of teaching process. Therefore the imbibe becomes important in the sense of whereby attraction is required in to sustain the present Gen

attention. Iterate is required to synthesized the learning process. More gamification is used to attract the learners. They learn when they have fun. Interpret enhance improving their critical thinking skills. As leaners just by teaching theories will not be strong, this system enable them to develop hands on subject that they can identify the solution by doing hands on activity. The attractive tools can increase the interest and desire of the leaners to adapt to the knowledge. By working in team will increase their preference to study. The last but not least, innovation will increase their confidence level in producing the project. Education 4.0 enable teachers to integrate the syllabus whereby the mind set of leaners will be more open towards the system. The education 4.0 increases leaners resistance in learning new term such as Big Data, Artificial Intelligence, cloud computing, cyber security and enhanced their skills towards more virtual learning adaptation.

Balanced Scorecard

Managing organization strategies at a time can be very challenging. In the midst of emerging process, the Balanced Scorecard was developed in response to this need (Kaplan & Norton 1992; 1996; 2001). Balanced scorecard introduced the idea of measuring the drivers of performance, while retaining the measures of financial performance (Brown, 2000). Balanced Scorecard is a strategy management system that helps managers to translate organization strategy into operational objectives and implement it. Balanced scorecard framework looks at the strategy from four different perspectives i.e. financial, customer, internal business processes, learning, and growth. Thus, it brings in the necessary clarity to strategy. Further, implementation of balanced scorecard ensures that strategy gets communicated to all the employees suitably to facilitate implementation by them. Measuring organizational performance through balanced scorecard reviews remain integral to balanced scorecard concept. Based on the learning from these reviews, strategy gets updated. Thus, the four important steps in balanced scorecard designing and implementation include 1) translating vision into operational objectives, 2) communicating the vision and linking it to the individual performance, 3) planning and adjusting the strategy based on feedback and 4) learning (Kaplan & Norton, 1996).

The measures on the balanced scorecard ensure a balance between external measures for shareholders and customers, and internal measures of critical business processes, innovation and learning and growth. It strikes a balance between the outcome measures of past performance (lag indicators); the measures that drive future performance (lead indicators), and also between clearly quantifiable and somewhat subjective measures (Kaplan and Norton, 1996). Balanced scorecard introduced the idea of measuring the drivers of performance, i.e. the lead indicators while retaining the measures of financial performance, i.e. the lag indicators of performance (Brown, 2000). Measures in each of these perspectives are interlinked such that a change in the leading measure results in a change in the lagging measure (Kaplan and Norton, 2001).

Balanced scorecard originated as a performance measurement, but quickly evolved into a widely accepted performance management and strategy implementation tool. The originators of the concept developed it with the private sector in mind. Accordingly, achievement of the financial objectives was the central objective of balanced scorecard. The balanced scorecard framework asserts that the financial objectives can be achieved by focusing on the drivers of performance in the other three perspectives. It also places value on the perspective of customers and other stakeholders. Thus, it looks at performance from different perspectives and across different objectives and stakeholders. These features of balanced scorecard have caught the interest of government and public sector enterprises which have to meet performance management aims and objectives (Aidemark, 2001; Bilkhu-Thompson, 2003; Modell, 2004).

Problem Statement

Higher education is the fastest growing service industry, which evolved drastically in the present years. The transformation has taken place slowly and now it has been drafted in the Malaysian Higher Education Blueprint (MHEB 2015-2025) for the digitalized and balanced education philosophies. As the revolution of Industry 4.0 is taking place drastically in industry and employability changes requirement, the education system is now adapting to manage and prepare the graduates to adapt to the industry requirement. Hence, many higher education institutions is working in developing new methods of platform in teaching and learning. Therefore, this study is carried out in order to see how Education 4.0 can meet the expectation of industry members. The other problem statement is how we are outfitting the appropriate methods of teaching and learning. The last problem statement is to study on the effectiveness of this platform in terms of quality in assessment as required by the government accreditation.

Methodology

Conceptual Framework

In this study a balanced score card were designed to evaluate the effectiveness of quality of digitalized education system in higher education institution. In management, a balanced scorecard used as a system to help managers to translate the organizations strategy into operational vision and implementing the strategy. The balanced scorecard evaluate the organizations performance in terms of growth, financial, customer and internal business processes. (Kaplan and Norton, 2008) used balanced scorecard helps the management to identify the customer's need and management growth by aligning the goals towards the strategy implementation. A conceptual framework designed to carry out the research study as follows:

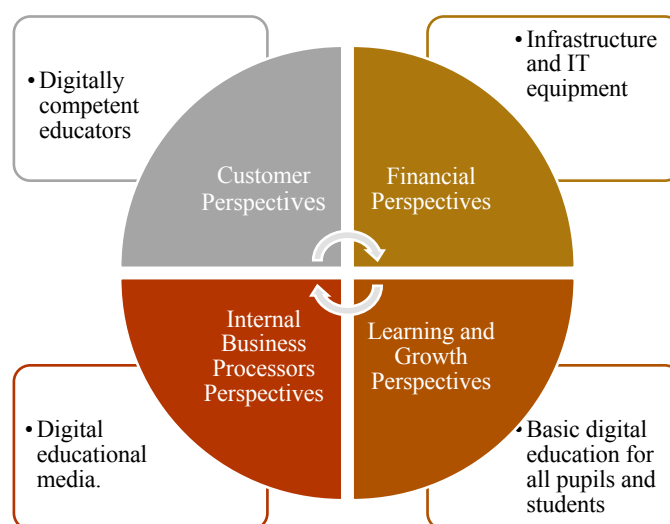


Figure 2: Conceptual Framework

Source: Adapted from Kaplan and Norton, 1996

The main purpose of this research is to develop a balanced scorecard that used to measure the implementation of the system and the perception of the students towards this self-centered digitalized learning. The aims of the measurement is to improve digital competences across all levels, and to increase the use of digital technologies for teaching and learning. The strategy rests on four pillars: basic digital education for all pupils and students, digitally competent educators, infrastructure and IT equipment and digital educational media.

This research study has a few significant benefits. First, the finding enables us to identify the perception of students and staff on using interactive tool in teaching and learning process.

Second, the study can reveals to the management to identify the infrastructure capacity required on integrating the facilities for the learning purpose. Third, the management and students can observe flexibility-learning environment among the students and staff preferences. The forth-important tool is how management can increase their ROI (Return on Investment) by implementing fully digitalized education system.

Data Collection Methods

The study is expected to be carried out at five (5) randomly selected Public and Private University in Malaysia. A qualitative and quantitative research are use in the research study. The qualitative study will measured by observing the delivered module to the respective students. There respondent are selected from different level starting from the first semester students, third and fourth semester and the final semester and the working adults' enrolled in the selected university whom are enrolled into online program. In this research, the target population are the student enrolled from various programs from Foundation studies, Diploma, Degree and Postgraduate studies. On the other hand, for quantitative measure, the target population is the students randomly selected from Public and Private Universities in Malaysia. The sample size taken is 1500 to achieve the aim of this study so that we can explore the perceptions and acceptance of the students on the usefulness and effectiveness of the E-learning adapted in their teaching and learning process.

Phenomenological study chosen as one of the qualitative method to achieve the objective of this study. A combination method such as conducting interviews, on focus group and reading documents is done to understand the meaning participants place on digital learning. It will be rely on the participants' own perspectives to provide insight into their motivations. In a phenomenological study, a few in-depth interview and focus group will be conducted on the focus groups of respondents which had mention above to build a sufficient dataset to look for emerging themes for e-learning and to use other participants to validate the findings.

As for the quantitative method, reliability analysis used to determine the extent to which the items in the questionnaire related to each other. Cronbach alpha is use in this study to estimate the proportion of variance that is systematic or consistent in a set of test scores. Descriptive analysis is use to summarize the quantitative data into a simpler summary to make it easier to understand and measure. It was use to describe the population in this study. Frequency distribution are used to show clearly how the data values such as demographic which include management level, age, income, education level, race and many more can affect the variables in this research. Distributions were also displayed by using percentage. Exploratory Factor Analysis (EFA) will be used to refine and validate the obtained data. In second stage, Structural Equation Method (SEM) will be utilized to validate each construct to find explore the students and instructor attitude and perception. SEM will provide a clearer conceptualization of the theory under study as it pictorially modelled the relationships among multiple variables. Nvivo will be used to analyzed the qualitative mix methods for the interviews and open-ended surveys collected from the respondent in this research.

Expected Results

The research enables learners to see the future of visionary digitalized education system in Malaysia whereby creates more talents and potential graduates whom prepared for future job in the country. The study also sketch out how higher ministry of education can design their curriculum structure in terms of teaching methods and assessment in this transformation. The study also enhanced how university 4.0 can collaborate with the industry and government to foster innovative ecosystem.

Conclusion

The revolution of industry 4.0 globally is believed to bring opportunities and challenges for the entire industry. This education system is built in by “experiential learning” and the teaching and learning outcomes are delivered across technology enabled platforms whereby in the collaboration with learning from the peers, social interaction and real world issues. With the current growing traction of online education globally, education 4.0 optimized learners to learn and apply the concept that they have learned. Learners are able to be independent, manage their time, learn the concept of people management, being creative and show their potential in critical thinking skills. Looking forward from the management view the implementation can optimize the enhancement of time and cost.

References

- Aidemark, L. 2001. The meaning of Balanced Scorecards in the health care organization, *Financial Accountability & Management*, 17(1), 23-40.
- Blachfellner, S., Werner, L. 2016. Bertalanffy Center for the Study of Systems Science. Socio-ecological Systems and Design, retrieved May 15 2016 from <http://www.bcass.org/research/fields-and-groups/socio-ecological-systems-and-design/>
- Kaplan, R. S. and Norton, D. P. 1996a. The balanced scorecard — translating strategy into action, Boston, MA: Harvard Business School Press.
- Kaplan, R. S. and Norton, D. P. 1996b. Linking the balanced scorecard to strategy, *California Management Review*, 39 (1), 53–79.
- Kaplan, R. S. and Norton, D. P. 2001b. The Strategy Focused Organization, Boston, MA: Harvard Business School Press.
- Modell, S. 2009. Bundling management control innovations; A field study of organizational experimenting with total quality management and the balanced scorecard, *Accounting, Auditing & Accountability Journal*, 22(1), 59-90.
- Modell, S. 2001. Performance measurement and institutional processes: a study of managerial responses to public sector reform, *Management Accounting Research*, 12(4), 437-464