Exploring 21st century skills among postgraduates in Malaysia

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Abstract

The twin forces of globalisation and internationalization have put a critical demand for resilient graduates who are able to compete at a global level. Henceforth, Institutions of Higher Learning (IHL) in Malaysia are constantly challenged to produce graduates with 21st century skills which will enable them to excel in today’s globalized, knowledge based society. This exploratory study aimed to investigate the 21st century skills among postgraduates from a public and a private university in Malaysia. The sample involved 59 postgraduate students and four lecturers and data were collected using a questionnaire and semi-structured interviews. Initial findings revealed that postgraduates articulated success in using ICT skills, collaborating, and lifelong learning in being leaders but lacked critical and creative thinking and communication skills. They also highlighted academic staff in tertiary institutions were a few steps behind them in terms of social media applications and they felt that IHL were not successful in developing their entrepreneurial skills. These findings have implications on postgraduate students’ readiness for careers and attempts to maximise 21st century skills among higher education students.

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Keywords: 21st century skills; postgraduates

1. Introduction

Globalisation and internationalization in the 21st century have placed exacting demands on the present society. The 21st century sees a global economy that emphasises information and knowledge economy which necessitates a

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more competitive, knowledgeable, creative and innovative workforce leading to increased investment in education, training, as well as research and development (Norasmah, Harinder, Poo & Norasiah, 2012; Norasmah, M. Izham, Harinder, Jamalul & Rahmah, 2011; Anantha, 2012; Sarjit, 2007). The implementation of the National Mission 2006-2020, the 10th Malaysian Plan and the National Higher Education Strategic Plan 2007-2020 are examples of policies taken by the Malaysian government to meet the need for 21st century human capital. Thus, there is an increase in the number of higher educational institutions and undergraduate students as well as emphasis on postgraduate students. To illustrate, in 2011, there were 94,008 postgraduate students in public and private HEIs in contrast to 75,199 in 2009 (Ministry of Higher Education, 2011, 2012a). Higher educational institutions are pushed to be “producers of new knowledge and disseminators of knowledge which forms human capital with the capacity to innovate” (Sarjit, 2007, p. 13) needed for the 21st century to contribute to the future competitiveness and success of a nation in the global marketplace. However, research among human resource personnel and senior executives highlight that attempts taken by HEIs to prepare for the economic future through quality student outcomes are insufficient and not fast enough (Hall, Swart & Duncan, 2012; Laurillard, Oliver, Wasson & Hoppe, 2009).

2. Employment of Graduates

There has been a tremendous increase from 231,800 graduates (undergraduates and postgraduates) in 1982 to 2.10 million in 2010 entering the labour market. However, there is concern as statistics in the labour force indicate an unemployment rate of 3.1% of graduates in 2010 (Department of Statistics, 2011). The Graduate Tracer Study Executive Report 2010 by the Ministry of Higher Education found that 24.6% of the 174, 464 graduates that took part in the survey were still jobless six months after graduation (MOHE, 2011). Specifically, with regard to postgraduates, the Graduate Tracer Study Executive Report 2011 indicated that 3.8% (27) of graduates with PhD and 11.6% (1,284) with masters are unemployed (Ministry of Higher Education, 2012a). The situation raises questions on the ability and competency of graduates and forces HEIs to examine their “products”.

The National Graduate Employability Blueprint 2012-2017 by the Ministry of Higher Education (2012b) reports on the problems that employers face in hiring fresh graduates. The dominant problems identified among them are poor ability in English (55.8%), negative character, attitude or personality (37.4%), unrealistic pay/benefits (33%), skills that do not match (30.2%), unable to solve problems (25.9%) and lack of depth of skill knowledge (23.8%). It is concluded that these graduates lack generic student attributes (GSA) which are in demand by the industry. Similarly, the preliminary report of Malaysia Education Blueprint 2013-2025 again depicts the concern of employers and industry leaders about inadequacies in problem solving and creative thinking skills and the English proficiency of graduates (Minister of Education, 2012). Chew (2013) also attests that graduates who are interviewed for jobs show inadequate core knowledge and competency, poor communication skills and language ability and insufficient general knowledge.

Noor Azina (2011) found that good English and soft skills for example, “analytical thinking, intelligence, independence, leadership, communication and computer skills and work experience” are factors that enhance employment prospects of graduates. Koo, Pang and Fadhil (2008) found that employers highly value attitudes and mindset which are positive. They are: learning beyond university, adapting to new situation, interpersonal skills, leadership, independence and determination to succeed. Employers also want competencies in content area, i.e. being a practitioner of knowledge and research skills and competency in communication such as skills in basic computing, managing information and communicating with non experts.

It is identified that the skills which employers in Malaysia want among graduates are hard skills and soft skills. The former refer to the “mastery and practice of a body of knowledge” such as research skills, computer skills, time management, etc. and the latter refer to inter and intra –personal skills such as team working skills, communication skills, decision making skills, etc. (Ministry of Higher Education, 2012b). In envisioning the crucial need for such skills, the Ministry of Higher Education in 2006 had introduced the development of soft /generic skills among students in HEIs. The skills focused on are skills in communication, problem solving and critical thinking, team working, lifelong learning and information management, entrepreneur, ethics and moral professional management and leadership (Ministry of Higher Education, 2006).
In addition, initiatives are taken continuously by the government to address the issue of unemployment. The Prime Minister of Malaysia, Y.A.B. Dato’ Sri Mohd Najib tabled Budget 2013 in the Parliament in September 2012. There was emphasis on skills and training and he mooted an allocation of RM200 million to set up a Graduate Employability Taskforce in line with the National Graduate Employability Blueprint launched at the end of 2012. This Blueprint aims to enhance the rate of employability of jobless graduates. In addition, the Skills Development Fund Corporation (PTPK) will be allocated RM440 million for the provision of loans for trainees to undergo skills training. The budget also sees the implementation of the 1 Malaysia Training Scheme Programme (SL1M) to provide soft skills training besides on-the-job-training in private companies to enhance the employability of graduates and companies which participate in it enjoy double deduction (from 1 June 2012 to 31 December 2016) on expenses which they incur (The 2013 Budget Speech).

The earlier attempts by the government to deal with graduates employment to an extent has paid off as seen from the findings of Norasmah et al. (2011) on the changes in Higher Education Institutions in Malaysia in view of globalization. Their findings show that HEIs have seen increasing demand and importance for higher education, internationalization, lifelong learning, information technology and generic skills. Likewise, Abd Rahman, Farley and Naidoo (2012) concluded from their research that public universities in Malaysia have attempted and improved consistently in meeting the government’s initiatives in its higher education strategic plan. Nevertheless, graduates employability still remains a looming issue all the more with the investment on postgraduate in HEIs.

The question which arises is how well equipped our graduates are with 21st century skills. In line with the emphasis on postgraduate level and the increasing number of postgraduate students, this paper aims to obtain a perspective of 21st century attributes of postgraduate students. This is significant for the success of postgraduates in “educational attainment and workforce outcomes” (Kyllonen, 2012).

3. Method

The main aim of the study was to investigate postgraduate tertiary students 21st century skills based on the following dimensions: critical and creative skills, ICT skills, entrepreneurial skills, lifelong autonomous skills, leadership skills, communication and English language skills. This study employed a descriptive research design with a mixed-methods approach. The study involved one public and one private university located in the Klang Valley. A total of 59 postgraduate students volunteered to participate in the study and they are referred to as Respondents 1-59. Semi structured interviews were conducted with six postgraduates (three from each university and were coded as Students A-F) and four lecturers (referred to as Lecturer A- Lecturer D) teaching at the postgraduate level in the two selected universities.

Data were collected using a questionnaire and semi structured interviews. The questionnaire referred to as the 21st Century Skills Inventory (21CSI) comprised three main sections and a total of 65 items with four open ended questions. The questionnaire was pilot tested at a public university in Malaysia and the overall alpha coefficient was .902. Descriptive statistical analysis was used to analyse the data collected. The semi structured interviews were analyzed deductively to address the concerns of this study.

4. Findings and Discussion

Investigation into the demographic variables indicated that out of the 59 postgraduate respondents, 83.1% were females while the remaining 10 (16.9%) were males. A large majority (78%) of postgraduates were between the ages of 25 and 30 years while 16.9% were between 31 and 40 years old. Out of the remaining three students, two (3.4%) were between the ages of 41 and 50 whilst one (1.7%) student was above 50 years old. All the students were from the discipline of Social Sciences and were currently pursuing their Masters degree.

The main aspect investigated in this study was students’ 21st century skills. The self-report 21CSI Questionnaire required students to rate their success in acquiring 21st century skills based on a 5-point Likert-scale of 1 (very low) to 5 (very high). The results are displayed in Table 1 below.
Table 1. Postgraduates’ Self-Perceived Acquisition of 21st Century skills (n=59)

<table>
<thead>
<tr>
<th>21st century skills</th>
<th>Mean</th>
<th>SD</th>
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</thead>
<tbody>
<tr>
<td>Working collaboratively</td>
<td>3.86</td>
<td>.757</td>
</tr>
<tr>
<td>Life-long autonomous skills</td>
<td>3.82</td>
<td>.761</td>
</tr>
<tr>
<td>ICT skills</td>
<td>3.70</td>
<td>.834</td>
</tr>
<tr>
<td>Leadership skills</td>
<td>3.69</td>
<td>.877</td>
</tr>
<tr>
<td>Critical and creative thinking skills</td>
<td>3.57</td>
<td>.735</td>
</tr>
<tr>
<td>Communication and English language skills</td>
<td>3.18</td>
<td>.934</td>
</tr>
<tr>
<td>Entrepreneurial skills</td>
<td>2.43</td>
<td>.832</td>
</tr>
</tbody>
</table>

Scale: 1= very low 2= low 3= average 4 high 5 very high

From the data presented in Table 1, it can be seen that postgraduates felt they were successful in working collaboratively (M=3.86, SD=.757) with others and possessed life-long autonomous skills (M=3.82, SD=.761) as most of them were working adults pursuing a postgraduate degree. They also possessed high ICT (M=3.70, SD= .834) and leadership skills (M=3.69, SD= .877). However, they were not too confident with regard to the acquisition of critical and creative thinking skills (M=3.57, SD=.735) and communication and use of English language skills (M = 3.18, SD = .934). They rated entrepreneurial skills (M=2.43, SD= .832) as the lowest.

4.1. Working collaboratively

Respondents indicated that they were able to interact well with all people ranging from the people at work and in society. Respondent R3 highlighted that Malaysia was a multi-racial country and hence, they were able to interact and mix well with people of other ethnicities and cultures. Data from the 12CSI Questionnaire also indicated the highest score under the category of working collaboratively was for students’ success in interacting and negotiating with people for common good (M = 3.92, SD = .816). This was followed by working together as a group or team (M = 3.88, SD = 1.019), seeking ways to clarify differences and resolve problems (M = 3.85, SD = .805) and willing to listen and respond constructively to diverse perspectives (M = 3.85, SD = .827). Meanwhile, the lowest rating was given to the item on “showing and explaining ideas and actions to a group of people” (M = 3.81, SD = .819).

Interview sessions with both students and lecturers corroborated with these findings. All four lecturers interviewed stressed that the postgraduates had no problems in working collaboratively for the common good. According to Lecturer A, the students were “able to conduct themselves in a professional and respectable manner”. Lecturer D, however felt that her postgraduate students were rather “ignorant” about a range of “western and global work culture and ethics” because a majority of her students were Malays and had little opportunity mixing with other races. She added that some of her younger students were also “rather close-minded to ideas and values that were out of the Malay culture”. Lecturer C felt that even though Malaysian students mixed well with other cultures, “a majority of these students are not able to leverage these social and cultural differences to create new ideas and enhance creativity”.

The good collaboration among participants in this study can be linked to their motivation and their shared histories and this may also explain their lack of collaboration with people and dealing with issues out of their norms. This is highlighted by Crook (2000) who believes that the affective factor, motivation has a strong relation to collaboration. Collaboration is motivating as there is “shared meaning” between participants, i.e. “both the sense of shared histories which learners build up in collaborative activities, and also that the shared history is unique to this particular group” (in Jones & Isroff, 2006, p. 194).

4.2. Life-long Autonomous Skills
Postgraduates in this study also articulated their confidence in possessing life-long autonomous skills, i.e. having the ability to plan, manage, organise, monitor and evaluate their own learning process. Data obtained from the 12CSI Questionnaire revealed students’ confidence in setting their own learning goals and objectives (M = 3.93, SD = .740) and ability to propose a plan of action or strategies to accomplish a learning task (M = 3.90, SD = .736). Confidence was also expressed in terms of managing their own learning process (M = 3.88, SD = .811) and planning their own learning process (M = 3.88, SD = 8.11). They, however expressed some concern with regard to evaluating the success of their own learning (M = 2.66, SD = .739) as this was also articulated by five out of the six students interviewed.

Lecturers in the interview sessions highlighted that postgraduate students were independent learners and were able to plan and manage their own learning. Lecturer C, however pointed out that “working adults displayed more independence, confidence and maturity of thought compared to young postgraduates students who embarked on a master’s degree immediately upon completing their basic degree”.

The findings on life-long autonomous skills are positive but it should be noted that the postgraduate students need a mechanism to evaluate their learning success. This can be achieved through feedback which is “timely and meaningful” to create among students self awareness and help them to self regulate their performance (Ellis & Goodyear, 2010, p. 109). Such attempt to improve lifelong learning skill benefit students’ ability to be flexible in the industry (Eleni, 2008 in Ramakrishnan & Norizan, 2012). This is because in a knowledge-based economy, lifelong learning is a necessity as “flexible knowledge and skills and ability to move easily from one job to another” is critical as a person can have as many as 10 to 14 careers in a “professional lifetime” (Casner-Lotto & Barington, 2006).

4.3. ICT Skills

There is no denying that the young today are very techno-savvy and this was quite well articulated by the respondents in the study. The students gave the highest score on their acquisition of skills and abilities to learn online social media (M = 4.18, SD = .799) and having knowledge about and regularly engaging in personal and professional learning opportunities online (M = 3.90, SD = .783). This was followed by developing proficiency and fluency with the tools of technology (M = 3.78, SD = .789), innovating technology for use in learning and at the place of work (M = 3.77, SD = .756) and ability to use software applications in learning tasks (M = 3.71, SD = .852). They gave the lowest rating to the item on regularly engaging in discussions about learning with technology with their teachers (M = 3.46, SD= .727). These findings showed that respondents were competent in using digital technologies but were rather hesitant in using technology for shared learning with their lecturers. The limited interaction with their lecturers via technology may be due to the norms and practices in their learning community in Higher Education. Lectures are the main instructional teaching method in Higher Education and students’ relations with lecturers are impersonal, i.e. lecturers deliver and students receive. Consequently, this division of labour in the learning community impedes students’ collaboration with their lecturers (Ellis & Goodyear, 2010).

Interviews with students also collaborated findings obtained from the questionnaires. All students expressed their confidence in using ICT to apply technology effectively. For example Student D pointed out that he was able to use “technology as a tool to do my research and communicate with my team members”. Student B highlighted that she was able to use “digital technologies like PDS, media players and GPS to enhance her classroom presentations and use social networks to access, integrate and create information” to function in today’s knowledge economy. Student E highlighted that “students are more knowledgeable than the lecturers in the use of ICT. . . and we feel lecturers should update themselves”. Student F felt “lecturers are two steps behind us students and sometimes we have to teach the lecturers about ICT”. Lecturers being a step behind the students were agreed upon by two lecturers. Nevertheless, Lecturer B and Lecturer D begged to differ. Lecturer D pointed out that even though students were more techno-savvy, “not all are able to manage information on the net accurately and creatively to solve issues and problems at hand”. Lecturer B added that “not all his techno-savvy students were successful in creating media products, i.e. understanding and utilising the appropriate media creation tools and conventions”. This indicates that HEIs have to be more assertive in changing lecturers’ and students’ conceptions and use of ICT in line with industry demands.
4.4. Leadership skills

On the whole, postgraduates felt they had good leadership skills (M=3.69, SD = .877) and were confident in guiding and leading others (M=3.97, SD = .879). They also highlighted that they were able to leverage the strength of others to accomplish a goal (M=3.76, SD= .762) and inspire others to do their best (M=3.59, SD= .832). The lowest rating was given to the item on demonstrating integrity and ethical behavior in using influence and power (M=3.24, SD = .743).

Interview sessions with students also corroborated the findings obtained from the 12 CSI Questionnaires. All six students expressed confidence in possessing leadership skills and Student F stressed that he “was already in leadership position” at his place of work. Student B felt that as a teacher she was already a leader as she had to lead her students to do their best. Lecturer D, however felt differently. She felt that her postgraduate students needed to take more leadership roles in the postgraduate classroom. She felt that her students still “waited passively at my feet . . . expecting me to tell them what to do . . . step-by-step”. She felt frustrated having to detail out most of the information. Lecturer B also felt that students should take a leadership role in their learning and “not expect everything from the lecturer”. He stressed that students must learn to be more responsible and act responsibly with interests of the larger community.

The gap between students and lecturers could be because students over rate their leadership skills. Besides, the gap seems to stem from differing views of leadership skills. Students’ views of leadership skills are generalized whereas lecturers want to see more of it in the immediate context of learning. Lecturers can address this by vocalizing their expectations of students’ responsibility for their own learning and creating conditions which aim to influence students to exercise leadership skills through design of tasks which emphasizes on the connectivity between activities and outcomes (Ellis and Goodyear, 2010).

4.5. Critical and Creative Thinking Skills

Findings from the 12CSI Questionnaire revealed that respondents possessed average (M=3.57, SD= .735) critical and creative thinking skills. The students also expressed highest ability in brainstorming technique, and creating new ideas (M = 3.69, SD = .793). This was followed by their ability in refining and evaluating ideas (M = 3.67, SD = .632), reasoning and making logical conclusions (M = 3.66, SD = .659) and interpreting, explaining and making predictions (M = 3.63, SD = .667). On the other hand, the lowest skill under critical and creative thinking skills was making inferences using inductive and deductive reasoning (M = 3.34, SD = .710). Students expressed rather low rating on the aspects highlighted in Table 2 below.

<table>
<thead>
<tr>
<th>Table 2. Postgraduates' Self-Perceived Acquisition of Critical and Creative Thinking skills (n=59)</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>tolerant of ambiguity</td>
</tr>
<tr>
<td>willing to take intellectual risks</td>
</tr>
<tr>
<td>intrinsically motivated</td>
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</tbody>
</table>

*Scale: 1 = very low 2 = low 3 = average 4 high 5 very high*

All four lecturers during the interview sessions revealed that critical and creative thinking was an aspect “seriously lacking” among students. Both Lecturer A and Lecturer D pointed out that their students lacked critical reading and writing skills. Lecturer A emphasized that her students were “not able to reason and analyze effectively, especially inductive and deductive reasoning”. Lecturer B added that his students were usually unable to “analyze how whole parts interact” and they had also “limited conceptual understanding of issues and concerns discussed in class”. Lecturer C stressed that her students were “not creative” and very few were able to think out of the box. Their ideas were often the run-off the mill and this often left “the lecturer contributing most of the ideas”. Lecturer D felt her students were not creative problem solvers and were “rather weak at making judgments and decisions”.

She also added that students were not able to make inferences and ask significant questions that could clarify points of view that could lead to better solutions. She highlighted that students lacked effective questioning techniques that could help them become critical and creative learners.

This situation among postgraduate students can be related to their socialization. Koo et al. (2008) believe that poor critical literacy among Malaysian students is due to teacher centered environment and exam oriented education. They assert that, “Students tend to be decoders in large part socialized by the dominant culture of transmissive-learning, sociopolitical structures of high collectivism and compliance and an intensely top-down examination system given to rewarding for formulaic responses to predictable examination questions which are high stakes for success” (p. 12). They caution that instructors in HEIs need to situate critical literacy learning in students’ contexts and experiences to promote queries and reconstructions of “naturalized or embedded textual assumptions” (p. 13).

4.6. Communication and English Language Skills

In this study, respondents did not express great confidence with regard to communication and English language skills, (M = 3.18, SD = .934). They, however expressed confidence in speaking confidently and effectively in English (M = 3.29, SD = 1.051). This was followed by evaluating and making judgments on materials read (M = 3.27, SD = 1.081), expressing their thoughts and ideas effectively using oral English (M = 3.27, SD = 1.096) and reading, comprehending and analysing English language materials read (M = 3.21, SD 1.136). The lower ratings were for writing in an organized, logical and persuasive manner (M = 2.18, SD = .915) and attending to ethical responsibilities required by these complex environments (M = 3.08, SD = .896).

Interview sessions also corroborated with these findings. All six students expressed confidence in speaking but admitted they lacked good and effective writing skills. Student D highlighted that she knew she was “weak in English and needed to improve my speaking, writing and grammar skills”. On the other hand, Student E articulated her limitation is “speaking confidently” and possessing poor pronunciation and articulation of thoughts and ideas. All four lecturers also admitted that their students had limited speaking and writing skills. Lecturer D highlighted that she found it “very frustrating working with some postgraduate students because of their limited writing skills especially their inability to link ideas and thoughts in a persuasive and coherent manner”. Lecturer A felt students had “very weak foundation in English and this can be seen in the poor grammar displayed in their writing”. Lecturer C further added that students’ limited language proficiency could be seen in the oral classroom presentation skills and written research reports. All four lecturers felt students fell short in their ability to demonstrate the use language effectively and efficiently.

Likewise, Koo et al. (2008) also found that poor English language proficiency is a problem among Malaysian graduates. In view of its importance due to globalization, they propose that English language should be viewed as “functional English for workplace environments” and its function as a lingua franca should be viewed “within the existing pluralistic repertoire of language codes, nativised and used by the majority of people whose mother tongue is not English” (p. 6).

4.7. Entrepreneurial Skills

Respondents in this study rated themselves lowest in entrepreneurial skills (M=2.43, SD= .832). A large majority felt they were not able to draw up a business plan for a new venture (M=1.25, SD .872), market and sell a new product or idea (M=2.13, SD= .751), and they admitted they lacked financial skills, such as book-keeping and calculating tax (M=1.57, SD=.751). These respondents also admitted to having limited knowledge in researching effectively on available markets, suppliers, customers and the competition (M=2.17, SD = .753) and were not willing to take risks (M=2.36, SD = .723).

Interviews with students further highlighted that all six of them had very limited knowledge and understanding of entrepreneurial skills. Only Student F admitted that he could see himself as an entrepreneur. Student F is an engineer and is currently pursuing masters in Educational Management and Leadership. He has ambitions of setting up a Tuition Centre and highlighted that university education did not prepare him with sufficient knowledge and skills to start a business on his own. Lecturer A stressed that if “our students are to become global players then we must have
a stronger focus on entrepreneurial education”. This was supported by Lecturer B who highlighted that current university courses “must move towards enhancing students” knowledge in entrepreneurial skills because a large majority of European businesses are SMEs”. The poor entrepreneurial skills of the students can be linked to their lack of familiarity of the business world and corporate cultures. Moreover, the education system, social and cultural norms in Malaysia tend to divide HEIs and the industry (Ramakrishnan & Yasin, 2012). The deficiency in this skill can affect employability and the effectiveness of job output. In view of this, there should be more emphasis in the inclusion of “real-life work experience” and industrial training/internship in HE courses.

5. Conclusion

The study has shown that postgraduate students perceive themselves to have good collaborative, lifelong autonomous, ICT and leadership skills, average critical and creative thinking, communication and English language skills and low entrepreneurial skills. However, with regard to the attributes which postgraduates perceive which they are good at, their lecturers would like them to be more attuned to other cultures, to improve ICT skills for problem solving, appropriation of media tools and collaborative learning as well as to be more assertive and lead. Simultaneously, more attention needs to be given to enhance critical and creative thinking, communication, English language and entrepreneurial skills among postgraduates. These findings highlight that despite the ongoing attempts taken by the government and HEIs to produce graduates with attributes for work success in the 21st century, there are still deficiencies even among postgraduate students.

There is urgency for HEIs to be more efficient and evaluate how they have attempted to provide students with the skills industry demands from graduates in the 21st century and to fulfil what the nation aims by 2020. They have been tasked by the industry with the responsibility to produce work-ready graduates (Casner-Lotto & Barrington, 2006; Ooi, Sarjit & Fauziah, 2012). Ellis’ and Goodyear’s (2010) concept on the ecology of a university to deal with change and to ensure sustainable innovation should be considered by HEIs. They propose ecological thinking to “identify structures and processes that are geared to dealing with change” by emphasising on the ecology of a university which comprises four main aspects which are inter-related. They are: learning as the point of ecological balance, ecological self awareness, feedback loops and self correction (pp.108, 109). Ecological balance refers to successful learning in a university. It denotes a similar learning objective among students, teachers, researchers, leaders and society which take into account the rapid changes at the global level and respond to them. Ecological self awareness helps HEIs to keep its balance, i.e. “participants in the ecology are aware of their place and functions in relation to the rest of the environment” (p. 108). Feedback loops ensure that there is awareness and self-monitoring among participants to deal with changes in the environment. Last, self correction refers to alignments that are necessary for ecological balance in a HEI. Future research can look at how successful HEIs are in preparing graduates for 21st century through this ecological stance.

References


