UNIVERSITI TEKNOLOGI MARA
Institute Of Continuing Education & Professional Studies

INTERNATIONAL JOURNAL ON E-LEARNING AND HIGHER EDUCATION

VOLUME 11
JUNE 2019
ISSN 1985-8620

INTERNATIONAL JOURNAL ON E-LEARNING AND HIGHER EDUCATION

INTERNATIONAL JOURNAL ON E-LEARNING AND HIGHER EDUCATION

Patterns of Student Engagement in Malaysian MOOCs

Harrinni Md Noor

Abstract :Massive Open Online Courses (MOOCs) have gained significant attention among academics and educational practitioners worldwide. Anyone with an Internet connection from any parts of the world can participate in a MOOC. In most cases, it is free and students have access to the teaching videos, course materials and able to participate in the learning tasks individually or as group work. Students can access to the online materials anytime and anywhere in the world. The number of students enrolled in MOOCs has also increased over the past few years. A survey undertaken by The Chronicle of Higher Education in February 2013 suggested that the average MOOC enrolment is 33,000 students (Kolowich, 2013). Stanford AI class, for example, had 160,000 students enrolled when it ran in autumn 2011 (Rodriguez, 2012). In Malaysia, MOOC on the Open Learning platform currently has about 120,824 students enrolled in over 265 courses. Though the number seems to be small as compared to courses in other parts of the world, it is expected to increase in the near future. The Higher Education Ministry at the Ministry of Education Malaysia, has introduced Malaysian Higher Education Plan (2015-2015) that looks into the demands of the 21st century education. MOOC supports the 9th Shift of the Higher Education Blueprint that is Global Online Learning. There are many MOOC platforms but the needs and concern on the teaching and learning through MOOCs remains similar - as to how we might satisfy students' online education needs that they will make them stay engaged to MOOC. In this research, student engagement refers to the degree of attention and interest that students show through their responses, when they are learning, which extends to the level of motivation they have to learn and progress in the enrolled MOOC.

INTRODUCTION

Several studies of particular courses have found out that those who enroll in MOOC have a wide variety of motivations for doing so (Breslow et al., 2013; Koller, Ng, Do, & Chen, 2013). In order for students to complete the course require a certain amount of self-motivation (Hone and El Said, 2016; Liyanagunawardena, Adams, & Williams, 2013). However, motivation does not predict whether a student will complete a course (Breslow et al., 2013). If we manage to engage the students well enough, they might want to complete the course at their own pace. Student engagement will predict their retention in the course. The study also suggested that promoting student motivation and monitoring individual students' online activities might improve course retention. Therefore, this study seeks to explore some learning patterns that might suggest a number of factors that may influence student retention to MOOC.

LITERATURE REVIEW

Most research on instructor student interaction conducted has been looking at the face-to-face settings. A few research studied the impact of this interaction in online environments like the social media, but not MOOC. Therefore, there is a need to better understand how communication between instructor and students can enhanced student engagement in MOOC. According to (Dixson, 2010) the path to student engagement is not about the type of activity/assignment but about multiple ways of creating meaningful communication between students and with their instructor. Students in online environments have the opportunity to spend more time interacting with other students and the instructor than they do in face-to-face environment. Social presence of both other students and the instructor is important.

Similarly, student expectations in online environment are likely to be different than in face-to-face environments. The online and offline engagement highlights the need for research on engagement in MOOC. This paper addresses the pattern in student's engagement to improve our understanding of what could be effective elements in MOOC that are used to engage students.

Most of the time, students were encouraged to take a MOOC of their own choice as part of their development. However, studies suggested that only a small proportion of MOOC participants go on to complete their courses. Self-paced learning, which is often the case in MOOC, relies on the determination of the students to go through the online learning materials and complete the course on their own. Many do not succeed in completing the course. Relatively little is known about the factors that influence their retention. Dixson (2010) found that instructor and student interaction in MOOC was a significant predictor of MOOC retention. Therefore, this paper aims on exploring the patterns of student engagement in Malaysian MOOCs to propose other elements that could contribute to student retention and increase the completion rate of MOOC.

METHOD

A national level MOOC content development competition was carried out in Malaysia recently. The National e-Content Development Competition (eCONDEV 2017) was held in Universiti Teknologi MARA (UiTM) on 15 August, 2017. This competition showcased more than 200 MOOCs in Malaysia. Only the list of active MOOCs showcased and maintained at Open Learning was used as a starting point for this study. This criteria was used because (i) Open Learning is the official MOOC platform endorsed by the Ministry of Education, Malaysia which have fuelled the local interest in MOOCs, (ii) the platforms account for the majority of Malaysian MOOCs to date, and (iii) the platform reflects the higher education sector more broadly, offering courses presented from the majority of higher learning institution in Malaysia. Other individual MOOCs and platforms were excluded in this study.

Out of the total number of competitors in the competition, only 178 MOOCs were shortlisted as they are visible online. The rests of the MOOC were excluded because they were still offline and have not been offered to public. The links to the MOOCs were also not available at the time of this study. Out of the total number of the visible MOOCs selected, only 164 MOOCs were considered active. In this study active MOOCs refers to MOOC that are made available online and has been offered to the public with a substantial number of student enrolment and student-instructor interaction.

Enrolment, student-instructor responses, number of students with progress, median of completion, and the uniqueness of the instructor reply, were selected as the data to be collected from the MOOCs to visualize the pattern of student's engagement as these are the metrics which are most commonly available. Completion rate in this case refers to the percentages of students who had satisfied the courses' criteria in order to gain a certificate of completion. Data was also gathered about the number of 'active users' in courses. Active users in this research refer to students who actively engaged with the course material to some extent (as opposed to those who enrolled but did not use the course at all). For example, this includes having logged in to a course, attempted a quiz, or viewed at least one video.

It should be emphasized that this study sought to be exploratory in nature, identifying patterns of interest from the data as a starting point for further research but not seeking to explain or model the phenomenon. Reliability of the approach is less contentious as the data were provided by Open Learning, which, in this case, is the provider for the MOOC platform.

Data Analysis

Total Enrolment Figures

Total enrolment numbers comprises a total of 164 courses. The figures range from 1 to 6611 students. Figure 1 shows a total of 164 courses with the majority of enrolment below 500. 153 courses have an enrolment of below than 500 students. Only one course reached more than 6500 student enrolment (with 6611 students to be exact). One more course has 5210 students while one course has 2117 students. Two courses were within the range of 1501 to 2000 students, three courses within 1001 to 1500 students and three courses within the 501 to 1000 range.

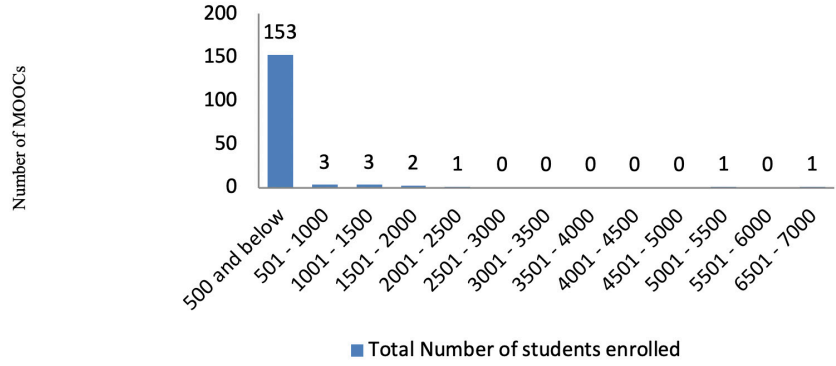

Figure 1. Total Enrolment number for the sampled MOOCs

Students with Progress

Figure 2 shows the percentage of students with progress based on the 164 MOOCs analyzed. 59% of the MOOCs (97 courses) has 0% progress. This means that students just enroll in the course but did not show any progress at all. Progress refers to the number of activities that the students participate (out of the total activities for each course) that contributed towards getting a certificate of completion for the course. 9% of the MOOCs (15 courses) has only 1% to 10 % progress. 13 (7.9%) MOOCs are within 11% to 20% progress. Only 2 MOOCs have a high percentage of student progress, which is above 91%.

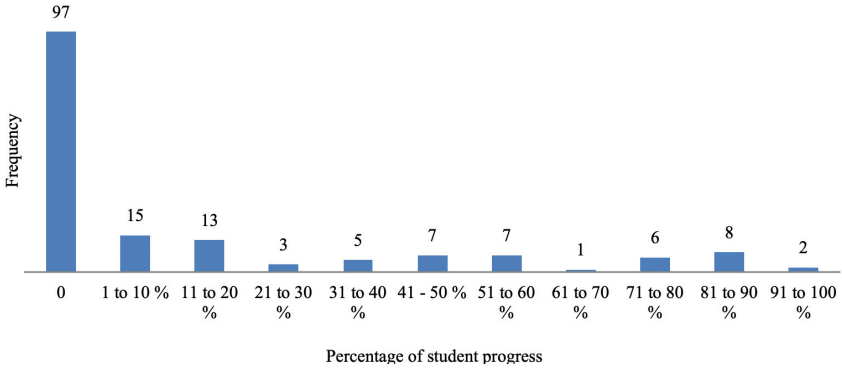

Figure 2. Percentage of students with progress

Students Completion Rates

Completion rates were calculated as the percentage of students with progress (out of the total enrolment for each course) who satisfied the criteria to gain a certificate for the course. This information was available only for 120 courses in the sample. Median of completion and student with progress is shown in Table 1. The data was obtained from Open Learning.

Table 1: The number of Student Enrolment, Student with Progress and Median of Completion

Student Enrolment	Student with progress	Median of Completion
86	71	100
123	89	86.67
37	30	85.48
1649	1228	80
28	15	69.23
1613	1379	68.57
27	15	60.61
25	12	50
10	9	47.62
209	117	46.81
78	62	45.83
3	1	44
26	21	43.75
51	44	41.18
4	2	39.47
229	25	37.5
20	6	33.33
271	112	29.9
56	51	27.78
6	4	26.09
92	71	25
167	68	24.24
2	1	22.5

6	2	21.43
10	6	20.59
392	30	20
19	6	20
10	5	20
1	1	20
12	3	19.67
100	74	18.52
3	1	18.42
24	10	18.18
5	3	18.18
1097	496	17.65
88	14	15.89
12	3	14.71
37	2	14.13
6	5	13.33
6	3	13.11
1469	49	13.04
101	91	13.04
114	23	12.5
56	34	12.5
3	1	12.5
56	10	12.06
180	7	11.76
129	56	11.76
6	2	11.76
13	2	11.54
7	5	11.11
4	1	11.11
56	18	10.59
9	2	10.53
7	4	10
79	42	9.84

36	4	9.26
2117	729	9.09
34	3	9.09
3	1	9.09
83	6	8.82
197	103	8.57
3	2	8.57
7	1	8.51
8	5	8.47
11	1	8.33
8	6	8.33
5	3	8.33
27	4	7.89
9	1	7.69
7	2	7.69
6	3	7.69
43	35	7.5
567	52	7.41
211	137	7.14
1	1	7.14
43	8	6.54
12	2	6.25
7	3	5.97
1	1	5.88
22	3	5.56
42	36	5.5
10	2	5.41
644	50	5
23	4	5
7	1	5
7	1	5
29	27	4.92
6	2	4.84

53	8	4.81
50	10	4.81
5	3	4.76
586	235	4.55
66	60	4.4
5	1	4.35
5210	6	4.29
7	3	4.26
5	3	4.17
55	14	4
10	1	4
419	3	3.85
42	22	3.85
3	1	3.33
39	13	3.23
12	2	3.23
332	77	3.17
108	3	3.13
244	19	3.08
4	2	2.78
12	7	2.47
6611	14	2.44
98	16	2.27
83	34	2.22
50	7	2.22
1113	555	1.9
164	19	1.89
35	3	1.69
4	1	1.64
1	1	1.39
4	1	1.03

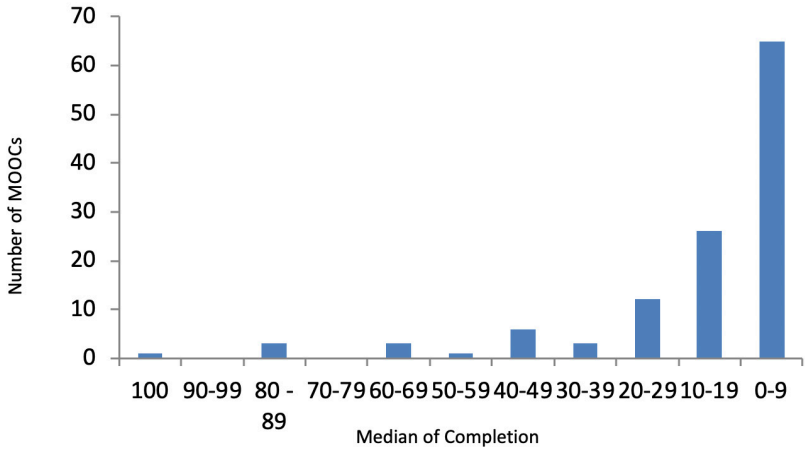

Figure 3. Students Completion Rate

The majority of the courses (n=65, 54%) have median completion of less than 10. 26 MOOCs have median completion of less than 20%. 12 MOOCs have median completion of less than 30. Only 1 MOOC has a median completion of 100.

Student Engagement

The most common definitions of engagement across the duration of courses used by the sources were the number of students accessing resources, or completing assignments. Only 49 courses showed some activities in student engagement (Table 4). The engagement level ranges from 0.0092 to 1.3382. This data was provided by Open Learning, based on (i) the number of comments over the number of students, that reflect instructor and student replies, (ii) the number of replies from the students and instructors over the total number of comments, (iii) the percentage of unique comments by authors based on the number of students, and, (iv) the percentage of students with progress over the number of students' enrolment.

Table 2: The number of Student Engagement and other related data

Course	Students Enrolment	Comments	Instructor Replies	Student Replies	Students with Progress	Median Completion	Unique Comment Authors	Engagement
1	1649	7543	138	3303	1228	80	1420	1.3382
2	26	226	0	38	21	43.75	21	0.9535
3	79	797	35	208	42	9.84	46	0.9522
4	123	1671	18	164	89	86.67	88	0.7660
5	92	353	63	43	71	25	74	0.7152
6	43	178	10	30	35	7.5	37	0.6515
7	83	387	23	133	34	2.22	52	0.4824
8	271	4227	105	517	112	29.9	125	0.4375
9	211	1148	18	245	137	7.14	108	0.4142
10	209	1459	0	219	117	46.81	117	0.3284
11	100	301	10	47	74	18.52	65	0.2742
12	28	149	0	15	15	69.23	17	0.1742
13	56	348	29	37	18	10.59	21	0.1421
14	27	173	0	11	15	60.61	15	0.1257
15	1613	17542	34	232	1379	68.57	1247	0.1090
16	78	552	1	12	62	45.83	58	0.0985
17	56	181	23	30	10	12.06	31	0.0936
18	51	127	1	6	44	41.18	28	0.0650
19	66	193	2	3	60	4.4	57	0.0595
20	644	1783	782	406	50	5	262	0.0583
21	129	460	1	19	56	11.76	103	0.0537
22	37	530	0	2	30	85.48	27	0.0320
23	56	44	1	3	34	12.5	20	0.0155
24	42	39	0	4	22	3.85	11	0.0131
25	392	459	10	77	30	20	259	0.0112
26	1097	816	1	115	496	17.65	211	0.0092
27	244	184	5	54	19	3.08	62	0.0048

28	29	17	0	1	27	4.92	4	0.0044
29	1113	535	1	32	555	1.9	259	0.0034
30	586	238	27	26	235	4.55	47	0.0029
31	56	161	0	1	51	27.78	10	0.0029
32	24	5	0	1	10	18.18	4	0.0029
33	25	8	1	0	12	50	3	0.0023
34	39	7	2	1	13	3.23	3	0.0020
35	101	86	1	0	91	13.04	21	0.0019
36	164	64	7	14	19	1.89	20	0.0018
37	35	15	0	2	3	1.69	12	0.0017
38	2117	2806	5	37	729	9.09	369	0.0012
39	567	274	6	12	52	7.41	228	0.0012
40	37	26	3	0	2	14.13	6	0.0007
41	332	50	1	15	77	3.17	19	0.0006
42	22	5	0	1	3	5.56	2	0.0006
43	50	22	0	1	10	4.81	7	0.0006
44	167	12	1	4	68	24.24	5	0.0004
45	50	5	0	1	7	2.22	4	0.0002
46	98	13	0	1	16	2.27	9	0.0002
47	197	14	0	1	103	8.57	8	0.0001
48	108	21	2	4	3	3.13	7	0.0001
49	83	77	0	1	6	8.82	8	0.0001

FINDINGS AND DISCUSSION

The findings here showed that the majority of courses (54%) have been found to have completion rates of less than 10. The completion rate refers to the percentage of enrolled students who satisfied the courses' criteria in order to earn the certificate of completion. Majority of students (59%) just enrolled in the course but did not show any progress at all and those who showed progress may not also have high engagement level. Based on the findings, it can be concluded that high engagement level is not determined

by the number of replies both students and instructors make but is actually reflected through the percentage of unique comments by authors and also the student progress. The pattern showed that students who were highly engaged in MOOC had shown effort to complete the activities, made comments and attempted to complete the course tasks. In many cases of the Malaysian MOOCs in this study, having a high student enrolment does not promise a high completion rate. While completion rates as a percentage of active students span a wider range than completion rates as a percentage of total enrolments, there is a strong skew towards lower values. The differences here would be worthwhile to explore in further detail to explore features of course design that may account for the wider variation observed.

The findings could also suggest that there are potentially many ways in which MOOC students may participate in and benefit from courses without completing the assessments. The low completion rates observed when defining completion as a percentage of active learners in courses is interesting and warrants further work to better understand the reasons why those who become engaged initially do or do not complete courses. This is not to say, however, that completion rates should be ignored entirely.

CONCLUSIONS

This paper explores some patterns of students engagement in Malaysian MOOCs. This study has only considered some data between enrolment and completion. Information about enrolment numbers and completion rates were gathered from Open Learning. 164 Malaysian MOOCs were analysed in terms of enrolment, student-teacher responses, number of students with progress, median of completion, and the uniqueness of the instructor's reply, to visualize the pattern of student's engagement. The findings from this study is hoped to contribute to the understanding of student's engagement which could later perhaps mapped out their performance in MOOC.

Looking at completion rates is a starting point for better understanding the reasons behind them, and how courses could be improved for both students and course leaders. For example, the relationship between enrolments, completion, and course length is an interesting issue for MOOC course design, balancing the higher enrolments with the lower completion rates

of longer courses. Figures about how many students achieved certificates obscure how many students attempted to gain a certificate but did not meet the criteria. Given that MOOCs are offered free of educational prerequisites, striving to improve teaching on courses so that students who wish to complete are assisted in doing so is an important pedagogical issue.

A limitation of the approach used here is that the data neglects the student voice. While these approaches can identify brief patterns, they are unable to explore in detail the reasons behind the patterns observed. An area to consider in future could be the impact of different assessment types, linked to the criteria for achieving a certificate of completion. MOOCs should be considered as a new type of virtual organization that is composed by educational contents, technology and learners, rather than a simple combination of learning materials and platforms. Building a deep understanding of user needs is crucial for future evolution of MOOCs.

REFERENCES

Adamson, D., Rose, C.P., Sinha, T., & Yang, D. (2013). *Turn on, Tune in, Drop out: Anticipating student dropouts in Massive Open Online Courses*. Proceedings of the 2013 NIPS Data-driven education workshop 11, 14

Dixson, M. D. (2010). *Creating effective student engagement in online courses: What do students find engaging?* Journal of the Scholarship of Teaching and Learning, Vol. 10, No. 2, June 2010, pp. 1 – 13.

Hone, K. S. and El Said, G.R. (2016) *Exploring the factors affecting MOOC retention: A survey study.* Computers & Education. Vol. 98 (2016) p 157-168

Kolowich, S. (2013). *The Minds Behind the MOOCs*. The Cronicles of Higher Education.
Retrieved: http://www.chronicle.com/article/The-Professors-Behind-the-MOOC/137905

Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013).

MOOCs: a systematic study of the published literature 2008e2012. The International Review of Research in Open and Distance Learning, 14(3), 202 - 227.

Onah, Daniel F. O., Sinclair, Jane and Boyatt, Russell (2014) Dropout rates of massive open online courses : behavioural patterns. In EDULEARN14 Proceedings, 6th International Conference on Education and New Learning Technologies, Barcelona, Spain, 7-9 Jul 2014. Published in: pp. 5825-5834.

Ramesh, A., Goldwasser, D., Huang, B., Daumé III, H., & Getoor, L. (2013). Modeling learner engagement in MOOCs using probabilistic soft logic. In *NIPS Workshop on Data Driven Education* (Vol. 21, p. 62).

Rodriguez, C.O. (2012). MOOCs and the AI-Stanford like Courses: Two Successful and Distinct Course Formats for Massive Open Online Courses. *European Journal of Open, Distance and E-Learning*, 2012

Zheng, S., Rosson, M.B., Shih, P.C. and Carroll, J.M. (2015). Understanding Student Motivation, Behaviors, and Perceptions in MOOCs. Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing.

The Application Of Arcs Motivational Model In Massive Open Online Course (MOOC)

Erny Arniza Ahmad

Abstract : Massive Online Open Course (MOOC) is an emerging practice in open learning. It also becomes an alternative way of delivering interactive teaching and learning. Malaysian Education Blueprint for Higher Education (2015-2025) has discussed MOOC under the 9th Shift called "Globalized Online Learning". In this Shift, Ministry of Education declares Malaysia's aims to leverage on MOOC as a way to take advantage of technology to improve quality and widen access to education (Ministry of Education, 2015).

INTRODUCTION

In developing countries, the use of MOOCs is an alternative educational offering for professionals who look for complementary training and education. In addition, these courses allow the acquisition of new knowledge and skills in fields that could provide them the opportunity for a better income or to continue learning throughout life. MOOCs have received wide publicity and many institutions have invested considerable effort in developing, promoting and delivering such courses. However, there are still many unresolved questions relating to MOOCs and their effectiveness. One of the major recurring issues raised in both academic literature and the popular press is the consistently high dropout rate of MOOC learners. Jordan (2015) had assembled a MOOC completion rates visualisation. There were 230,000 enrolments generated on average from 218 investigated MOOCs, and approximately 15% as its average completion rate. One of the identified reasons behind the scenario is due to low motivation (Ejreaw & Drus, 2017).

It is generally true that self-study requires commitment and self-discipline. In most MOOC cases, learners may not be motivated enough to keep up with their online content (Ejreaw & Drus, 2017). Nevertheless, continuing with the course for weeks or even months is more complicated and time-

consuming. As a result, designing materials and activities to keep learners engaged and persisting in the courses that they have signed up for is a problem for practitioners working with MOOCs.

Keller's ARCS Motivational Model (1987) focuses on creating, stimulating, and maintaining motivational environments has been researched and adopted in various learning settings (Malik, 2014; Hodges & Kim, 2013; Lee & Kim, 2012; Bae et al., 2005). This model consists of four main components for motivating learning. The categories are Attention, Relevance, Confidence, and Satisfaction. In this model, it emphasizes that, first, the course design should incorporate a variety of strategies to gain learners' attention, interest, and stimulate curiosity in the inquiry. Second, it helps establish relevance by help setting clear goals, relates the learning material to learners' past experience and future requirements. Third, it helps learners build up confidence in learning. Fourth, it helps learners establish a sense of satisfaction and accomplishment (Huang & Hew, 2017). This systematic design model has been used as a guideline in numerous studies (Kurt & Kecik, 2017; Marshall & Wilson, 2013; Chanlin, 2009).

Within the MOOC learning context, the use of motivational elements are not limited to the design of instruction, but also the ongoing use of communication tools and electronic resources provided along the process of learning and interaction (Chanlin, 2009). This paper describes the application of Keller's ARCS Motivational Model to the development of Management Information System (MIS) Massive Open Online Course (MOOC). It highlights the elements of the developed modules as best practices and describes the alignment of each to the ARCS Motivational Model components.

MOOC IN MALAYSIAN HIGHER EDUCATION INSTITUTION

The Ministry of Education Malaysia (MOE) produced the Malaysia Education Blueprint 2015-2025 (Higher Education). One of the aspirations is to globalize Malaysian higher education institutions, and MOE has introduced MOOCs to be integrated into the higher educational system. Among the reasons behind the implementation of MOOC is the ability to

access learning content, materials, and tasks with minimal or no fees as well as the ability to gain credits upon successful completion of a MOOC (Ministry of Education, 2015).

In line with the advancement, Ministry of Education Malaysia has initiated Malaysia MOOCs in collaboration with four public universities as MOOC content developers. The universities are (i) Universiti Kebangsaan Malaysia (UKM), (ii) Universiti Putra Malaysia (UPM), (iii) Universiti Teknologi MARA (UiTM), and (iv) Universiti Malaysia Sarawak (UNIMAS). The courses are compulsory courses for undergraduate students. The courses are (i) Ethnic Relation course (UKM), (ii) Asia and Islamic Civilization course (UPM), (iii) Introduction to Entrepreneurship course (UiTM), and (iv) ICT Competency course (UNIMAS). OpenLearning (https://www.openearning.com) was the learning platform chosen for the implementation of the Malaysia MOOC.

To date, Malaysia MOOCs is offering 63 exciting courses, and there are 137, 946 learners from over 80 countries who have enrolled for the courses (https://www.mohe.gov.my/en/student/initiative/mooc).

LITERATURE REVIEW

Motivation in Online Learning

Motivation has been defined as "that which accounts for the arousal, direction, and sustenance of behavior, and can be used to explain why people choose to do certain things and how much effort they put into doing them" (Keller, 2010; Keller, 1979). People with motivation toward certain things will be active in doing these things while those who are not motivated will act passively in performing tasks (Ryan & Deci, 2000). Motivation is such a complex issue in that it is dynamic and there are no widely accepted rules to predict it (Keller, 2010). Different people have motivation toward different things. Even for the same person toward the same thing, motivation is not constant in different situations or at different times (Hartnett et al., 2011).

Due to the uniqueness of online learning, learners' motivation becomes

a well-investigated issue in the online learning environment. In a literature review, Bekele (2010) found that most studies being reviewed have reported online learning environment is itself a motivator to learners and also supports learners' satisfaction. Moore and Kearsley (2011) considered learners' motivation as a very important factor that was related to learners' success in distance education. A study conducted by Clayton et al. (2010) revealed that students who preferred different educational environments – traditional courses and online courses had different motivational components. Students who chose traditional courses believed that the format suited their learning style better and thus they were willing to spend more time and put more effort into learning. For students who preferred online format, they were more confident that they could deal with the online learning.

Several indicators, according to research studies, affect students' motivation. The literature review on online learning describes that external as well as internal factors affect learners' motivation in the online learning environment (Bekele, 2010). External factors include the technologies in the course, the quality of the course design, student support service, and etc. Different strategies have to be used to judge and to promote learners' motivation in online learning environments, which is different from face-to-face instruction, in which teachers can observe students' reactions to judge their motivation or provide immediate verbal feedback or emotional support to those who with low motivation (Li, 2015)

Completion and dropout rates have been examined widely in the literature of online learning environment, and motivation and its constructs are always identified as important factors to influencing online retention rate. Song (2000) stated that "when learners do not have proper motivation to persist, they will drop the course or they will procrastinate". Emotional support from faculty and friends and learners' self-efficacy were important factors for students who persisted in online learning (Park & Choi, 2009). A literature review conducted by Hart (2012) revealed that learners' motivation was one of the most important components that made them persist in online learning environments. Merely admitting the importance of motivation in online learning environments or examining learners' characteristics that make them successful in online courses is not enough. Researchers and practitioners have explored methods to increase learners' motivation in instructional design.

The ARCS Motivational Model

Keller (1979) developed the ARCS Motivation Model to make the instruction more interesting and to enhance learners' motivation. This is the first model that incorporates motivation into a systematic instructional design process. There are four main categories in the ARCS Motivation Model which are Attention, Relevance, Confidence, and Satisfaction. If the subject matters can catch students' attention and is connected to learners' prior knowledge or current experience, they would be satisfied in the learning process, feeling secured and confident in mastering the subject matters.

Hence, it is necessary to take the four categories into consideration during designing the learning content in order to create an optimal learning environment in which learners would feel comfortable and motivated to learn. These four categories represent sets of conditions that are necessary for a person to be fully motivated, and each of these four categories has component parts, or subcategories. The challenge of how to stimulate learners' motivation to learn can be made more predictable and manageable by considering the four general ARCS requirements. There are practical strategies have been introduced by Keller (1987) to be used in achieving each of the requirements as shown in Figure 1.0.

The first strategy in motivating learners is to gain their attention. There are different tactics, which range from simple unexpected events to mentally stimulating problems that engage a deeper level of curiosity. Another element is variation, which is necessary to sustain attention. Content needs to be delivered using different delivery techniques and strategies. The second requirement is to build relevance. Even if curiosity is aroused, motivation is lost if the content has no perceived value to the learner. Relevance results from connecting the content of instruction to important goals of the learners, their past interests, and their learning styles. One traditional way to do this is to relate content to the learners' future job or academic requirements. Another, and often more effective approach is to use simulations, analogies, case studies, and examples related to the students' immediate and current interests and experiences. The third condition required for motivation is confidence. This is accomplished by helping learners establish positive expectancies for success. Often students have low confidence because they have very little understanding of what is

expected of them. By making the objectives clear and providing examples of acceptable achievements, it is easier to build confidence. Another aspect of confidence is the encouragement. Learners should believe that they can achieve any task and be encouraged to attribute their success of failures to personal effort. To further sustain learners' motivation, the fourth condition of motivation must be fulfilled that is satisfaction. Satisfaction means learners should have positive feelings about their accomplishments and learning experiences. It means that they need to receive recognition and evidence of success that support their intrinsic feelings of satisfaction and they believe they have been treated fairly. Tangible extrinsic rewards and opportunities to apply newly learned skills support intrinsic feelings of satisfaction. Finally, a sense of equity, or fairness, is another necessity to maintain learners' motivation.

SUB-CATEGORIES		PROCESS QUESTIONS	STRATEGIES
		ATTENTION **Capturing the interest of learners; stimulating the curiosity to learn.**	
A1	Perceptual Arousal	What can I do to capture their interest?	Create curiosity, wonderment by using novel approaches, injecting personal and/or emotional material.
A2	Inquiry Arousal	How can I stimulate an attitude of inquiry?	Increase curiosity by asking questions, creating paradoxes, generating inquiry, and nurturing thinking challenges.
A3	Variability	How can I maintain their attention?	Sustain interest by variations in presentation style, concrete analogies, human-interest examples, and unexpected events.
		RELEVANCE **Meeting the personal needs/goals of the learner to effect a positive attitude**	
R1	Goal Orientation	How can I best meet my learner's needs?	Provide statements or examples of the utility of the instruction and either present goals or have learners define them.
R2	Motive Matching	How and when can I provide my learners with appropriate choices, responsibilities, & influences?	Make instructions responsive to learner motives and values by providing personal achievement opportunities, cooperative activities, leadership responsibilities, and positive role models.
R3	Familiarity	How can I tie the instruction to the learner's experiences?	Make the material and concepts familiar by providing concrete examples and analogies related to the learner's work.
		CONFIDENCE **Helping the learners believe/feel that they will succeed and control their success.**	
C1	Learning Requirements	How can I assist in building a positive expectation for success?	Establish trust and positive expectations by explaining the requirements for success and the evaluative criteria.
C2	Success Opportunities	How will the learning experience support or enhance the learner's beliefs in their competence?	Increase belief in competence by providing many, varied, and challenging experience which increase learning success.
C3	Personal Control	How will the learners clearly know their success is based on their efforts and abilities?	Use techniques that offer persona control and provide feedback that attributes success to personal effort.
		SATISFACTION **Reinforcing accomplishment with rewards**	
S1	Natural Consequences	How can I provide meaningful opportunities for learners to use their newly acquired knowledge/skill?	Provide feedback and other information that reinforces positive feelings for personal effort and accomplishments.
S2	Positive Consequences	What will provide reinforcement to the learner's successes?	Use verbal praise, real, or symbolic rewards, and incentives, or let learners present the results of their efforts to reward success.
S3	Equity	How can I assist the students in anchoring a positive feeling about their accomplishments?	Make performance requirements consistent with stated expectations, and provide consistent measurement standards for all learners' tasks and accomplishments.

Figure 1: The ARCS Motivational Model categories, Process Questions, and Strategies (Keller, 1987)

The ARCS Motivational Model Applications

The ARCS motivational design model has been widely applied to multiple learning environments on different subjects. It has been used in different educational settings, from schools to higher education to adult professional development. The main purpose of this model is to motivate students' learning determination. Researchers and practitioners have applied the ARCS model into their teaching to examine its effect on learners' motivation, attitudes, and learning achievement. Chanlin (2009) used the ARCS model as a framework to identify students' motivational problems in an information technology lesson then designed a new lesson using the ARCS model at a university in Taiwan in order to deal with those problems. The author also found a positive relationship between students' involvement in the lesson and their achievement. Kurt and Kecik (2017) conduct a similar study to support the study the effects of ARCS motivational model on university students' motivation. They applied ARCS motivational model strategies to the instructional design via detailed lesson plan. The result of the study revealed a significant increase in the students' motivation.

Studies also examined the effects of on utilizing specific techniques or tools, designed incorporating ARCS strategies. Hodges and Kim (2013) designed ARCS enhanced videos and implemented them into a blended college Math course. They used a true experimental design approach to investigate the differences in learning achievement, attitudes toward Math, and course interest between the experimental and control groups. Results showed that the experimental group had higher positive attitudes toward Math but no difference in achievement or course interest. The authors suggested that in addition to the ARCS model, multimedia design principles should be integrated into the interventions to improve student learning.

The ARCS Motivational Model also being implemented in the different learning environment. Wongwiwatthananukit and Popovich (2000) believed that instruction, even when designed and based on sound instructional principles, often times does not stimulate students' motivation to learn. Thus, they introduced ARCS Model into the pharmaceutical educator's instruction in order to help the educator identify components of instruction that either increase or decrease student motivation to learn. It is also intended to provide motivational strategies which educator can

incorporate into the instruction plan to make it responsive to the interests and needs of students. They highly recommended motivational design and strategies should be embraced by every educator to enhance students' learning and achievement, and also for their skill development. Bae et al. (2005) implemented ARCS strategies to stimulate and maintain learner's motivation in mobile learning settings. The design and content of the mobile learning system were constructed using the strategies and proven that the system helps the student to attain their learning goals more easily. Lee and Kim (2012) work on the development of Web-based courseware for the motivation of elementary school underachievers in mathematics learning. The courseware is expected to replace the existing courseware for underachievers learning number sense because the motivational focus for the learners is reflected in the functions and features of the courseware. Existing Web-based courseware rarely meets the needs of underachievers, mainly by not considering the role that motivation plays in this group. They incorporated motivational design strategies derived from ARCS Model. Throughout the study, they highlighted the importance to keep a balance between contents and motivation strategies.

Most of the distance learning organizations are facing challenges with the high non-completion rate of courses offered due to lack of motivation. Today, these organizations are also taking advantages on the effectiveness of The ARCS Motivational Model. Malik (2014) claimed that systems which are developed topic the ARCS Model raise the attention of the students during instruction, develop a relevance to the students' requirements, create a positive expectation for success and help to have a satisfaction by reinforcing success. Online learning also comes with inherent challenges. Marshall and Wilson (2013) conducted a case study on ARCS Model application to e-learning module design. Their research demonstrated that each of the motivational elements promotes learner persistence and ultimately, mastery of e-learning content.

THE ARCS MOTIVATIONAL MODEL APPLICATION IN MOOC

Management Information System (MIS) course is a study of information systems which focusing on their use in business and management. This course provides the students with the leading edge

perspectives on the business and management uses of information systems. MIS MOOC is developed based on OpenLearning platform (https://www.openlearning.com). OpenLearning is a for-profit educational technology institution based in Australia that offers a social online learning platform that can deliver massive open online courses (MOOCs). They have worked with the University of New South Wales and Taylor's University to deliver the first MOOCs in Australia and Malaysia respectively (https://en.wikipedia.org/wiki/OpenLearning).

The main intention of developing MIS MOOC is to address the learner's motivation issue. Most of the learners who enrolled for this course was non-computing background students. They are having a problem in understanding the concept and memorizing the fact. These problems demotivate and affect students' performance. With MOOC, students can learn anytime and anywhere. To encourage the students to learn with MOOC, they need to be motivated. Therefore, ARCS Motivational Model is applied throughout the development of MIS MOOC. Figure 2.0 shows the overall structure of MIS MOOC, and Figure 3.0 is the screenshot of MIS MOOC module.

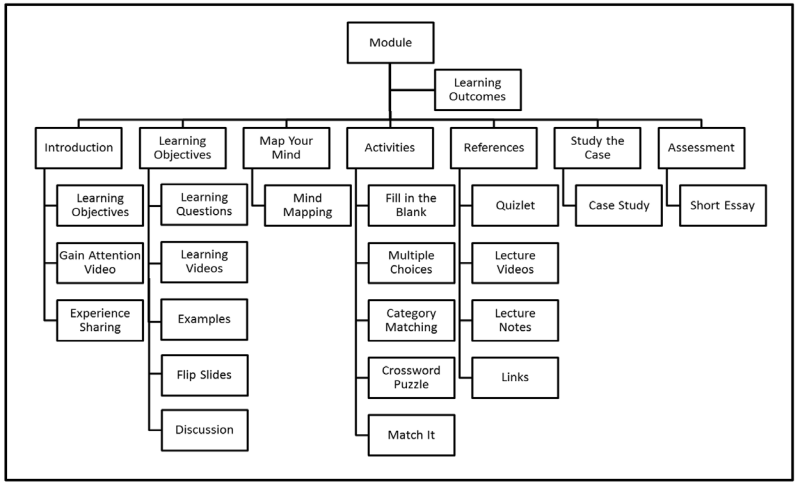

Figure 2: The Structure of MIS MOOC

Figure 3: MIS MOOC Module Screenshot

In summary, MIS MOOC was developed based on the four major components defined in ARCS Motivational Model (Keller, 1987) that influence the motivation to learn. These components are related to two important questions in course development. The questions are:

i. What will you do to make this instruction valuable and stimulating for your learners?
ii. How will you help your learners succeed and feel that they were responsible for their success?

The following sections explain how these two major questions were addressed in MIS MOOC.

Attention

Keller (1987) defined attention, as "capturing the interest of learners; stimulating the curiosity to learn". Attention-getting strategies deal with human characteristics such as the orienting reflex, curiosity, and sensation seeking. Boredom is the opposite aspect of attention. There are specific activities that will help to avoid the condition and were clustered into three

subcategories.

The first subcategory is perceptual arousal. Perceptual arousal is one type of curiosity. To cater this element, the learning session begins with the Introduction Page of the topic which describes the learning objectives. The purpose of this page is to provide a brief idea to the learners about the topic that they will learn. A general and interesting topic related Gain Attention Video was posted. Learners were asked to respond to the video by sharing their experience related to it. This is how the author ties the learners and the topic together, by injecting personal materials. The deeper the learners can relate the topic to themselves, or their daily activities, the higher potential for the course to be completed.

The next subcategory is inquiry arousal, which is how to sustain learners' attention. To sustain attention, a deeper level of curiosity is activated. Learning materials were arranged according to the Learning Questions of every Learning Objectives. In Learning Objectives pages, learners were presented with numerous learning videos. As a warming-up activity, learners need to answer few questions, which includes problem situation solving. This kind of activity can be resolved only by knowledge-seeking behaviour.

Variability is the third subcategory in attention. Different approaches were used in delivering the content to the learners. Instead of learning videos, MIS MOOC also incorporates Web 2.0 tools such as Flipsnack in providing reading materials for the learners, Youtube videos and Blog links to support the topic with examples. Learners' were also encouraged to have the discussion among them.

Relevance

Keller (1987) emphasized that relevance as a powerful factor in determining what we are motivated to learn, or what we are willing to continue paying attention to after our attention has been aroused or stimulated. Relevance is referred to as "accomplishing personal goals and responding to people's perceived needs" (Keller, 1987). Relevance-producing strategies were applied to build bridges between the subject matter and the learner's needs, wants, and desires.

Goal orientation strategy is used to relate the benefits of the course to the learners' daily activities or future career. This is applied throughout the Introduction and Learning Objective pages. More discussion happens in these pages to make sure learners understand how the concept and skills are related to their goals. The discussion is steered by the listed learning questions.

Motive matching focus on providing learners with appropriate choices, responsibilities, and influences so that it will match the learners' learning styles personal interests. It refers more to the how the course is taught than what is taught. Different teaching activities have been applied into this MOOC. In Learning Objectives, Activities, Map Your Mind, and Study the Case page, individual competitive activities such as discussion, quizzes, and mind mapping help make the course more appealing, independent of the content. In fact, these activities also help stimulate interest in the topic.

People enjoy more about things they already believe in or are interested in. Familiarity is the third strategy to generate relevance. In this course, several examples related to the topic. This is how the author links the course content to the learner's experiences. Learners also encouraged sharing their understanding of the topic in the Map Your Mind page.

Confidence

The fear of failure and the attraction of achievement are opposing forces that have a huge influence on motivation. Confidence involves the level of learners believe or feel that they will succeed and control their success. Confidence building strategies help in building learners' confidence and remove fear and anxiety.

The first strategies are through learning requirements. The simplest ways are by letting the learners know what is expected of them. Therefore, the author highlights the learning outcomes in every module, learning objectives in the Introduction page, and also learning questions in every Learning Objectives page, so that learners will always be on the right track. The session begins with warm-up activities such as experience sharing and

discussion on the topics in order to build trust. At the end of every module, learners are required to complete their Activities page which comprises of different type of exercises include a crossword puzzle, category matching, fill-in-the-blank, multiple choices, and match-it. There is also References page for learners with supporting materials to refer to which include online activity links such as Quizlet, lecture video, downloadable lecture notes, and list of references. Learners also encouraged sharing other topic related materials on this page.

After establishing the confidence for success, it is important for learners to actually succeed. Success opportunities may be different from one to another. People who are learning something new would expect frequent feedback that helps them to succeed while, those who are mastering the basics, they might expect for challenges to help them sharpen their skills. The bottom line here is to avoid boredom. After completing all the stated learning objectives for every module, learners are required to complete four different activities. Map Your Mind to extract their understanding on the concept, and then proceed to Activities for content exercises, Study the Case to apply the new knowledge, and finally a graded assessment to test on the whole understanding. They may proceed to the next module once they have completed the whole activities.

It is important for learners to have as much personal control of their learning environment. To enhance motivation, learners should be independent enough to learn and practice new skills and knowledge. Experiential learning activities such as discussion and exercises which require a learner to do problem-solving provide a situation where the learner has to apply personal control to succeed. Instead of that, active and corrective feedback from the instructor also helps learner to identify their mistake and take corrective action.

Satisfaction

The final step is in the motivational process is to create satisfaction so there will be continued motivation to learn, and recommendations of the course to other people. Satisfaction is a category that concentrates on helping learners feels positive about their achievement. This involves combining

appropriate external rewards with the challenge of providing opportunities to achieve internal rewards in the areas of natural consequences, positive consequences, and equity.

Natural Consequences or intrinsic reinforcement encourage and support intrinsic enjoyment of the learning experience. In Assessment and Study the Case page, the instructor provides opportunities to the learners to apply their newly acquired knowledge through Short Essay, and Case Study. Through Learning Objectives pages, learners are encouraged to discuss among themselves about the topic. This is to provide positive recognition to the learners by giving them the opportunity to assist other learners and at the same time acknowledge the learner's effort to learn. Instead of that, learners' also encouraged sharing their source of knowledge through References page where they can contribute to the reference list.

Positive consequences or an extrinsic reward is to provide positive reinforcement and motivational feedback to the learner. Learners like to have some feeling of control over their situation, and at the same time, they also appreciate the external recognition that helps support what they are doing. There are different types of recognition given in this course include Kudos, Badges, and Certificate of Completion. Kudos points are awarded to the learner by the community. They receive kudos for contributing quality content that might be helpful and informative for other people via comments and content pages. Kudos can be earned by commenting or adding content pages. Badges are created by the instructor based on different criteria such as Good Learner, Active Learner, Excellent Leaner, and Super Learner. Learners will receive their badges once the criteria are met, or manually issued by the instructor. Certificate of completion is assigned to the learners who manage to complete the course.

The final strategy in satisfaction is equity, demonstrating fair treatment among students. This is achieved by making performance requirements consistent with stated expectations and provides consistent measurement standards for all tasks and accomplishments. The instructor needs to actively involved and constantly provide evaluative feedback for every activity using specified criteria.

CATEGORIES & SUB-CATEGORIES		PAGE	STRATEGY
ATTENTION			
A1	Perceptual Arousal	– Introduction	– Get Attention Video – Experience Sharing
A2	Inquiry Arousal	– Learning Objectives	– Learning Videos – Discussion
A3	Variability	– Learning Objectives	– Learning Videos – Examples – FlipSlides – Discussion
RELEVANCE			
R1	Goal Orientation	– Introduction – Learning Objectives	– Experience Sharing – Learning Questions – Discussion
R2	Motive Matching	– Learning Objectives – Activities – Map Your Mind – Study the Case	– Discussion – Exercises – Mind Mapping – Case Study
R3	Familiarity	– Learning Objectives – Map Your Mind	– Examples – Discussion – Mind Mapping
CONFIDENCE			
C1	Learning Requirements	– Introduction – Learning Objectives – Activities – References	– Learning Outcomes – Learning Objectives – Experience Sharing – Learning Questions – Discussion – Quizzes – Quizlet – Lecture Videos – Lecture Notes – Links
C2	Success Opportunities	– Map Your Mind – Activities – Study the Case – Assessment	– Mind Mapping – Quizzes – Case Study – Short Essay
C3	Personal Control	– Learning Objectives – Activities – Map Your Mind – References – Study the Case – Assessment	– Discussion – Quizzes – Mind Mapping – Links – Case Study – Short Essay
SATISFACTION			
S1	Natural Consequences	– Learning Objectives – References – Study the Case – Assessment	– Discussion – Links – Case Study – Short Essay
S2	Positive Consequences	– Learning Objectives	– Kudos – Badges – Certificate of Completion
S3	Equity	– Learning Objectives – Map the Mind – Study the Case – Assessment	– Discussion – Mind Mapping – Case Study – Short Essay

Figure 4: The ARCS Motivational Model in MIS MOOC

CONCLUSION

This study describes how the ARCS Motivational Model been applied to the development of Massive Open Online Course (MOOC). MOOC practitioners should think about motivation in terms of attention, relevance, confidence, and satisfaction, which are the four major categories of influence on the motivation to learn. Nowadays, teaching would be a very challenging task, especially in an online environment. The instructor, mostly also an educator, can teach and share their experience well with the learners. But, learners might not learn if they are not interested in what they need to learn. The consequences are that they may not use and apply the knowledge and skills that they have learned, unable to contribute a positive influence on the society and pursue the goal of life-long learning. Therefore, using motivational strategies help learners to understand the importance of the course. Motivational design and strategies should be embraced by MOOC practitioners in order to enhance student learning and achievement and skill development.

REFERENCES

Aşıksoy, G., & Özdamlı, F. (2016). Flipped Classroom Adapted To The ARCS Model Of Motivation And Applied To A Physics Course. Eurasia Journal of Mathematics, Science & Technology Education, 12(6).

Bae. Y.K, Lim. J.S., & Lee. T.W. (2005). Mobile Learning System Using the ARCS Strategies. In Proceedings of The Fifth IEEE International Conference On Advanced Learning Technologies (ICALT'05)

Barak, M., Watted, A., & Haick, H. (2016). Motivation to Learn In Massive Open Online Courses: Examining Aspects of Language and Social Engagement. Computers & Education, 94, 49-60.

Bekele, T. A. (2010). Motivation and Satisfaction In Internet-Supported Learning Environments: A Review. Journal of Educational Technology & Society, 13(2), 116–127.

Chanlin, L. J. (2009). Applying Motivational Analysis In A Web-Based

Course. Innovations in Education And Teaching International, 46(1), 91-103.

Clayton, K., Blumberg, F., & Auld, D. P. (2010). The Relationship Between Motivation, Learning Strategies And Choice Of Environment Whether Traditional Or Including An Online Component. British Journal Of Educational Technology, 41(3), 349–364.

Ejreaw, A.M., & Drus, S.M. (2017). The Challenges of Massive Open Online Courses (MOOC) – A Preliminary Review. In Proceedings of The 6th International Conference On Computing And Informatics (ICOCI 2017).

Hart, C. (2012). Factors Associated With Student Persistence in an Online Program of Study: A Review of the Literature, 11(1), 20-42.

Hartnett, M., St. George, A., & Dron, J. (2011). Examining Motivation In Online Distance Learning Environments: Complex, Multifaceted, And Situation-Dependent. International Review of Research in Open and Distance Learning, 12(6), 20–38.

Hodges, C. B., & Kim, C. (2013). Improving College Students' Attitudes Toward Mathematics. Techtrends, 57(4), 59–66.

Huang, B., & Hew, K. F. (2017, April). Factors Influencing Learning and Factors Influencing Persistence: A Mixed-Method Study Of MOOC Learners' Motivation. In Proceedings of The 2017 International Conference on Information System and Data Mining (Pp. 103-110). ACM.

Huang, B., & Hew, K. F. T. (2017). Measuring Learners' Motivation Level in Massive Open Online Courses. International Journal of Information and Education Technology.

Jordan, K. (2014). Initial Trends in Enrollment and Completion Of Massive Open Online Courses. The International Review of Research in Open and Distributed Learning, 15(1).

Jordan, K. (2015). MOOC Completion Rates: The Data, Retrieved 27th July 2013, Available at: http://www.katyjordan.com/moocproject.html

Keller, J. M. (1979). Motivation and Instructional Design: A Theoretical Perspective. Journal of Instructional Development, 2(4), 26–34.

Keller, J.M. (1987). The Development and Use of The ARCS Model Of Motivational Design. Journal of Instructional Development, 10(3), 2-10.

Keller, J.M. (2010). Motivational Design For Learning And Performance: The ARCS Model Approach. Springer Science & Business Media. DOI 10.1007/978-1-4419-1250-3_3.

Khalil, H., & Ebner, M. (2014). MOOCs Completion Rates and Possible Methods To Improve Retention-A Literature Review. In World Conference on Educational Multimedia, Hypermedia And Telecommunications (Vol. 1, Pp. 1305-1313).

Kilavuz, A. (2011). Learning, Motivation and Instructional Designs: A Literature Review and Suggestions for Future Research. Doctoral Dissertation. University Of Sydney.

Kurt, P. Y., & Keçik, İ. (2017). The Effects of Arcs Motivational Model on Student Motivation to Learn English. European Journal of Foreign Language Teaching.

Lee, J., & Kim, Y. (2012). Development of Web-Based Courseware Applied ARCS Model. Busan National University of Education. Busan.

Li, K. (2015). Motivating Learners in Massive Open Online Courses: A Design-Based Research Approach .Doctoral Dissertation. Ohio University.

Liao, H. C., & Wang, Y. H. (2008). Applying the ARCS Motivation Model in Technological and Vocational Education. Contemporary Issues in Education Research, 1(2), 53-58.

Malik, S. (2014). Effectiveness of ARCS Model of Motivational Design to Overcome Non-Completion Rate of Students in Distance Education. Turkish Online Journal of Distance Education, 15(2), 194-200

Marshall, J., & Wilson, M. (2011). Motivating E-Learners: Application Of The ARCS Model To E-Learning For San Diego Zoo Global's Animal Care Professionals. Malala Yousafzai, 21.

Mihalec-Adkins, B., Hicks, N., Douglas, K. A., Diefes-Dux, H., Bermel, P., & Madhavan, K. (2016, October). Surveying The Motivations Of Groups Of Learners In Highly-Technical STEM MOOCs. In Frontiers in Education Conference (FIE), 2016 IEEE (Pp. 1-6). IEEE.

Ministry Of Education Malaysia (2015). Malaysia Education Blueprint 2015-2025 (Higher Education). Ministry Of Education Malaysia.

Moore, M. G., & Kearsley, G. (2011). Distance Education: A Systems View of Online Learning. Belmont. CA: Wadsworth Cengage Learning.

Nordin, N., Embi, M.A., & Norman, H. (2015). Malaysia MOOCs: The Way Forward. MOOCs and Educational Challenges Around Asia And Europe, 87.

Park, J.-H., & Choi, H. J. (2009). Factors Influencing Adult Learners' Decision To Drop Out Or Persist in Online Learning. Educational Technology & Society, 12(4), 207–217.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. Contemporary Educational Psychology, 25(1), 54–67.

Shellnut, B., Savage, T., & Knowlton, A. (1998). Using the ARCS Model to Design Multimedia College Engineering Courses.

Song, S. H. (2000). Research Issues Of Motivation In Web-Based Instruction. Quarterly Review of Distance Education, 1(3), 225–29.

Wongwiwatthananukit, S., & Popovich, N. G. (2000). Applying the ARCS Model Of Motivational Design To Pharmaceutical Education. American

Journal of Pharmaceutical Education, 64(2), 188.

Zheng, S., Rosson, M. B., Shih, P. C., & Carroll, J. M. (2015, February). Understanding Student Motivation, Behaviors, and Perceptions in MOOCs. In Proceedings of The 18th ACM Conference on Computer Supported Cooperative Work & Social Computing (Pp. 1882-1895). ACM.

Supporting Learner Driven Learning In Malaysian Higher Education

Nor Aziah Alias

Abstract : Enormous changes are taking place in the 21st century. The fourth industrial revolution termed as Industry 4.0 will definitely change the education landscape and will transform higher education. The internet, cloud computing and the advances in robotics are major game changers that have spurred big data, accessible content, ubiquitous learning, global learning and the Internet of Things. According to Fisk (2017), Education 4.0 is inevitable and among many things

INTRODUCTION

Learning is now becoming an activity that can happen anywhere, any place, anytime, anyhow, on any device, in any context, with anyone, facilitated by anybody and through any path. The idea of a university life attending lectures in a hall for the duration of three to four years before venturing out into the world is essentially dead. Colleges and universities are evolving from being the center of knowledge dissemination to supporters of students' education (Leef, 2016). The Malaysian higher education is also undergoing a transformation in response to the Volatile, Uncertain, Complex and Ambiguous (VUCA) world. Amidst all the looming changes, the Malaysian learners are given the opportunity to be involved in the provision of flexible curriculum that encompasses ubiquitous learning, work based learning, local and global mobility and many more. The Malaysian Higher Education Blueprint (2015-2025) put forward ten shifts to transform higher education. Global online learning is one of the shifts; universities have been harnessing the talent of academics to develop and offer massive open online courses that can connect the learners to their counterpart from across the world. The readiness of the learners to respond to the dynamism of this exciting era is however, still very much left unexplored.

The main objective of the chapter is to deliver an idea of learning that is self-driven and to situate it within the context of Malaysian learners. Voices of these learners extracted from a two-year classroom research are incorporated

in the chapter. Data were gathered from four groups of Malaysian students who were studying research methodology. They were given open ended questions on their views on meaningful and significant learning. In total, sixty eight (68) students provided qualitative data that were analyzed and themes generated. Figure 1 illustrates the themes generated. The learners find learning meaningful and significant when it is authentic and involves diverse, active processes of change that are both socially and personally relevant. The findings are used to design learning in the subsequent semesters and as previously mentioned, are also assimilated in this chapter.

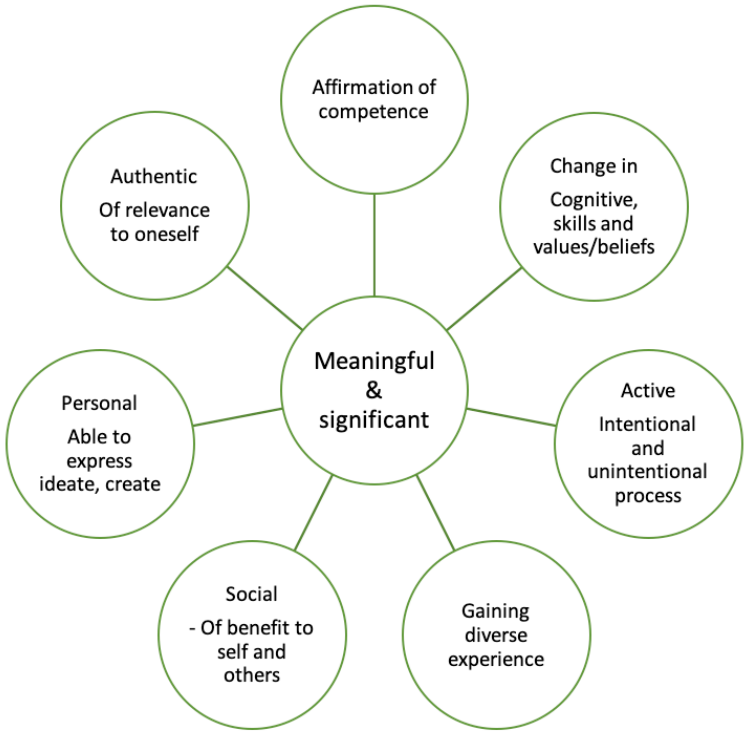

Figure 1: Generated Themes

A brief snapshot of the Malaysian learners is presented before advancing to the main sections of the chapter.

THE ASIAN LEARNERS

The attributes of the Malaysian learners vis a vis the Asian learners have been studied for many years. In a tribute to David Watkins, Springer publishes a Festschrift that deliberates on the many aspects of learning among Asian learners including motivation, efficacy and academic self-concept. The uniqueness of the Asian learners have been identified by Densten (2017), Yeung, Han and Lee (2016), Ho (2009), Gan (2009), Alias (2007) and Mcinerney (2006) to be

1) Teacher –reverence
2) Respect for knowledge
3) Lower self efficacy and self concept
4) Remain humble and avoid arrogance
5) Good at repetitive learning - Good at memorizing data
6) Seek perfection and affirmation of competence
7) Seek harmony
8) Cooperative – group work , relying on capable members

In particular, teacher reverence is very much apparent among the Asian learners.

In an online or distance learning environment, Sangra, Porto and Jung (2015), Nong (2013) and Jung (2012) found that the Asian learners tend to look for teacher support, lurk in silence and seldom initiate discussion. Questions are normally directed to the instructor and not to the group. Past experience showed that when facing difficulties with the course, the learners tend to send personal email to the instructor rather than discussing it in the group forum. The Asian learners value student-instructor interaction; this is aligned to the notion of respecting the 'teacher. Asian learners were more comfortable in environments that had a strong, visible teacher presence. Wee and Quek (2014) found adult learners to be less ready for online environment due to their past learning experiences which were mostly teacher-centered environment.

The findings from later studies of Asian online learners have increasingly skewed to less dependent tendencies among the learners as depicted in Jung and Suzuki (2014) and Jung and Gunawerdana (2015). However, the shift

is at a slower pace and is not in tandem with the era of rapid change. The 21st century learning requires learners to communicate and collaborate and most importantly, become independent learners. Cultural traits should not inhibit or hold these learners back. They must be able to drive their own learning and be at par with other learners as they converge to a common global platform.

In the next section, the author will discuss learner driven learning and how it fits into the 21st century learning landscape.

LEARNER DRIVEN LEARNING

In 1999, Altbach and Peterson posited that higher education in the 21st century is about the broadening of a young person's cultural horizons, increasing their capacity to think and work globally, and the creation of opportunities for them to participate in making the world a less dangerous place. Their statement became a reference in many literature and is still very much relevant today. The 21st century is about the many opportunities to learn beyond the traditional classroom; it is about the young person's driving his or her own learning and development.

In essence, learning entails the changes that take place when the learner interacts with the content and gain experiences in a learning environment whereby the instructor and peers actively interact. These learning outcomes may be cognitive, psychomotor and affective; the main idea is to make sense of the world he or she lives in. Findings from a qualitative study done over four semesters with different groups of learners show that learners see learning as meaningful when there are reciprocal interactions between the learners, peers and instructors, applications to their real life, relevance to what is 'close to their heart' and spaces where they can ideate and create. A student wrote

> *"Meaningful learning to me is when learning activities relate with ICT because it gives me a space for expressing my own ideas, designs and I can create"..*

Another stated

> *"...look out for progress other than the final product, start to trust on*

what (the learners) are doing (to learn). What's more important than truth and freedom?"

These are instances when students are more driven towards meaningful process, ownership and expression of self. These are attributes that can be expected from many other 21st century learners.

Figure 2 below illustrates basic dimensions that must be duly scrutinized to ensure learning happens. The self includes psychological aspects of grit, attitude, motivation, drive, interest and many more that are beyond the limit of discussion in this chapter.

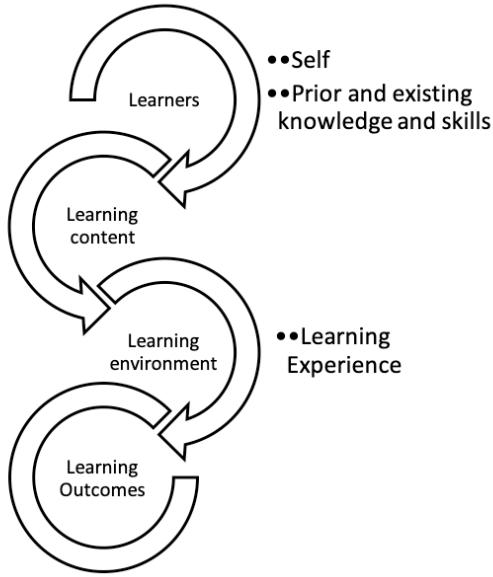

Figure 2: Basic Dimensions

In learner driven learning, the learner charts his or her learning path and orchestrates his or her learning by pacing themselves. Watkins (2009) wrote:

"We have an idea for a destination – perhaps a bit of a map of the territory; we have hands on the wheel, steering – making decisions as the journey unfolds; and all this is crucially related to the core process of noticing how it's going and how that relates to where we want to be" (Watkins, School Leadership Today, 2009)

Learner driven learning thus, means planning, monitoring, and reflecting and knowing what one wants out of learning. How is learner driven learning different from learner centred learning and self-directed learning? All three terms have psychological connotations i.e the self. Learner driven learning however is more than just placing the student at the centre or the student ability to direct his or her learning, Learner driven learning requires the motivation, the internal drive to initiate and to propel one's learning into a more personalized space and at a personal pace. As stipulated by Watkins (2012), when learners drive their own learning, it leads to greater engagement and intrinsic motivation for them to want to learn. They set a higher challenge for themselves, they evaluate their own work, and they have better problem-solving skills.

Bray and McClaskey (2013) build on personalization as an instance where the learner drives his or her own learning and connects learning with interests, passions, and aspirations. In addition, this learner employs assessment as learning. As a person who drives his or her own learning, the learner further self-directs and self-regulates his or her learning. He or she has a voice and values choices about his or her learning. Bray and McClaskey (2013) developed several continuums to illustrate how learners move from teacher centered to learner centered and to learner driven. Continuum of ownership is one of them. In the depiction of this continuum, a learner is seen to move from compliance to autonomy.

How then is learner driven or student driven learning relevant in the new era? The learners in the post 2020 must not be overwhelmed with the Volatile, Uncertain, Complex and Ambiguous (VUCA) world, so much so they would not know what to do. They must be able to respond positively to change, to leverage on technology to apprehend the uncertainties and keep them posted. Lifelong and life wide learning become indisputably important. Adhering to a set of rigid syllabi and learning within the confines of time and space will actually be debilitating for a learner in a VUCA world. The learner must thus, take charge.

As advocated by Glatter, Deruy and Wong (2016), the 21st century classroom is to align the core of new learning models, which are the principles of student agency, flexibility and choice. This echoes well with learner driven learning where agency is seen as the crux of the learner's ability to be

successful in the 21st century learning environment.

The Notion of Learner Agency

Learner agency refers to the actions learners can and do to influence their learning (Annan, 2016). This relates to the control, autonomy, and power that a learner experiences in learning circumstances. That agency is the opposite of helplessness; it is the "capacity and propensity to take a purposeful initiative". He further explained that young people tend to seek meaning and act with purpose in order to attain their desired conditions in not only their own but also others' lives. Hence, they "do not respond passively to their circumstances" as someone with high levels of agency (Ark, 2005).

Agency as the ability to act with initiative and effect in a socially constructed world was earlier suggested by Hunter and Cooke (2007). The idea of social interaction is also apparent in a report by Klemencic, Bergan and Primozic (2015) who describe agency as the quality of students' self-reflective and intentional action and interaction with their environment that encompasses variable notions of power and will.

The learner acts as his or her own agent and is not independent of their environment. Clark and Taylor (2017) put forward a framework that situates learner agency as emerging internally with the learners own set of beliefs and ambitions but the learner's external influences and relative practices play contribute to learner agency. The challenge is however to convince the learners that they are actually capable of learning anything they want to. Since learner agency differs at different stages, support and regulation become necessary. Hence, the learning environment that includes the peers and the instructors is significantly important.

Learner Voice and Choice

Learner voice and choice are two other elements that are crucial for the personalization of learning (Bray & McClaskey, 2013). Rudd, Colligan and Naik (2006) define giving the learners voice as by providing appropriate ways of listening to their concerns, interests and needs in order to empower learners. Giving the learners voice also includes respecting everyone's say,

considering their perspectives and ideas of learners, taking risks, sharing, listening, engaging and working together in partnership (Rudd, Colligan & Naik, 2006, p.8).

The UK government espouses providers to improve their teaching, learning and assessment, by drawing fully on learners' views about the teaching, learning and assessment that they receive to inform self-assessment and improvement actions (Government of UK report, 2015). For a learner to drive his or her own learning, the opportunity to be heard and to be able to offer their perspectives or even solutions to their own learning problem will be a tremendous plus.

A rigid learning scheme and a pre-determined schedule will not associate well with the notion of voice and LDL. Thus flexibility and choices become essential. By having alternatives and options, the learner's learning styles and preferences are also supported.

In relation to the preceding discussion, a heutagogical approach is seen appropriate to sustain the development of learner capacity and capability with the goal of producing learners who are well-prepared for the complexities of today's workplace (Blaschke, 2012). Heutagogy is self-determined learning where learners serve as "the major agent in their own learning, which occurs as a result of personal experiences" (Hase & Kenyon, 2007, p. 112). This means moving from a pedagogic model of learning (teacher-focused) toward andragogic and ultimately heutagogic model of learning. It is also in tandem with what the learners view as meaningful and significant learning. However, due to the the prior experience of the Malaysian learners and learners being independent at different paces, supporting the learners cognitively, metacognitively and affectively is pertinent.

The next section will focus on scaffolding, a process where support is made available to the learners and removed as they become fully capable of driving their own learning.

SCAFFOLDING TOWARDS LEARNER DRIVEN LEARNING

The concept of scaffolding is grounded in Vygotsky's (1978) concept of assisted learning and learning potential as described by the zone of proximal development. The term scaffolding however, was introduced by Wood, Bruner, and Ross (1976) to mean tutoring or other assistance provided in a learning setting to assist students with attaining levels of understanding impossible for them to achieve without assistance. The idea of scaffolding is similar to having structures erected alongside buildings to support construction workers and later removed when the building is completed. Scaffolding involves providing learners with more structure during the early stages of a new learning venture and gradually turning responsibility over to them as they become independent in their learning environment. A scaffold bridges the gap between what students can do on their own and what students can do with guidance from others.

Scaffolding is thus, a process in which a teacher/instructor/facilitator supports students cognitively, motivationally or emotionally while helping them to further develop independence and self-direction.

Scaffolding Towards LDL

Many studies concurred on the necessity of scaffolds in a learner centred learning environment (Winnips, 2001; McMahon, 2002; Brush & Saye, 2002; Boyer & Maher, 2004; Bárcena & Read, 2004; Alias, 2007; Sharma & Hannafin, 2007; Livengood, Lewallen, Leatherman & Maxwell, 2012; Stecklein, 2014). As LDL is very much an extension of learner centered learning, scaffolding is important to provide clear directions, purpose and expectations. Just as driving on a road, the learner requires a map and be certain of his/her destination.

There are many aspects to be considered when developing scaffolds to move learners towards self-driven learning. In order to provide cognitive, metacognitive and affective or motivational scaffolds, the learning environment must first be designed to be conducive for nurturing agency, and giving voice and choices.

Fundamentally, the function of the learning environment is to support personalized learning in a connected world. It must be designed with

technology tools, affordances and a wide range of resources that encourage the setting up of learning spaces that promotes access and leisure of learning. Nevertheless, the first thing to do is to ensure a safe and inclusive environment.

Setting A Safe and Inclusive Learning Environment

The instructor plays a pivotal role in assuring the learners that they have what it takes to be successful. Orientating the learners to the course in an emphatic manner is an effective way of showing one's early support. Technology makes it effortless as early words of encouragement are easily posted, shared and may remain in the learning platform until the end of the course. Acknowledging the diversity of the group by providing links to pre requisites (material, courses etc.) is a step easily taken so no one is left behind. Pacing oneself is an essential process that requires an inclusive environment. A fifty year old learner who came back to study after many years leaving college was initially apprehensive but an inclusive environment led her to succeed. At the end of the semester, she described her experience in her blog.

> *... learning has been fun even though I am decades older than my coursemates…(Anna, Edu702)*

Empathy, praise and attention experienced in the learning community instigates a sense of belonging where a group specific inclusion is felt. In addition, a sense of relatedness is experienced when learners have enough information, awareness of activities and security in relationships with their peers. Ultimately, a sense of connectedness is apparent as learners share, and work together in tandem. Once a safe and inclusive environment that connects learners, instructors and resources is in place, scaffolding towards learner driven learning becomes easy.

Below are scaffolding processes that have proven effective by the author in her many years of facilitating online learning and expounding learner driven learning. Each of the process is supported by the underlying principles of agency, voice and choice.

Scaffolding From Instructor Reverence To Capturing Learner Voice

This is a challenging task in the Malaysian education scenario. Being part of an Eastern culture that exudes authority and very much a power-distance culture, moving from instructor reverence is quite a task. Nonetheless, it can be done by inviting more participation from the learners. An example is a move from teacher led to negotiation of tasks and activities by the learners. Learners are found to be receptive to the idea of providing their ideas and completing tasks they choose as long as the outcomes remain the same. In this case, the lecturer or instructor must first be ready to slowly surrender his or her traditional role.

Scaffolding from instructor centric to learner centric tasks

To support LDL, an instructor or a teacher needs to envisage learner centered teaching as the mainstay of his or her teaching. Learners have different styles and preferences. They come in with different levels of knowledge and varied experiences. The idea of outcomes to be achieved must precede uniformity of tasks or assignments. For example, a video proposal in contrast to a written proposal is more appealing to visual learners.

Scaffolding from textbook learning to relevant and authentic learning

This follows the above recommendation. Relevance is key in a learner driven learning environment. By focusing on real world complex problems, learners are more driven towards finding solutions and understanding the implications on theirs and other people's lives. This also allows the learners to delve into relevant experiences and more often than not, satisfies their intrinsic needs or goals. A student narrated,

> *..learning is meaningful when when I acquire knowledge that i am most passionate about, something that is super personal, close to my heart and will weigh significant impact - not only directly to me but also will benefit my family, friends.. (Maria, Edu 702)*

Scaffolding from transmission of content to learner created content

Content is everywhere. Learning is not about taking down notes from a learned person in a physical space at a specific time anymore. Making content and facts discoverable rather than transmitted is a tactic that eventually leads to the learner being more participative in his or her learning. Students initiating a debate or student led discussions are applicable measures to support leaner agency. As learners curate and synthesize their knowledge, they are able to propose and construct new content – a valuable skill needed in the 21st century. For instance, learners who develop portfolios and Wikis tend to be more reflective; their ability to scrutinize existing practices and project new ideas is apparent (Zubizaretta, 2008; Corley & Zubizaretta, 2012; Burns & Buza, 2016)

Scaffolding from disciplining to regulating

A notable strategy to support learners to drive their own learning is to move from the traditional classroom disciplining to regulating learning. Setting class attendance requirement for instance, will soon be unheard of. Once learning outcomes are agreeable to the learners, regulating learning may include

a. Tracking and reminding
b. Giving marks for participation
c. Giving freedom to initiate
d. Providing individual feedback
e. Allowing learners to showcase
f. Rewarding competence

An important aspect to consider is regulation of motivation (Alias, 2007). This requires an in-depth discussion and is not within the scope of this chapter. Suffice it to say that for a learner to sustain his or her motivation to learn, the preceding listed items plus effort such as environmental restructuring is imperative.

Scaffolding from passive classroom learning to active, learning in a community

A constructivist approach that requires learners to be more active such as problem based and project based will lead them to be more independent of the instructor while engaging them to work as part of a team. These and other forms of active learning in a community would be a potential formula for learner driven learning. These types of learning are less effective when confined to a classroom or strictly following a class schedule. A simple example is to flip and make learning seamless. Learners are given group tasks to complete before regrouping them in an active class session. Another option is to link the learners to other learners in different parts of the world by enrolling them in a global learning platform. Wrapping a course around a MOOC will provide an initial structure. As learners become more confident, they will connect to other learners by participating in other MOOC as well. They will are be connected to multiple resources and experts.

The table 1 below summarizes the proposed scaffolding processes in relation to the three elements that frames learner driven learning.

Table 1: Proposed Scaffolding Processes

	Scaffolding	Elements supported
Set a safe and inclusive learning environment	From instructor reverence to capturing learner voice	Voice Choice
	From instructor centric to learner centric tasks	Agency Choice
	From textbook learning to relevant and authentic learning	Agency
	From transmission of content to learner created content	Voice Choice
	From disciplining to regulating	Agency
	From passive classroom learning to active, learning in a community	Agency Voice Choice

IMPLICATIONS

An obvious implication of LDL is the learning assessment. Though not directly treated in this chapter, moving from standardized assessments to authentic assessment is extremely vital in order for LDL to materialize. There must be a mix of assessment for learning, assessment as learning and assessment on learning to support the processes discussed in the preceding section.

The biggest implication of LDL is undoubtedly, a shift in mindset, especially among the educators, lecturers or instructors as we are commonly called. Roles must be varied and at times, reversed. Playing multiple roles from an instructor to a designer to a co-learner and then to a curator and a corroborator would be the appropriate thing to do rather than relinquishing all traditional roles at the same time. The learners still require 'a sign on the road' or a Waze as they maneuver and drive their own learning. The basic idea of 'teaching in the 21st century is to inspire leaner driven learning. Ultimately the students will drive on their own, not haphazardly but with a comfortable velocity (with magnitude and direction) and at times, accelerating where and when they see necessary.

CONCLUSION

The 21st century learners are expected to be self-driven learners who among other things, are thinkers, inquirers, communicators, and risk-takers. They are also likely to be reflective and balanced individuals who are ethical and have essential fluencies such as creativity and collaborative team-work skills. With the rapid technological advances, changes are volatile and at most times, uncertain. Major disruptions are taking place in the way one learns and acquires skills. The main take away from the chapter is the need for learner driven learning (LDL) in a VUCA world, and scaffolding towards LDL in a safe and inclusive learning environment. Based on research-related evidences, proven practices and the author's experience accumulated over the last seven years, the chapter promulgates that for learners to drive their own learning, they require the motivation and the internal drive to initiate. Learner agency, voice and choice are the mainstay of LDL. It is important to support the learners in strategizing their learning as a meaningful process

in a more personalized space and at a personal pace. Scaffolding from a traditional instructor centric to a learner centric approach is hence, pertinent especially in terms of delivery of content and roles of both the learner and the instructor.

REFERENCES

Alias , N.A. (2007). Design and Development of a 'learning Console' to Scaffold the Adult Online Distance Learner's Motivational Self-regulation and Self-direction, Unpublished Dissertation, International Islamic University Malaysia

Alias, N.A & Luaran, J. E (2016) (eds.). Student-driven learning strategies for the 21st century classroom, IGI Global, Hershey, PA

Altbach, Philip G & Peterson, Patti McGill, 1943- (1999).Higher education in the 21st century : global challenge and national response. Institute of International Education ; [Boston] : Boston College Center for International Higher Education, Annapolis Junction, MD

Annan, J. (2016). Student agency in interactive learning environments. Retrieved from www.positivelypsychology.co.nz

Ark , T. V. (2015). 10 Tips for Developing Student Agency. Retrieved from http://www.gettingsmart.com/2015/12/201512tips-for-developing-student-agency/

Bárcena, E. & Read, T. (2004). The Role of Scaffolding in a Learner-centered Tutoring System for Business English at a Distance, European Journal of Distance learning, Retrieved from http://www.eurodl.org/materials/contrib/2004/Barcena_Read.html

Blaschke, H.M. (2012). Heutagogy and Lifelong Learning: A Review of Heutagogical Practice and Self-Determined Learning, IRRODL 13 (1), 56-71

Boyer, N. R. & Maher, P. A. (2004). Constructing scaffolds for social online learning: Using self-directed frameworks with virtual groups, International Journal of Self-directed learning, 1(1), 26-38.

Bray, B. & McClaskey, K. (2013). A step by Step Guide to Personalize Learning. Learning & Leading with Technology, May 2013. Retrieved from http://files.eric.ed.gov/fulltext/EJ1015153.pdf

Brush, T. A. & Saye, J. W. (2002). A Summary of Research Exploring Hard and Soft Scaffolding for Teachers and Students Using a Multimedia Supported Learning Environment, The Journal of Interactive Online Learning, 1(2), 2002

Burns, E. & Buza. K. (2016). Portfolio as a Tool for Teachers' Reflective Thinking and Professional Identity Development, Evolving Pedagogy – Greetings from Finland, Retrieved from http://verkkolehdet.jamk.fi/ev-peda/2016/11/27/portfolio-as-a-tool-for-teachers-reflective-thinking-and-professional-identity-development/

Clark, D. & Taylor, N. (2017). Pioneering the New Way of Learning: Learner Agency and Opportunity, Retrieved from https://www.inacol.org/news/pioneering-new-way-learning-learner-agency-opportunity/

Corley, C. & Zubizarreta, J. (2012), The Power and Utility of Reflective Learning Portfolios in Honors, Journal of the National Collegiate Honors Council, Spring/Summer 2012 , pp.61-75, Retrieved from https://www.mnsu.edu/honors/corley_zubizarreta.pdf

Densten, I. (2017). Creating University Spaces of Inspiration: Examining the Critical Link between Leading and Lecturing. In J. Mendy (ed). Teaching Human Resources and Organizational Behavior at the College Level, IGI Global, Hershey, PA

Fisk, P. (2017). Education 4.0, Retrieved from www.thegeniusworks.com/2017/01/future-education-young-everyone-taught-together/

Gan, Z. (2009). Asian learners' re-examined: An empirical study of language learning attitudes, strategies and motivation among mainland Chinese and Hong Kong students, Journal of Multilingual and Multicultural Development, 30, Issue 1, 2009.

Glatter, H., Deruy, E. & Wong, A. (2016). Reimagining the Modern

Classroom. Retrieved from https://www.theatlantic.com/education/archive/2016/09/reimagining-the-modern-classroom/498224/

Government of UK report (2015). Improving teaching standards through listening to learners, Retrieved https://www.gov.uk/government/publications/learner-voice-improving-teaching-learning-and-assessment

Hase, S. & Kenyon, C. (2007). Heutagogy: A child of complexity theory. Complicity: An International Journal of Complexity and Education, 4(1), 111-119

Hing, W. S. (2013). Characteristics of Chinese Students' Learning Styles , International Proceedings of Economics Development and Research 62 (8), 36-39.

Ho, E. S. (2009). Characteristics of East Asian Learners: What We Learned From PISA . Educational Research Journal, 24 (2) Winter 2009

Hunter, J. & Cooke, D. (2007). Through autonomy to agency: Giving power to language learners, Prospect, 22(2), 72-88

Jung, I. (2012) . Asian Learners' Perception of Quality in Distance Education and Gender Differences, IRRODL, Vol 13, No 2 (2012)

Jung, I. & Suzuki, Y. (2014) Scaffolding Wiki-based collaboration in a multicultural Language Learning Context.

Jung, I. & Gunawerdana, C. N. (2015). Culture and Online Learning, Stylus Publishing, LLC, 16 Mar 2015

Klemenčič, M., Bergan, S., Primožič, R. (2015) (in press). Student engagement in Europe: Society, higher education and student governance (pp. 11-29). Council of Europe Higher Education Series No. 20. Strasbourg: Council of Europe Publishing.

Leef (2016). The Changing Landscape: Trends That Will Fundamentally Transform the Higher Education Institution, Retrieved from https://evolllution.com/attracting-students/customer_service/the-changing-

landscape-trends-that-will-fundamentally-transform-the-higher-education-institution/

Livengood, K., Lewallen, D. W., , Leatherman, J. & Maxwell, J. (2012). The Use and Evaluation of Scaffolding, Student Centered-Learning, Behaviorism, and Constructivism To Teach Nuclear Magnetic Resonance and IR Spectroscopy in a Two-Semester Organic Chemistry Course, J. Chem. Educ., 2012, 89 (8), pp 1001–1006

Mcinerney, D. M., (2006). The motivational profi les and perceptions of schooling of Asian students in Australia. Malaysian Journal of Learning and Instruction (MJLI), 3, 1-31

McMahon, M. (2002). Designing an on-line environment to scaffold cognitive self-regulation. HERDSA 2002. 457-463

Ministry of Education Malaysia. (2012). Malaysia Education Blueprint 2013-2025: Preliminary Report. Putrajaya: Ministry of Education.

Nong, Truong Duy, (2013). Factors Contributing to Perceptions of Southeast Asian Learners Regarding Satisfaction and Quality in Online Education, Ph.D. Dissertation, Northcentral University

Rudd,T. , Colligan, F. & Naik. R. (2006) Futurelab: Learner voice handbook. Research report. 2006. Retrieved from https://hal.archives-ouvertes.fr/file/index/docid/190332/filename/rudd-2006-learner_voice.pdf

Sangra, A., Porto, S. & Jung, I. (2015). Diversity in Expectations of Quality and Assessment, in Jung, 1. & Gunawerdana, C (eds). Culture and Online Learning: Global Perspectives and Research, Stylus Publishing

Sharma, P. & Hannafin, M. J.,)2007). Scaffolding in technology-enhanced learning environments, Interactive Learning Environments 15(1), 2007

Stecklein, J. J. (2014). Effects of interactive technology, teacher scaffolding and feedback on university students' conceptual development in motion and force concepts." PhD (Doctor of Philosophy) thesis, University of Iowa, 2014. http://ir.uiowa.edu/etd/1506.

Vygotsky, L. S. (1978). Mind in Society: the Development of Higher Psychological Processes. Cambridge, MA: Harvard University Press.

Watkins, C. (2009). Learners in the driving seat, School Leadership Today, 1(2) ,28 -31

Watkins R. (2012). A Guide to Assessing Needs : Essential Tools for Collecting Information, Making Decisions, and Achieving Development Results. Retrieved from: https://openknowledge.worldbank.org/handle/10986/2231 License: CC BY 3.0 IGO."

Wee, T. P. , Quek C. L. (2014). Are My Adult Learners Ready For E-Learning? Gwendoline National Institute, 2014 Association of Southeast Asian Institutions of Higher Learning (ASAIHL) Conference 3-5 December 2014

Winnips, K. (2001). Scaffolding-by-design: A model for WWW-based learner support.Enschede: University of Twente Press.

Wood, D. , Bruner, J. , & Ross, G. (1976). The role of tutoring in problem solving. Journal of Child Psychology and Psychiatry, 17(2), 89-100

Yeung, A. S., Han, F., & Lee, F. L. M. (2016). Reciprocal Relations Between Chinese Students' Beliefs of Competence, Effort Goal, and Academic Achievement. In The Psychology of Asian Learners (pp. 319-335). Springer Singapore.

Zubizarreta, J. (2008). The Learning Portfolio: A Powerful Idea for Significant Learning , IDEa paper 4 . Retrieved from http://www.ssphplus.info/files/IDEA_Paper_44.pdf

The Model Of Technology-Supported Learning For Special Educational Needs Learners (Motsel): Promoting Heutagogic-Inclusive Environment In Malaysian Higher Education

Roslinda Alias, Nor Aziah Alias, Johan Eddy Luaran, Mahadi Kamaludin

Abstract : In this advent of technological era, computer-related devices such as notebook, tablet and smartphone are not considered as luxury tools anymore, instead it is a necessity for everyone to continue their life in this sophisticated age. Consequently, this scenario has changed human life – from the time they wake up in the morning until they go to bed at night. For instance, workplaces are becoming more complex in nature due to the technological advancement. To be a competent personnel does not necessarily lead ones to be capable in facing the rapid changes and complexities in workforce (Hase & Kenyon, 2007). Competencies is not enough in this 21st century and capability is important for the workers to survive in the complex work setting which requires them to be more creative, dynamic and innovative in nature.

INTRODUCTION

Higher education has been urged to produce not only a competent student but also a capable personnel in future (Hase & Kenyon, 2000). Competency as described by Hase and Kenyon (2003), is a minimum requirement which enabled worker dealing with the 'rational, the linear systems'. Blaschke (2016) added, competency is the ability to show what we have learned including skills and knowledge.

On the other hand, capability is an extension of competency which enabled an individual to apply what he/she has learned in a complex environment (Blaschke, 2014). Capability is our capacity to apply the skills and knowledge we learned in 'new and unfamiliar' situation Blaschke (2016). A capable personnel has holistic characteristics that enabled him/her to face the complex environment effectively and some characteristics as highlighted by Hase and Kenyon (2003) including 'high self-efficacy,

knowing how to learn, creativity, the ability to use competencies in novel and familiar situations, possessing appropriate value and working well with others'.

The changes which demand future employers to hire from competent workers to capable workers has simultaneously impacted the world's educational setting and approach. Some of the so-called traditional teaching methods and teaching aids could no longer cater the needs of the students in schools and institutions of higher learning. Canţer, (2012) emphasized that the teaching and learning trend has moved from teacher-centred to learner-centred. The roles of educator have changed from teaching to facilitating as the information and knowledge is available on the learners' fingertip. 'Chalk and talk' method could not be regarded as the best method in education to produce competent and capable future workers as the nature of the current students are relying more on the computer-related devices.

Hence, heutagogy has been introduced in the year 2000 by Hase and Kenyon (2000) as an extension to andragogy, to suit with the needs of the students as well as to fulfil the potential employers' urgency for having not only a competent but also a capable personnel in their working environment (Blaschke & Hase, 2016).

Blaschke and Hase (2016) also pointed out that our education system "has been slow to respond to the needs of learners in preparing them for the workforce". Hence, heutagogy will benefit all students including students with disabilities (SWDs), in preparing them to face the complex working environment and to fulfill the high expectation of their future employers who want them to be more flexible, innovative and creative. However, the implementation of heutagogical approach specifically for SWDs in higher education is still lacking as most of the heutagogical issues discussed on its general implementation to all students. Thus, it is vital to implement heutagogy approach that includes all students without neglecting the SWDs and this approach could be referred as 'heutagogic-inclusive' approach.

Technology is one of the important elements in heutagogy as agreed by Canţer (2012), Cochrane, Antonczak, Gordon, Sissons, and Withell (2012), Blaschke (2012b), Blaschke (2014) and Blaschke and Hase (2016). Technology advancement could also remove barriers in community so that

inclusive society could be established. Persons with disabilities (PWDs) for example will benefit a lot from the technology in living their daily lives. The roles of technology in creating inclusive environment particularly in education could not be denied because it can facilitate students with disabilities (SWDs) in sustaining their educational journey as highlighted by one of the prominent figures in inclusive education in Malaysia, Zalizan Jelas (Zalizan Jelas, personal communication, June 5, 2012). Thus, in order to establish a heutagogic-inclusive environment particularly in higher education, the utilization of technology should not be neglected.

The first part of this chapter will discuss the importance of heutagogy in education and followed by the roles of technology in education specifically for SWDs in higher education. The Model of Technology-Supported Learning for Special Educational Needs Learners (MoTSEL) and how MoTSEL could foster a heutagogic-inclusive atmosphere in Malaysian higher education will be discussed after that.

HEUTAGOGY: THE SELF-DETERMINED LEARNING

Heutagogy is not a green approach in education and training. Hase and Kenyon (2000) defined heutagogy as "the study of self-determination" and further explained that in heutagogical approach, the teacher provides resources and recognize the need to be flexible in learning but by negotiating learning, the learner designs the actual course that they take. Blaschke (2016) further explained that heutagogy giving opportunity for learners to decide what and how they will learn, or in other words the learners are in full- controlled of their "learning environment, content and process".

Heutagogy does not contradict with the concept of andragogy by Knowles (1970) who emphasized on the self-directed learning. Heutagogy is the extension of the andragogical approach and it stressed on the self-determined learning (Hase & Kenyon, 2000; Blaschke & Hase, 2016). Like andragogy, heutagogy does not deny the roles of teacher/educator instead, the roles of teacher/educator has changed from teaching to facilitating the learning process. Blaschke and Hase (2016) also replaced the term teacher/educator in heutagogy with 'learning leader'.

Blaschke (2012) further discussed the differences between andragogy and heutagogy by highlighting the principles of heutagogy including capability, self-reflection, metacognition, double-loop learning, and nonlinear learning. To illustrate the continuum process from pedagogy to heutagogy, Luckin et al. (2012) coined the term Pedagogy-Andragogy-Heutagogy Continuum (PAH Continuum) that could be a guideline for educators in implementing heutagogical approach in teaching and learning.

Blaschke (2016) also stressed on the roles of higher education institutions (HEIs) in supporting the implementation of heutagogical approach, so that it could be accepted and adapted by both learners and educators. The roles of HIEs should go beyond the provision of teaching and learning processes in which they should by working closely with industries to know what are the expectations towards their students in the new challenging complex environment (Blaschke, 2016).

Heutagogy and Technology

To prepare students in the complex life and workforce, the four main 21st century learning and innovation skills, which is also referring to 4Cs, should be inculcated as early as possible and these skills are: 1) critical thinking, 2) communication, 3) collaboration and creativity (P21 Framework Definitions, 2015). These are in line with the six main heutagogic design elements proposed by Blaschke and Hase (2016) including: 1) Explore, 2) Create, 3) Collaborate, 4) Connect, 5) Share and 6) Reflect. And as stressed by Blaschke and Hase (2016), these six elements could be utilized to support the lifelong learning using technology.

Canţer (2012) believed that technology plays important roles in heutagogy and added that the concept of e-heutagogy for e-learning which promotes the lifelong learning concept. Blaschke and Hase (2016) also portrayed how technological development such as Web 2.0 promotes heutagogy approach for lifelong learning. Web 2.0 supports heutagogical approach as it allows learners to be active participants in teaching and learning processes and determine their own learning route (Blaschke, 2012b).

Cochrane, Antonczak, Gordon, Sissons, and Withell (2012) and Blaschke (2014) added, social media is one of the technology tools could be utilized to produce a personal learning environment (PLE) and it support the implementation of heutagogical approach in education. Blaschke (2014) in her study also found the use of social media in heutagogy supports the meta-cognitive development of students which prepared them to be capable individuals in work setting. Blaschke (2014) further explained by combining technology with heutagogical approach, it enables students to 'create, connect and collaborate', which these elements are important to prepare them to be more flexible in facing the challenging world in working environment.

In acknowledging the vital roles of technology particularly in web-based learning and mobile learning in heutagogical approach, Narayan (2014) proposed a set of preliminary design principles that highlighted three important elements components: participation, productivity and personalization.

In addition, Open Educational Resources (OER), MOOCs and flipped classroom could also be utilized in fostering the self-determined learning environment because it provides free resources for students and educators to use and share knowledge and information in teaching and learning (Blaschke, 2016).

TECHNOLOGY AND STUDENTS WITH DISABILITIES (SWDS)

Technology cannot be separated from the education field in this so-called Information Age. Roslinda Alias (2016), Roslinda Alias, Nor Aziah Alias, Abu Bakar Ibrahim and Jamizan Jalaluddin (2013), Morra and Reynolds (2006) and Sloan, Stone and Stratford (2006) agreed that technology would reduce learning barriers and at the same time support the SWDs' needs especially in tertiary education. Additionally, the utilization of technology in teaching and learning enables the higher education to have more learners without worrying on limitation of space (Morra & Reynolds, 2006).

There are several types of technologies that emerged in the field of special

education which can be used to support the SWDs' inclusiveness and these technologies are known as assistive technology (AT). Assistive technology ranges from 'low-tech' for instance, the invention of wheelchair to 'high-tech' such as computer and other advanced software and hardware (Rose, Harbour, Johnston, Daley, & Abarbanell, 2006).

Morra and Reynolds (2006) and Sloan, Stone and Stratford (2006) also agreed that technology would reduce learning barriers and at the same time support the SEN learners' needs in tertiary education. In addition, the utilization of technology in teaching and learning enables the tertiary institutions to have more learners without worrying on limitation of space (Morra & Reynolds, 2006).

Roslinda Alias et al. (2013) proposed three solutions in creating a conducive environment which supports the idea of inclusive education in higher education. These are: 1) the utilization of tablets for SWDs in higher education, 2) the improvement of the higher education existing learning management system (LMS) and 3) the utilization of Web 2.0 in teaching and learning.

The latest development in technology for education is the emergence of massive open online courses (MOOCs). MOOCs promote democratization of education especially in HEIs as it provides mostly free courses for learners via web (Dillahunt, Wang, & Teasley, 2014).

In order to guide proper selection and utilization of technology in supporting SWDs and at the same time to ensure inclusive education environment could be materialized, frameworks and models were developed. One of the assistive technology frameworks developed is the SETT framework by Zabala (2005) in which it is more focused on the decision framework aimed at the selection of suitable assistive technologies for SWD in schools. In Malaysia, Kyun, Tat, M. Iqbal Saripan and Ahmad Fauzi Abbas (2007) proposed a model known as the flexi e-learning system for higher education. Flexi e-learning system, recommended that by improving the existing e-learning system in higher education via the integration of online audio and video streaming, an inclusive environment could be established.

And latest, the technological model known as the Model of Technology-

Supported Learning for Special Educational Needs Learners (MoTSEL) has been developed by Roslinda Alias (2016). MoTSEL could be regarded as a comprehensive framework or model of assistive technology or technology-supported learning in Malaysia that covers all aspects of SWDs' life including teaching and learning, SWDs-friendly facilities, SWDs-friendly higher education administration as well as relationship between SWDs with and their non-SWD friends in higher education (Roslinda Alias, Nor Aziah Alias, Johan Eddy Luaran, Rosilawati Sueb, & Mahadi Kamaludin, 2017). The main aim of MoTSEL is to create conducive teaching and learning environment for SWDs so that inclusive HEIs could be established.

MoTSEL has been developed through a rigorous process to serve the needs of the SWDs particularly in Malaysian higher education. It is based on the two needs assessments investigation conducted among the public and 66 SWDs from eight Malaysian HEIs. During the needs assessments investigation, challenges and needs of SWDs, particularly in HEIs was observed. Then, content analysis of the eight selected HEIs websites was conducted for the foundation of the model prototype. The model prototype was then validated by a heterogeneous group of 11 subject matter experts (SMEs) from overseas and locals via the Delphi Technique. The consensus among the SMEs was achieved at the Round Two of Delphi. This indicates that the Model of Technology Supported Learning for Special Educational Needs (SEN) Learners is feasible and accepted to be implemented in the Malaysian higher education.

After going through a systematic process, the MoTSEL came into the picture. As showed in Figure 1.0, MoTSEL comprises of six components i.e. 1) Academic Affairs, 2) Students Affairs, 3) Library, 4) University Administration, 5) Community, Industrial Networking and Alumni and 6) Special Department/Unit for SEN with the main goal, to establish inclusive environment in Malaysian HEIs via technological elements embedded in the model.

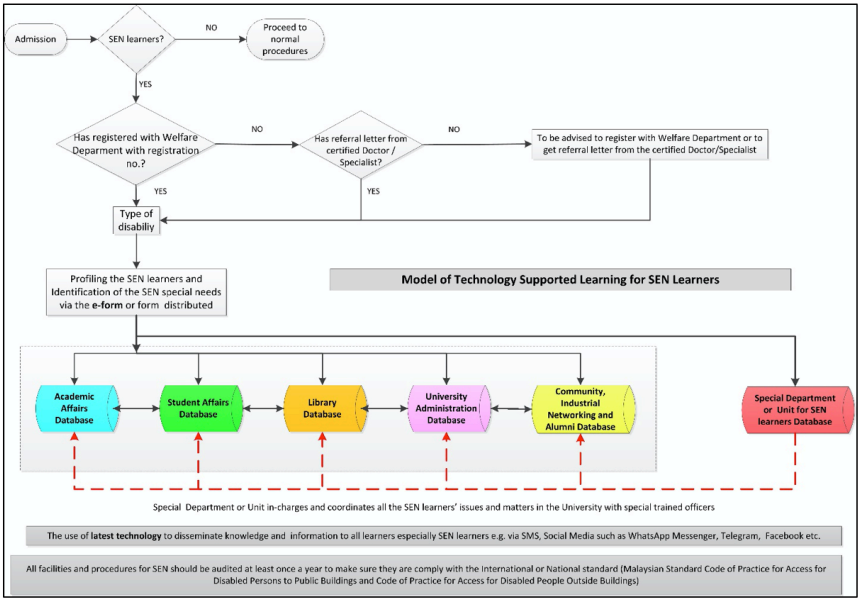

Figure 1: The Model of Technology Supported Learning for Special Educational Needs Learners (MoTSEL) in Malaysian HEIs

The next section, how MoTSEL could establish heutagogic-inclusive environment in Malaysian higher education will be discussed. For discussion, three MoTSEL sub-components that are closely related to heutagogical approach will be further discussed including Academic Affairs, Students Affairs and Library.

THE MODEL OF TECHNOLOGY-SUPPORTED LEARNING FOR SPECIAL EDUCATIONAL NEEDS LEARNERS (MOTSEL) AND HEUTAGOGIC-INCLUSIVE ENVIRONMENT IN MALAYSIAN HIGHER EDUCATION

Inclusion is 'a process of addressing and responding to the diversity of the needs of all learners through increasing participation in learning, cultures and communities, and reducing exclusion within and from education' (UNESCO, 2005, pg. 13). Inclusive education is giving equal opportunity

to all students in education 'regardless of their physical, intellectual, social, emotional, linguistic or other conditions' (UNESCO, 1994). Creating an inclusive environment for learning will accommodate the SWDs to learn along with their non-SWD friends and promoting lifelong learning journey.

The starting point of inclusive education in Malaysia began in 1990's with the special education movement as the main focus (Manisah Mohd Ali, Ramlee Mustapha, & Zalizan Mohd Jelas, 2006). And Malaysia is among the countries that consistently supports and upholds the inclusive education movement agenda (Roslinda Alias et al., 2013). Eligible special educational needs (SEN) learners or SWDs received equal chances in education starting from pre-school up to tertiary education as has been highlighted in the Malaysian Education Act 1996, Malaysian Persons with Disabilities Act 2008, and Malaysian Action Plan for Person with Disabilities 2016-2022 by Ministry of Women, Family and Community.

Roslinda Alias et al. (2013) emphasized that technology is one of the best solutions to ensure SWDs are included in HEIs and survived in their studies. Thus, MoTSEL, a technological-based model is developed to provide a framework for the implementation of inclusive education in Malaysian higher education (Roslinda Alias, 2016). MoTSEL has six technological-based sub-components that are 1) Academic Affairs, 2) Students Affairs, 3) Library, 4) University Administration, 5) Community, Industrial Networking and Alumni and 6) Special Department/Unit for SEN.

As highlighted earlier in this chapter, three sub-components will be discussed further to illustrate how MoTSEL could foster a heutagogic-inclusive environment particularly for SWDs in Malaysian higher education. This is to ensure that SWDs will be not excluded in the heutagogical approach agenda that is to produce competent and capable individuals who are ready to face the complex working atmosphere in the future via self-determined learning. To illustrate how MoTSEL could be utilized in creating heutagogic-inclusive environment, it's three sub-components namely Academic Affairs, Student Affairs and Library will be briefly discussed.

MoTSEL: Academic Affairs

The first important sub-component is known as Academic Affairs (as

illustrated in Figure 2.0) deals with the academic-related matters of SWDs, including the provision of technology-supported learning in classrooms and other learning spaces. In addition, automated notification to all academic units on the registered SWDs which is based on the university database will promote the heutagogic-inclusive environment in higher education.

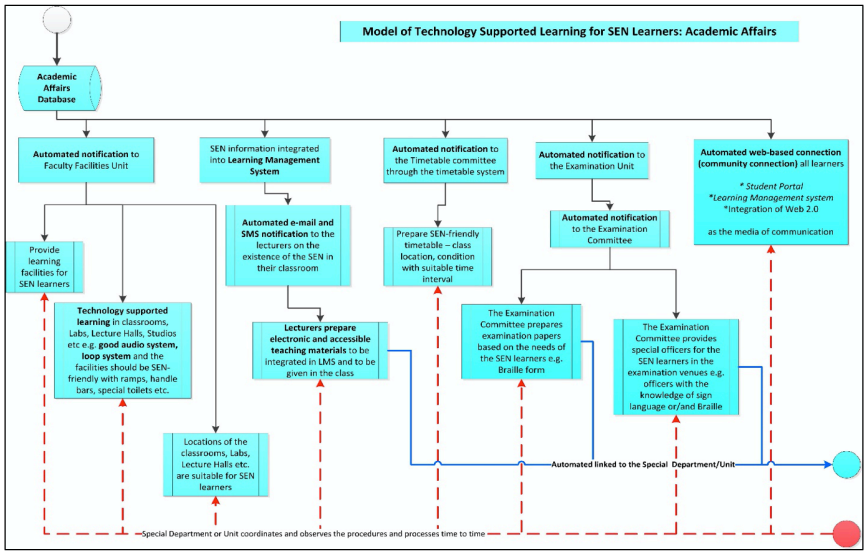

Figure 2: MoTSEL – Academic Affairs

MoTSEL: Student Affairs

The second MoTSEL sub-component is Student Affairs and as a technological model, the main element of Student Affairs element is automated notification on the registered SWDs to all units under Student Affairs department. This will ease SWDs' lives in campus, will support them in facing challenges and barriers and welcoming them inclusively. Student Affairs components as displayed in Figure 3.0 below.

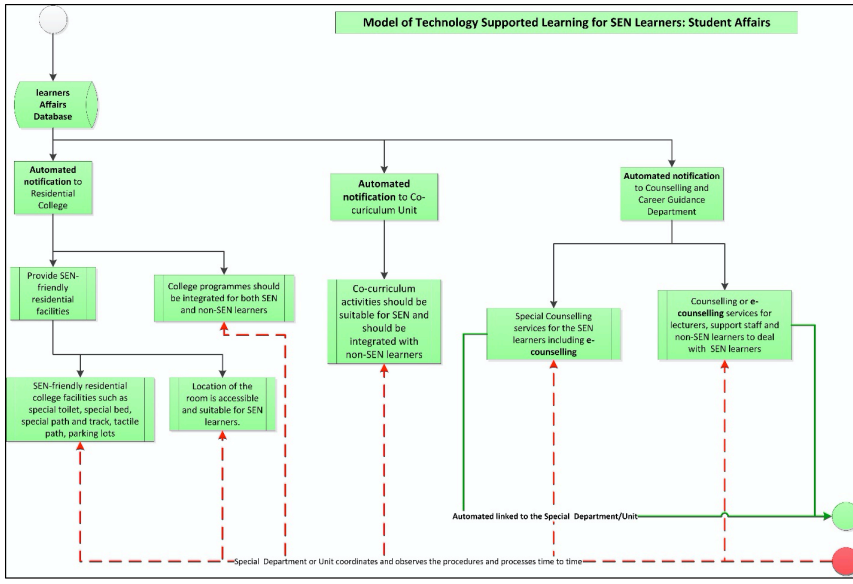

Figure 3: MoTSEL – Student Affairs

MoTSEL: Library

Library is the third sub-component of MoTSEL that plays important roles in promoting heutagogic-inclusive ambience in higher education and again, automated notification on the registered SWDs to all units under Library department is the core element. As shown in Figure 4.0, besides automated notification, the provision of special needs room, special services and facilities will foster and produce the self-determined SWDs in higher education.

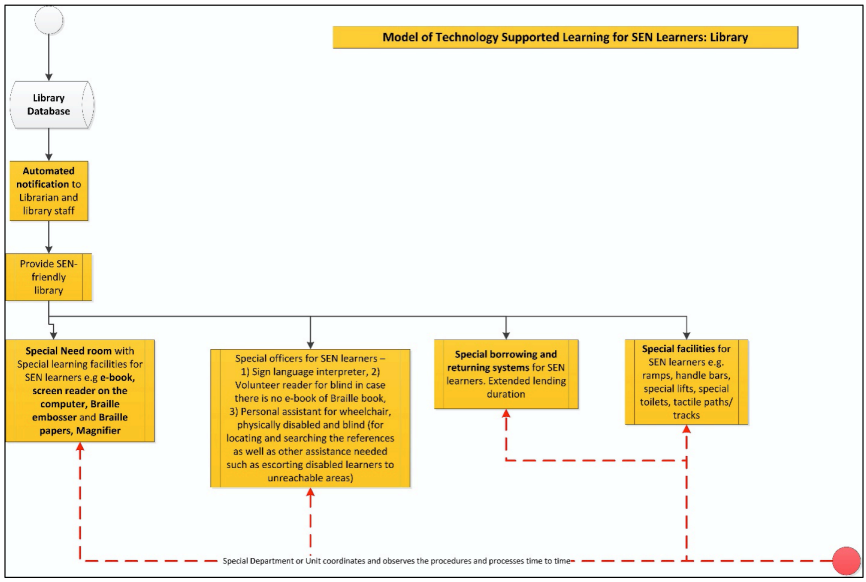

Figure 4: MoTSEL – Library

HOW WOULD MOTSEL CREATE A HEUTAGOGIC-INCLUSIVE ENVIRONMENT IN HIGHER EDUCATION?

Before we can implement a heutagogic-inclusive approach that will promote self-determined learning among SWDs in higher education, learning supports should be established. Support is one of the elements besides stability and connectedness in ensuring that students could succeed in their education and life (National Association of School Psychologists, 2010).

According to the Center for Medical Health in Schools (2002), learning supports refer to "resources, strategies and practices that provide physical, social, emotional and intellectual supports intended to enable all learners to have an equal opportunity for success at school" (p.1).
The provision of learning support for SWDs in higher education is vital because it can create a trouble-free transition in education. Trouble-free transition and educational aspirations are the two important elements that it will promote SWDs engagement in higher education (Adams and Holland, 2006).

Roslinda Alias (2016) concluded that there are four categories of learning support for SWDs that are: 1) physical supports, 2) intellectual supports, 3) social supports and 4) emotional supports. The establishment of effective learning supports will nurture the creation of heutagogic-inclusive environment as the SWDs is given opportunity to be equally treated in higher education.

The purpose of the MoTSEL is to provide a framework in providing learning supports for SWDs particularly in higher education via technology (Roslinda Alias, 2016). Referring to the main component in MoTSEL shown in Figure 1.0, the technology-supported learning for SWDs is given from the first day of registration until they graduated from their respective HEIs.

In addition, the technological-related components in the MoTSEL three sub-components (Academic Affairs, Students Affair and Library) would foster the implementation of the 4Cs of 21st century learning and innovation skills namely: 1) critical thinking, 2) communication, 3) collaboration and creativity on students particularly on SWDs.

In encouraging the adaption of the self-determined learning or heutagogy among students Blaschke and Hase (2016) proposed the six main heutagogic design elements to be considered which are: 1) Explore, 2) Create, 3) Collaborate, 4) Connect, 5) Share and 6) Reflect. These six elements could be used to support the lifelong learning using technology in higher education Blaschke and Hase (2016).

By combining the technological framework of MoTSEL and the six heutagogic design elements a heutagogic-inclusive environment could be established not only to cater for the needs of SWDs specifically, but it is will also benefit all students in HEIs.

CONCLUSION

Heutagogy and inclusion are not new unfamiliar terms in teaching and learning field nowadays. Both terms share the same objective that is to promote the lifelong learning, yet the focus of heutagogical approach is mainly for all students. SWDs needs a special support to help them enduring

their education journey particularly in higher education. Thus, recognizing the roles of technology in education, MoTSEL offers a technology-supported learning framework to foster inclusive environment in higher education. The provision of knowledge and skills in higher education are not enough as this will only produce competent students, however, with the advent of technology, the work setting has changed and becoming more complicated. Thus, HEIs should prepare capable students who could be more flexible, creative and innovative in dealing with the complex situation as requested by employers. This could be done through heutagogy i.e the self-determined learning approach. Merging MoTSEL and heutagogy approach could establish a heutagogic-inclusive environment that make HEIs more inclusive for everybody including SWDs.

REFERENCES

Adams, M., & Holland, S. (2006). Improving access to Higher Education for Disabled People. In M. Adams & S. Brown (Eds.), Towards Inclusive Learning in Higher Education: Developing Curricula for Disabled (1st Editio, pp. 10–22). New York: Routledge.

Blaschke, L. M. (2012b). Heutagogy and Lifelong Learning: A Review of Heutagogical Practice and Self-Determined Learning. The International Review of Research in Open and Distance Learning, 13(1), 56–71.

Blaschke, L. M. (2012a). Heutagogy and Lifelong Learning: A Review of Heutagogical Practice and Self-Determined Learning.

Blaschke, L. M. (2014). Using Social Media to Engage and Develop the Online Learner in Self-Determined Learning. Research in Learning Technology, 22(1). https://doi.org/10.3402/rlt.v22.21635

Blaschke, L. M. (2016). Strategies for Implementing Self - Determined Learning (Heutagogy) within Education : A Comparison of Three Institutions (Australia , South Africa, and Israel). Carl von Ossietzky Universität Oldenburg. https://doi.org/10.13140/RG.2.2.23074.63687

Blaschke, L. M., & Hase, S. (2016). Heutagogy: A Holistic Framework for

Creating Twenty-First-Century Self-determined Learners. In B. Gros, Kinshuk, & M. Maina (Eds.), The Future of Ubiquitous Learning: Learning Designs for Emerging Pedagogies (1st ed., pp. 25–40). Springer-Verlag Berlin Heidelberg. https://doi.org/10.1007/978-3-662-47724-3_2

Canţer, M. (2012). E-heutagogy for lifelong e-learning. Procedia Technology, 1, 129–131. https://doi.org/10.1016/j.protcy.2012.02.025

Center for Medical Health in Schools. (2002). What are Learning Supports? Retrieved from http://smhp.psych.ucla.edu/pdfdocs/whatlearningsupports.pdf

Cochrane, T., Antonczak, L., Gordon, A., Sissons, H., & Withell, A. (2012). Heutagogy and Mobile Social Media: Post Web 2.0 Pedagogy. In ascilite 2012: Future Challenges, Sustainable Futures (pp. 204–214). Wellington.

Dillahunt, T., Wang, Z., & Teasley, S. D. (2014). Democratizing Higher Education : Exploring MOOC Use Among Those Who Cannot Afford a Formal Education. International Review of Research in Open and Distance Learning. Special Issue: Research into Massive Open Online Courses, 5(Nov), 178–196.

Education Act 1996 (1996). Malaysia.

Hase, S., & Kenyon, C. (2000). From Andragogy to Heutagogy. Retrieved July 20, 2017, from http://pandora.nla.gov.au/nph-wb/20010220130000/http://ultibase.rmit.edu.au/Articles/dec00/hase2.htm

Hase, S., & Kenyon, C. (2003). Heutagogy and Developing Capable People and Capable Workplaces: Strategies for Dealing with Complexity. In Proceedings of the Changing Face of Work and Learning Conference. Alberta: University of Alberta. Retrieved from http://www.wln.ualberta.ca/events_con03_proc.htm

Hase, S., & Kenyon, C. (2007). Heutagogy: A Child of Complexity Theory. Complicity: An International Journal of Complexity and Education,

4(1), 111–118. Retrieved from www.complexityandeducation.ca
Knowles, M. S. (1970). The Modern Practice of Adult Education: Andragogy versus Pedagogy. New York: Associated Press.

Kyun, N. C., Tat, L. Y., M. Iqbal Saripan, & Ahmad Fauzi Abbas. (2007). EDUCATION FOR ALL : DISABLED FRIENDLY FLEXI E-LEARNING SYSTEM. In AEESEAP Regional Symposium on Engineering Education (pp. 120–124).

Luckin, R., Clark, W., Garnett, F., Whitworth, A., Akass, J., Cook, J., … Robertson, J. (2012). Learner Generated Context: A Framework to Support the Effective Use of Technology to Support Learning. In M. J. W. Lee & C. McLoughlin (Eds.), Web 2.0-Based E-Learning: Applying Social Informatics for Tertiary Teaching (1st Editio, pp. 70–83). Hershey , PA: IGI-Global.

Manisah Mohd Ali, Ramlee Mustapha, & Zalizan Mohd Jelas. (2006). An empirical study on teachers' perceptions towards inclusive education in Malaysia. International Journal of Special Education, 21(3), 36–44.

Ministry of Women Family and Community. (2016). Action Plan for Persons with Disabilities 2016-2022. Putrajaya: Ministry of Women Family and Community. Retrieved from https://www.kpwkm.gov.my/kpwkm/uploads/files/Dokumen/Dasar/PelanTindakan_OKU.pdf

Morra, T., & Reynolds, J. (2006). Universal Design for Learning: Application for Technology-Enhanced Learning. Inquiry, 15(1), 43–51. Retrieved from http://www.eric.ed.gov/PDFS/EJ881564.pdf
Narayan, V. (2014). Towards a Theoritical Mobile Heutagogy Framework. In Proceeding ascilite 2014 (pp. 150–160). Dunedin, New Zealand. Retrieved from http://ascilite.org/conferences/dunedin2014/files/fullpapers/138-Narayan.pdf

National Association of School Psychologists. (2010). Learning and Social – Emotional Supports for Students Experiencing Family Transitions : Meeting the Needs of Military, Foster, and Homeless Children. Bethesda: National Association of School Psychologists.

P21 Framework Definitions. (2015). Retrieved July 20, 2017, from www.p21.org

Persons with Disabilities Act 2008, Pub. L. No. Act 685 (2008). Malaysia.

Rose, D. H., Harbour, W. S., Johnston, C. S., Daley, S. G., & Abarbanell, L. (2006). Universal Design for Learning in Postsecondary Education : Reflections on Principles and their Application. Journal of Postsecondary Education and Disability, 19(2), 135–151.

Roslinda Alias. (2016). Development and Validation of A Model of Technology Supported Learning for Special Educational Needs Learners in Malaysian Institutions of Higher Learning. Universiti Teknologi MARA.

Roslinda Alias, Nor Aziah Alias, Abu Bakar Ibrahim, & Jamizan Jalaluddin. (2013). Proposed Technology Solutions for Special Educational Needs (SEN) Learners : Towards Inclusive Education in Malaysian Universities. International Journal of Information and Education Technology, 3(2), 206–210.

Roslinda Alias, Nor Aziah Alias, Johan Eddy Luaran, Rosilawati Sueb, & Mahadi Kamaludin. (2017). The Model of Technology-Supported Learning for Special Educational Needs Learners: Towards Inclusive Environment for Students With Disabilities (SWDs) in Malaysian Higher Education. In H. C. Alphin, R. Y. Chan, & J. Lavine (Eds.), The Future of Accessibility in International Higher Education (pp. 202–218). IGI-Global. https://doi.org/10.4018/978-1-5225-2560-8.ch012

Sloan, D., Stone, S., & Stratford, J. (2006). Creating Engaging, Accessible Multimedia for Learning. In M. Adams & S. Brown (Eds.), Towards Inclusive Learning in Higher Education: Developing Curricula for Disabled (1st Editio, pp. 129–142). New York: Routledge.

UNESCO. (1994). The Salamanca Statement and Framework for Action on Special Need Education. France: UNESCO. Retrieved from http://www.unesco.org/education/pdf/SALAMA_E.PDF

UNESCO. (2005). Guidelines for Inclusion: Ensuring Access to Education for All. France: UNESCO.

Zabala, J. S. (2005). Using the SETT Framework to Level the Learning Field for Students with Disabilities. Retrieved from http://www.joyzabala.com

The 21st Century Learning: Incorporating Heutagogical Approach And Digital Information Literacy

Azma Asnawi Abd Hakim, Husain Hashim, Shamila Mohamed Shuhidan, Shuhaida Mohamed Shuhidan

Abstract : The world of education has been revolutionary since the past three decades. Ranging from research on how people learn, to the studies on how teaching could and should be provided (Hase & Kenyon, 2013), education will continue to adapt to the growing needs of the societies. Over the years, it has been viewed from the pedagogical perspective of the relationship between the educator (teacher, lecturer and instructor) and the learner (student). It is always a linear and sequential process of learning in the way that the educator is in full control to decide on what the learner need to know, and certainly, how the knowledge and skills should be taught. Most recently, as dynamism and flexibility of the 21st century is connected to the emerging digital and social media era, and as immeasurable information flows directly to the fingertips of everyone, it gives a huge impact to teaching and learning, as well as to the growth of complex workplace needs. Hence, the 21st century learners need to acquire new skills, knowledge and methods of learning, aligned with living and working demands in a complex information environment (Kulhthau, 2010). This somehow indicates that learners should be imposed to information and digital literacy to help them enhancing their ability, in knowing how to learn, and to make them capable of continuing lifelong learning.

INTRODUCTION

One of the latest concepts in education is heutagogy, a learning approach that was intendedly introduced to cope with the fast-changing globalized world, wherein economy is immensely affected by information and knowledge, the critical resources of today. As opposed to pedagogical approach, through a heutagogical learning standpoint, learners place themselves at the center who are highly autonomous in designing the course learned, determined to negotiate learning and access learning resources on their own. They have the capacity to function proactively and allowed to explore from

self-chosen and self-directed action (Hase & Kenyon, 2000). In this regard, heutagogy gives emphasis to learning that is competency and capability related (Hase & Kenyon, 2001; Blaschke, 2012), thus emphasizing on the holistic development of the learner. It is an approach that promotes learners to reflect from their day-to-day unstructured experiences especially in applying their knowledge and skills in the familiar or unfamiliar situation (Blaschke, 2012), also in managing non-linear challenges (Phelps & Hase 2002; Phelps et al. 2005). Learners will involve in a deeper level of cognition to boost the capability in manipulating their own competency in terms of their self-efficacy, adaptability and ability to solve problems (Hase, 2011).

This is a phenomenon affecting the needs of the societies that is becoming incredibly complex where Halsall et al. (2016) contend the disciplined based knowledge, which is perceived as no longer appropriate in handling the complexity. Therefore, in schools and universities, the key issues of today are not only confined to what knowledge and skills must be taught and learned in the curriculum but also to recognize the proper learning approaches that is 'situation-sensitive' or 'condition-driven' in preparation of the new generations who will be responsible for making a nation remarkably competitive on the world map. Moreover, since learning is related to the information and knowledge seeking process as well as learners possess autonomous power over access to miscellaneous resources on the Internet including Web 2.0 platforms, the relationship between heautagogy and digital and information literacy can be viewed as they support each other in a complementary fashion. Thus, it becomes an interesting aspect to look into, which is the main focus underlined in the following discussion of this paper.

HEUTAGOGICAL APPROACH AND DESIGN PROCESS

The concept of heutagogy by Hase and Kenyon (2013), explained the study of self-determined learning, and challenges the ideas about teacher-centered learning. Hase (2014) identified a list of the principles of heutagogy, and one of the main focuses discussed in this paper is about the need for the learners to explore and deal with a lot of resources available. In this regard, Shamila Mohamed Shuhidan (2013) in her research on the internet usage of primary school children found that the experiences, knowledge, familiarity, motivation and proper guidance in literacy skills will help them to improve

their learning experiences. This is where the learners need to learn digital information literacy, even though they are capable of using computers and related technology efficiently, thus, it leaves the gap to be filled in the heatagogic design.

Blaschke and Hase (2015) have illustrated how the learner and educator or learning leader may design heutagogic experiences as shown in Figure 1, that explains a learner should explore, create, collaborate, connect, reflect and share with their friends, peers, educators, which may also involve the society. A learner will explore independently and select the most appropriate topic to be investigated. The process begins with the learning contract (Blaschke & Hase, 2015), where educators and learners identify the learning needs and what are the expected outcomes.

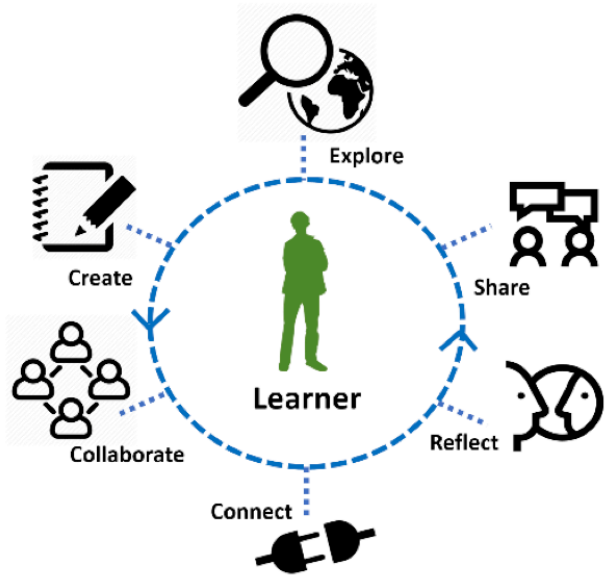

Figure 1: Heutagogic Design (Blaschke & Hase, 2015)

Furthermore, in order for the above heutagogic design to work effectively, it is also important to highlight Kuhlthau's proposal on a collaborative approach between educators and librarians (Kuhlthau, 2010). They are suggested to work as a team in guiding the learners appropriately in what is called a guided-inquiry process that facilitates 21st century learning. The

guidance provided is far from being teacher-centered when learners are still able to focus on constructing new knowledge through the steps of the inquiry process. It is to help them to acquire personal understanding and transferable skills, which Kuhlthau (2010) argued that without guidance, learners often will involve in copying and pasting with little real learning in preparing their assignments. Conversely, with guidance, they will be more pleasant in the constructive process of inquiry that gives the significant space for the educators and librarians to inspire the entire learning process.

Above all, although learners should be guided in their participation in an inquiry process (Kuhlthau, 2010), the real motivation needs to come from their self-awareness in realizing the importance of acquiring digital information literacy in such a way that they will be able to locate, assess and use digital information efficiently, effectively and ethically.

DIGITAL INFORMATION LITERACY

According to Alam and McLoughlin (2010), the concepts of digital citizenship and citizenship 2.0 are relevant to the knowledge economy and globalization context. Its definition is refined in line with the challenges faced in the preservation of digital information in today's citizen-created content environment as well as the nature of participatory and interconnected Web 2.0 platforms. In this context, learners are urged to become responsible global citizens.

Nonetheless, research by Soeters and Schaik (2006) found that the Internet had negatively exposed nearly 50% of children by experiencing online pornography and violence, and also computer viruses. This gives a reason for the educator to provide guidance and teaching on a range of information-seeking strategies, therefore the learner will be helped to obtain the information they need while avoiding inappropriate information. In doing so, Shamila (2013) pointed out that the educators should incorporate information skills, network or digital information literacy and technology to guide students when seeking information from the Internet for academic purposes.

Learning in heutagogy styles requires digital information literacy as to both learners and educators, this remains a challenge. Technological developments continuously introduce new and alternative ways on how we manage with information in order to survive in the knowledge era. Brown (2006) in his study identified some fundamental skills that are required in this new concept of learning styles: digital literacy skills, information skills, problem solving skills, visual media skills as well as psychological and emotional competence. For this paper, the authors focus on digital information literacy skills in heutagogy settings.

INCORPORATING HEUTAGOGIC APPROACH AND DIGITAL INFORMATION LITERACY

According to Calvani et al. (2010), there has been a consensus today on the need for digital competence to pay attention to a more complex and conceptual aspect than to purely focus on the technical dimension of technology. In this context, as 21st century learners are heutagogic learners who are high-skilled learners (Blaschke & Hase, 2015), they need to be flexible and responsive to new ideas and situations (Halsall et al., 2016). This should include the ability to comprehend the fundamental nature of technological phenomena, and also to know the implications of the utilization of web technologies, ethically and socially.

Correlated issues can be found in the literature over some shared concerns of heutagogy and digital information literacy, such as reflective thinking and metacognition, non-linear approach, and self-efficacy concerning learning and information seeking. These issues are surrounded by digital information literacy dimensions that show their influences on the relationship and the incorporated nature between heutagogy and digital information literacy. Calvani et al. (2009) proposed the three facets of digital literacy or digital competency comprising the cognitive, technology and ethical aspects. Learners are expected to apply these three main aspects: explore technological context in flexible ways, use their cognitive to access, select and evaluate information critically and, interact and share their knowledge constructively in a responsible (ethical) way.

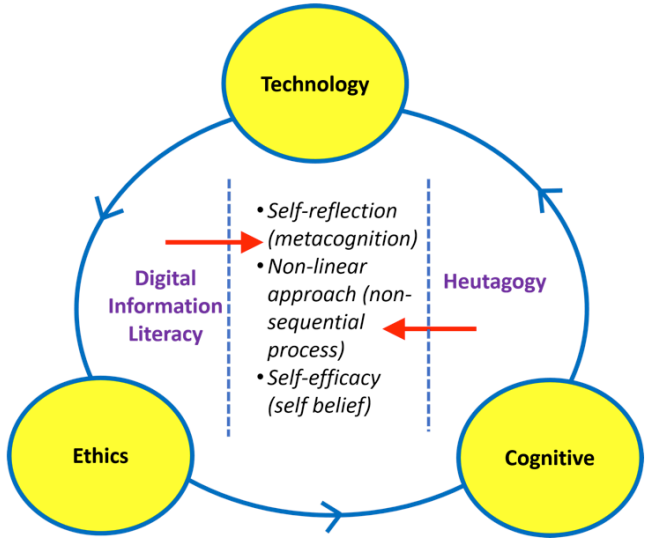

Figure 2: Incorporating Heutagogy and Digital Information Literacy (Adopted from Calvani et al., 2009)

Self-reflection and Metacognition

According to Blaschke and Hase (2015), learners and educators need to cooperate in a partnership. Despite learners are the center of the whole learning experience, their educators should guide and explain to them clearly about the learning process, so that they will be able to adapt the curriculum (Hase, 2014). While learners determine and negotiate what and how to learn, the role of educators would therefore be essential to create a more encouraging atmosphere for self-reflection and metacognition to surface in the entire learning processes involving questioning and answering tasks. In fact, both, educators and learners are the learning 'agents' need to be flexible and able to shift as learning occurs, and since learners control the entire process, they will be enabled to create new paths, new questions and new contexts (Blaschke & Hase, 2015). Educators are catalysts in providing learning guidance, such as by putting forward 'facilitative questions' (Russel, 2013) for online learnes who learn collaboratively with their 'community' members via active dialogs on the learning management system (LMS).

The facilitative questions are intended to delicately put a balance between 'presence' versus 'domination' that allow students to involve in an in-depth learning in order to gain deeper level of comprehension. In this respect, Russel (2013) suggested that some instructors give emphasis to a minimum number of postings, instead, they have expectations for quality that reflects a higher level of critical thinking on the learners' part. Additionally, in enabling learners to support their own ideas, they should be guided while expected to explore information by themselves including performing library research using scholarly or credible websites and databases that will contribute to their information literacy and heutagogical learning. It is done through a reflective way of learning and information seeking process, not that learners should simply agree on everything but to reflect on the new knowledge gained and to develop metacognition or understanding on how they have learned in which the whole experience should have shaped their value system and beliefs (Blaschke & Hase, 2015). Information literacy helps learners to foster reflective thinking in the sense that they would be able to understand conceptually the creation, dissemination and use of information (Wong, 2010). Moreover, since the information environment is more complex and overwhelming than before as a result of the Web advancements, the emphasis of information literacy should therefore shift to conceptual understanding and critical thinking.

Non-linear Approach

Hase et al. (2006) argued that pedagogical and andragogical methods are linear approaches to training and development, hence are inadequate in dealing with the recent complexity of learning. On the contrary, heutagogy supports learning that is non-linear, and unpredictable (Hase et al., 2006). Educators play a minimal part in the process of imparting knowledge and skills (competencies), but the learners as they position themselves at the center, are determined and capable in constructing their own learning and defining their own meaning based upon their previous experiences and inherent personal traits.

A similar condition occurs in most information literacy frameworks, which are commonly linear and are presented as a series of logical, rational and systematic steps. These frameworks are contended by Markless (2009)

insisting that the sequential view of skills deployment has been questioned for a long time as in reality, learners employ non-linear method as they rarely follow the prescribed sequence. Highlighting specifically on the influence of digital environment such as Web 2.0 which is described as "anarchic, disregarding hierarchy and order, and increasingly user constructed", the sequential (linear) approach to information literacy is rather more untenable (Markless, 2009). Blaschke and Hase (2015) underlined that learners more than ever should know "to check data with reputable sources, to analyze and synthesize information, to recognize a good argument, and to differentiate between correlational and causal relationships". For that reasons, via heutagogy, being highly skillful in learning, learners are prompted to react on their own knowledge and skill deficit and determined to find their own ways to fill the gap.

Self-efficacy

There is an interdependency in relation to the goals and issues of self-efficacy between heutagogy and digital information literacy. Through the self-efficacy principle of heutagogy, learners supposedly could afford to enjoy the autonomy by which they utilize the freedom and opportunity to formulate a lot of questions and find the answers by themselves (Hase, 2009; Abraham & Komattil, 2017). Nevertheless, what really matters is while answers are easy to find, the real difficulty faced by learners is they are not able to know the questions to ask as their creativity is somehow restricted due to the limitations provided by most education and management systems (Hase & Kenyon, 2001). This has arguably developed an uncertainty avoidance attitude among learners as affirmed by Gazi (2014) that people who possess it might have a hard time coping with ambiguity in the context of learning.

Likewise, according to Kurbanoglu et al. (2004), if ones feel self-confident about their information skills, they will be able to solve information problems in their hands. Self-efficacy belief affects learners' motivation through the effect on objectives (Bandura, 2001 as cited by Tuncer & Balci, 2013). The degree of their efforts in taking up a task is affected by the difficulty levels of the task. When faced by obstacles or failures, they might distrust their skills and therefore will either reduce their efforts or

dismiss the tasks altogether (Tuncer & Balci, 2013). Nevertheless, living in information-based societies, being confident and independent learners who are equipped with self-regulated learning and information skills are necessary for lifelong learning (Kurbanoglu et al., 2004).

HOW WEB 2.0, SOCIAL MEDIA AND ELECTRONIC PLATFORMS ENABLE HEUTAGOGY

Current research suggests the use of social media, which can facilitate self-determined learning. Learner and educator make use of the technology as a platform of enabling heutagogical approach. With its learner-centered design, technology through Web 2.0 applications allows learners to explore, discover information from various sources, engage their individual learning experience and also connect with others. Learners can create and share their personal collection and information through blogs, twitter, linkedln, MOOCs and Open Educational Resources. Blaschke, et al. (2010) claimed active use of social media for generating content by learners appears to support them in developing the skills of self-directedness.

Additionally, recognizing how learners seek for information in electronic environments is also necessary in order to design more proper information retrieval systems for students to use effectively (Shamila, 2013). A study by Madden et al., (2007) underlined that the use of electronic resources among learners are increasing to fulfil their information needs; hence, understanding this scenario would help in knowing their expectations toward information literacy. In this regard, Canning and Callan (2010) and Blaschke (2012) revealed the maturity level of learners has an effect on their learning activities. Learners who are more mature do not require much control of their educators as compared to less mature learners who need more guidance. In fact, the mature learners are more self-directed and demand for less structured courses.

CHALLENGES

Undoubtedly, the challenges faced by the world of education nowadays, have been long affected by a strong educational tradition relying on the educators' hand to be in control over teaching and learning activities. Nonetheless, the so-called borderless world and knowledge economy have affected the societies in the sense that, the urge and drive to change is crucial in order to create human capital especially in enhancing competitive edge. Discussed below are the challenges to be considered towards the enforcement of heautagogy pertinent to digital information literacy in support of teaching and learning process.

Ethics and Citizen 2.0 Competencies

Heutagogy acknowledges the world in which information is readily and easily accessible and the need to learn comes from the learner (Hase & Kenyon, 2001). However, asserted by Martin (2006) in a study on PISA, there were only 8% of the respondents (students) assumed to have high competence in using the Internet in an efficient way. Mostly, students seem to have computer competencies, but lacking in cognitive competencies in information seeking from the Internet (Shamila, 2013). Consequently, they were found to commit with the syndrome of plagiarism, copy, cut and paste in performing academic tasks (Shamila, 2013). Hence, an awareness of the validity and reliability of online information should be instilled in the learners for example the legal and ethical principles of information seeking. Alam and McLoughlin (2010) argued that the courses offered at the universities should be more responsible in facilitating citizen 2.0 competencies. With that respect, in becoming participatory and responsible global citizens or justice oriented citizens, the learners need to be exposed to higher order skills including critical thinking with the synthesis and evaluation capabilities.

6.2 Empowerment and Resistance to Change

Supposedly, when heutagogic learners have been empowered for self-determined learning, the educators should still play the guidance role as

they have the moral and ethical obligations, to model use of digital media and information such as on Web 2.0 platforms in a socially responsible way (Alam & McLoughlin, 2010). However, Murphy (1989) is cited by Gazi (2014) in highlighting a high-power distance culture of the distance learners in Turkey who struggled to learn independently as they were too used to the traditional teacher-centered form of high school education. Gazi (2014) ascertained that people feel more comfortable following an authority in which educators are in full control of a learning environment. Meanwhile, when the role of teachers/educators gets limited by empowering learners, they will feel insecure and will fear losing authority. Blaschke (2012) highlights similar issue of academic resistance to change and a "fear of relinquishing power" as among the reasons for heutagogy to receive limited attention from higher education and researchers.

These are the challenges that are in need for quick solutions if the learners would be able to perform effectively in the real world. Additionally, language barriers for learners in the information seeking process from the Web is also a significant issue, including for Malaysians. Mostly, the websites use the English language as the main medium for information sharing, which might not be understood by some learners in Malaysia. Other challenges are related to the adoption of new technology (Shamila, 2013; Blaschke, 2016). Some of learners and educators are not technology literate who resist to change and also have limited access to technology, especially for the communities in the rural areas. This will put some hindrance to the heutagogical approach and requires the educational institutions and respective authoritative bodies to take the necessary steps to address and overcome the discussed challenges and issues.

RECOMMENDATION AND CONCLUSION

The 21st century learning requires the learners to acquire new skills and knowledge in dealing with complex information to be aligned with the emergence of digital world. Learners need to be self-determined in knowing how to learn and work with others, a fundamental skill useful for their future. This has caused interest in heutagogy continues to rise, and new areas for research and development have emerged in conformity

to changes in teaching and learning of the 21st century. Literature reveals that the theories about heutagogy remain the interest of today (Blaschke, 2016). Being prospective in nature (Hallsall et al., 2016), heutagogical approach has been implemented in different educational settings (Blaschke et al., 2014). The learners, educators and educational institutions are allowed to seek for better ways, particularly through the act of exploring, creating, collaborating, connecting, reflecting and sharing to cope with the dynamically accessible and overwhelming learning resources via diverse means of delivery including Internet and social media.

Meanwhile, digital information literacy is one of many 'new literacies', intendedly imposed to people in order to close the information gap in support of learning activities. Therefore, the need to incorporate digital information literacy and heutagogical approach seems considerably justified especially as learners are empowered to design and control learning by themselves. In this respect, a learning contract should be mutually agreed upon between both parties, in a way that the educators become the catalysts in providing proper guidance and to set appropriate strategies in enabling the approach to be fully advantageous for the learners' sake. Educators are expected to promote ongoing reflection and state clearly the identification of tasks at the beginning of a learning session.

As shown in Figure 3, an incorporated model is recommended to integrate three main domains: 1) Knowledge, Skills and Character/Attitude (Baartman et al., 2011); 2) Digital competencies: Cognitive, Technology and Ethics (Calvani et al., 2009), and; 3) Heutagogical approach: Explore, Create, Collaborate, Connect, Reflect and Share (Blaschke & Hase, 2015). This proposed model is aimed to fully support the 21st century learning goals of the learners as they should be determined in knowing the followings: Know What (use their cognitive skills), Know How (use their technology skills) and Know Why (use their attitude/character in responsible ways).

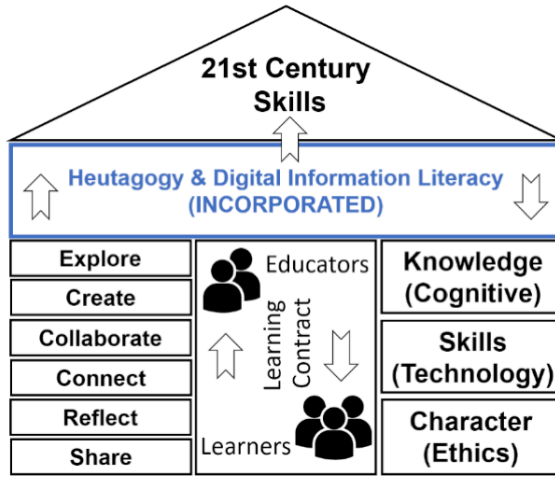

Figure 3: Proposed incorporated Model of Heutagogy and Digital Information Literacy

At the end of a learning session, learners should be able to relate the learned information and knowledge to the preexisting experience, as well as to their feelings, values, and perceptions, then, having them continually reevaluate their experience accordingly against the newly acquired information (Boud et al., 1985; Kuhlthau, 2008; Shamila, 2013). At the same time, when approached holistically, heutagogy can serve as an educational framework that can be applied across a learning institution, thus creating an environment characterized by a growth mindset and deeper levels of learning in both learners and educators.

The educators play an important role to guide the learners before they can learn independently. Heutagogic learners should apply their cognitive skills to demonstrate their declarative knowledge in order to know what types of information that they need and know how knowledge occurs through the procedural knowledge. While using the social media or other technological tools as learning enablers, they should know how to operate it well, ethically and responsibly. As a result, it is hoped that learners are able to know why knowledge occurs and have the capability to create meanings from the information that they found based on the principles and theoretical knowledge that they have acquired through learning.

REFERENCES

Abraham, R. R. & Komattil, R. (2017). Heutagogic approach to developing capable learners. Medical Teacher, 39(3), 295-299. Retrieved from https://info.vtc.vt.edu/teach/wpcontent/uploads/2015/10/Heutagogic.pdf.

Alam, S. L. & McLoughlin, C. (2010). Using digital tools to connect learners: Present and future scenarios for citizenship 2.0. In Proceedings of ASCILITE - Australian Society for Computers in

Baartman, L. K. J., & Bruijn, E. De. (2011). Integrating knowledge , skills and attitudes : Conceptualising learning processes towards vocational competence. Educational Research Review, 6(2), 125–134. Retrieved from: http://repo.uum.edu.my/15943/1/P14.pdf

Bandura, A. (2001). Social cognitive theory: an angetic perspective. Annual Review of Psychology, 54(1), 1–26. Retrieved from http://dx.doi.org/10.1146/annurev.psych.52.1.1.

Barnett, R. (2014). Conditions of flexibility: securing a more responsive higher education system. York: HEA.

Bhoyrub, J., Hurley, J., Neilson, G.R., Ramsay, M. & Smith, M. (2010). Heutagogy: an alternative practice based learning approach. Nurse EducPract. 19:322–326.

Blaschke, L. M. (2012). Heutagogy and lifelong learning: a review of heutagogical practice and self-determined learning. International Review of Research in Open and Distance Learning, 13 (1), 56–71. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1076/2113.

Blaschke, L. M., & Hase, S. (2015). Heutagogy: a holistic framework for creating twenty-first-century self-determined learners. In The Future of Ubiquitous Learning (pp. 25-40). Springer Berlin Heidelberg.

Blaschke, L. M. (2016). Strategies for implementing self-determined

learning (heutagogy) within education: a comparison of three institutions (Australia, South Africa, and Israel). (Master's Thesis), University of Oldenburg, Germany.

Boud, D., Keogh, R. & Walker, D. (1985). Reflection: turning experience into learning. London: Kogan Page, 7-17.

Brown, A. D. (2006). A Narrative Approach to Collective Identities. Wiley Online Library, 43 (4). Retrieved from: https://onlinelibrary.wiley.com/doi/10.1111/j.1467-6486.2006.00609.x

Calvani, A., Cartelli, A., Fini, A., & Ranieri, M. (2009). Models and instruments for assessing digital competence at school. Journal of e-Learning and Knowledge Society-English Version 4.3.

Calvani, A., Fini, A. & Ranieri, M. (2010). Digital competence in K-12. Theoretical models, assessment tools and empirical research. Analisi 40, 157-171.

Canning, N & Callan, S. (2010). Heutagogy: Spirals of reflection to empower learners in higher education.Reflective Practice, 11(1) pp. 71–82.

Chapnick, S. & Meloy, J. (2005). Renaissance eLearning: creating dramatic and unconventional learning experiences. Essential resources for training and HR professionals. San Francisco: Pfeiffer.

Coates, H. (2005). The value of student engagement for higher education quality assurance. Quality in Higher Education, 11(1), 25-36.

Devi, V., Ramnarayan, K., Abraham, R.R., Pallath, V., Kamath, A. & Kodidela, S. (2015). Short-term outcomes of a program developed to inculcate research essentials in undergraduate medical students. J Postgrad Med. 61:163–168.

Gazi, Y. (2014). Issues Surrounding a heutagogical approach in global engineering education. Paper presented at 2014 ASEE Annual Conference & Exposition, Indianapolis, Indiana. Retrieved from https://peer.asee.org/20722.

Halsall, J., Powell, J. L., Snowden, M. & Serpa, S. (2016). Determined learning approach: implications of heutagogy society based learning. Cogent Social Sciences, 2 (1). Retrieved from http://www.tandfonline.com/doi/full/10.1080/23311886.2016.1223904.

Hase, S. (2014). An introduction to self-determined learning (heutagogy) in L. M Blaschke, C. Kenyon & S. Hase, S. (eds.) Experiences in self-determined learning, Amazon, 1-19.

Hase S. (2011). Learner defined curriculum: heutagogy and action learning in vocational training, Southern Institute of Technology Journal of Applied Research, Special Edition on Action Research [Internet]. Retrieved from: http://sitjar.sit.ac.nz/ Publications/SITJAR%20AR%20edition%20A.pdf.

Hase, S. & Kenyon, C. (2013). Self-determined learning: heutagogy in action. London, UK: Bloomsbury Academic.

Hase S. & Kenyon, C. (2007). Heutagogy: a child of complexity theory. Complicity. 4, 111–118.

Hase, S. & Kenyon, C. (2001) Moving from andragogy to heutagogy: implications for VET. Proceedings of Research to Reality: Putting VET Research to Work: Australian Vocational Education and Training Research Association (AVETRA), Adelaide, SA, AVETRA, Crows Nest, NSW (28-30 March). Retrieved from http://epubs.scu.edu.au/cgi/viewcontent.cgi?article=1147&context=gcm_pubs.

Hase, S., Tay, B. H. & Goh, E. (2006). Developing learner capability through action research: from pedagogy to heutagogy in the workplace. Paper presented to Global VET: Challenges at the Global, National and local levels: Australian Vocational Education and Training Research Association (AVETRA) Conference, Wollongong, NSW (19-21 April). Retrieved from http://ziveuniverzity.sk/wpcontent/uploads/2015/11/Hase-Tay-Developing-learner-capability-through-action.pdf.

Hase, S. (2009). Heutagogy and e-learning in the workplace: some challenges and opportunities. Impact: Journal of Applied Research

in Workplace E-learning, 1(1), 43-52. Retrieved from DOI: 10.5043/impact.13.

Hase, S. & Kenyon, C. (2000). From andragogy to heutagogy. Retrieved March 27, 2015, from:
http://www.psy.gla.ac.uk/~steve/pr/Heutagogy.html.

Jacko, J., Emery, V., Edwards, P., Ashok, M., Barnard, L., Kongnakorn, T., Moloney, K. &

Kuhlthau, C. C. (1993). A principle of uncertainty for information seeking. Journal of Documentation, 49(4), 339-355.

Kuhlthau, C. C., Maniotes L. K. & Caspari A. K. (2007). Guided Inquiry: Learning in the 21st Century. 1st Ed. Westport, CT: Libraries Unlimited, Inc. 170 p.

Kuhlthau, C. C., Heinstrom J. & Todd R. J. (2008). The information search process revisited: Is the model still useful? Inform Res 13:355.

Kuhlthau, C. C. (2010). Guided inquiry: school libraries in the 21st century. School Libraries Worldwide. 16(1), 17-28.

Kurbanoglu, S., Serap, Akkoyunlu, Buket & Umay, Aysun. (2006). Developing the information literacy selfefficacy scale. Journal of Documentation, 62(6), 730-743. Retrieved from https://doi.org/10.1108/00220410610714949

Learning in Tertiary Education Annual Conference 2010. Australasian Society for Computers in Learning in Tertiary Education, 13-24.

Madden, A.D., Ford, N.J., & Miller, D. (2007) Information resources used by children at an English secondary school. Perceived and actual levels of usefulness. Journal of Documentation, 63(3), 40-358.

Markless, S. (2009). A new conception of information literacy for the digital learning environment in higher education. Nordic Journal of Information Literacy in Higher Education 1(1), 25-40. Retrieved from https://noril.

uib.no/article/viewFile/17/3.

Martin, A. J. (2006). Academic Resilience and Its Psychological And Educational Correlates: A Construct Validity Approach. Wiley Online Library, 43 (3). Retrieved from: https://onlinelibrary.wiley.com/doi/abs/10.1002/pits.20149

McLoughlin, C., Lee, M.J.W. (2007). Social software and participatory learning: pedagogical choices with technology affordances in the Web 2.0 era, ASCILLITE, Singapore [Internet]. Available from: http://www.ascilite.org.au/conferences/singapore07/procs/mcloughlin.

Murphy, K.L. (1989). A study of motivation in Turkish distance education. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA (1989, March).

Nesset, V. (2009). The information-seeking behavior of grade-three students in the context of a class project. Unpublished Dissertation, McGill University, Montreal, Quebec, Canada.

Phelps, R., Hase, S. & Ellis, A. (2005). 'Competency, capability, complexity and computers: exploring a new model for conceptualizing end-user computer education. BJET. 36:67–84.

Phelps, R. & Hase, S. (2002). Complexity and action research: exploring the theoretical and methodological connection. Educ Action Res. 10:507–524.

Rowlands, I., Nicholas, D., Williams, P., Huntington, P., Fieldhouse, M., Gunter, B., Withey, R., Jamali, H. R., Dobrowolski, T., & Tenopir, C. (2008). The Google generation: the information behaviour of the researcher in the future. Aslib Proceedings, 60(4) 290-310. Retrieved from http://www.emeraldinsight.com/journals.htm?articleid=1733495&show=pdf.

Russell, M. (2013). Beyond I agree: the instructor's role in facilitating critical thinking in online courses. The International Journal of Technologies in Learning. 19(1)

Sainfort, F. (2004). The effects of multimodal feedback on older adults' task performance given varying levels of computer experience. Behavior and Information Technology. 23(4), 247-264.

Shenton, A. K., & Hay-Gibson, N. V. (2011). Information behaviour and information literacy: The ultimate in transdisciplinary phenomena? Journal of Librarianship and Information Science, 43(3) 166-175.

Shamila Mohamed Shuhidan (2013). Information seeking processes among primary school children in Australia and Malaysia. (Doctor of Philosophy), RMIT University, Australia.

Shuhidan, S. M., MacAuley, P., & Reynolds, S. (2010). Using the Internet for academic purposes: Challenges for primary school children in Malaysia. In IADIS International Conference ICT, Society and Human Beings 2010, Part of the IADIS Multi Conference on Computer Science and Information Systems, MCCSIS 2010.

Shuhidan, S. M., Shuhidan, S. M., Bakar, S. A. A., & Hakim, A. A. A. (2016). Digital Competency Standard at Schools. International Information Institute (Tokyo). Information, 19(7B), 29-37.

Soeters, K.E. & Schaik, K. V. (2006). Children's experiences on the internet. New Library World, 107(1220/1221), 31-36.

Tuncer, M. & Balci, K. (2013). The research of the effect of computer and information literacy selfefficacy on the achievement of information literacy. Journal of Studies in Education, 3(4). Retrieved from https://doi.org/10.5296/jse.v3i4.4212.

Wong, K.W. (2010). Facilitating students' intellectual growth in information literacy teaching. Reference & User Services Quarterly. 50 (2), 114-118.