Gap Refinement of Teaching and Learning Practice in Digital Era Via Informal Guidance

Revathi Sagadavan, Shiney John

Abstract: Digitalization era leads to short concentration span and memoryless learners, as the whole world is in their hand in the form of gadgets and the internet. In such a situation, mismatching of coaching style of an educator and learning preferences of a student can lead to an ineffective learning experience. This paper is an attempt to explain the shift in learning preferences of the current younger generation. Educators need to acknowledge this issue to ensure the effective teaching and learning experience achieved and the gap between students and instructor refined. To achieve this objective, the Index of Learning Styles (ILS) questionnaire is adapted with addition of a few questions to understand the students learning preferences. The data were collected from a sample of 1089 respondents from Malaysia, China and Indonesia. The results reveal that majority of the students are in the visual category and they prefer informal guidance through social media channels.

Index Terms— Digitalization, learning preferences, visual learners, social media, accountability.

I. INTRODUCTION

Teaching and learning is a two-way communication. This communication is efficient only if the receiver (student) is able to relate their learning experience with real life activities [4]. With the presence of digitalization as smart phones and internet, students are becoming memoryless learners with short concentration span. The whole world is in their fingertips not as their memory but as memory card in the smartphone. This becomes the biggest challenge for educators to cater student's need, in terms of learning process. Mismatching between students learning preferences and educators teaching styles will lead to higher dissatisfaction and attrition level among the students [10]. In the past, numerous learning prototypes has been proposed to understand student's likings in terms of learning. To suit requirements of learners and also to elude "one size –fits all" teaching methodology many learning models has been suggested [9], [19], [21]. Kolb's Learning Styles Inventory [19], Myers- Briggs Type Indicator [23], VARK model [11] and Index of Learning Style (ILS) [8], [9], [10] are some of the few. A recent claim also emphasizes paradigm change in students learning preferences. To research this objective, Index of Learning Style (ILS) [8] is adopted with inclusion of

demographical questions. ILS is a promising instrument and has been used in recent researches [1], [2], [3], [18]. The validity and reliability of this instrument is very promising despite the sample size according to [3], [18].

Data from three different Asian countries (Malaysia, China, Indonesia) has been collected and analyzed. Higher Secondary and tertiary students participated in this research. This paper is a proof that the learning preferences in terms of information digestion among students does not change; the change is on how students want to receive the information or guidance. It is believed that the findings of this paper will be an eye opener for those claiming that students learning preferences changed and digital natives are independent learners.

II. LITERATURE REVIEW

The favorite techniques chosen by a student to learn in the course of his or her study is commonly referred as leaning styles. Students typically show their strength in one particular learning style, but they will also display numerous other learning style or a mixture of learning style according to their age, gender, character, culture and situations. Diverse features of different learning style have caused many researchers to study on different features of the learning styles and this has caused to the development of many learning style theories. Identification of learning styles gives details on approaches students use to focus on their studies, and the techniques they employ in acquiring knowledge, skills and information processing [17]. [7] defines learning style as a set of individual traits which are physical and developmental in nature that causes similar teaching successful for some group of learners and unsuccessful for another group. Learning style can also be defined as the right approach or skill a student desires to choose when studying [21]. Of the numerous learning style instruments available the most the most popular and commonly used ones are Kolb's Learning Styles Inventory (LSI), Neil Fleming's VARK Model, Felder- Silverman's Index of Learning styles (ILS) and Myers- Briggs Type Indicator (MBTI).

A. Kolb's Learning Styles Inventory (LSI)

One of the prominent educational theories used in higher education is Kolb's experiential learning theory [13]. The central idea that this theory emphasizes is that learning happens in a cycle and the learners will perform better when their learning experience follow every characteristic of this cycle [19]. For learning to happen, Kolb claims that a student must follow the following four stages

i) Concrete Experience—really do the experiment
ii) Reflective Observation—thinking about what has been done and then review and record the experiences
iii) Abstract Conceptualization—make a meaning observation on the hypothesis generated
iv) Planning Active Experimentation— examine the theory and suggestions to help in and preparing future experiences [31].

For successful learning to happen, the cycle should involve all the four stages.

B. Myers- Briggs Type Indicator (MBTI)

One of the most popular personality tools, MBTI model was based on the theories of psychologist Carl Jung. This model constitutes of four dimensions which can be used in the assessment of learning style based on Myer – Brigg questionnaire [23]. The following table represents a summary of the different dimensions based on MBTI indicators [18].

Table 1: Learning Style Dimensions of MBTI[18]

Dimensions	Learning style	Acronym
The attitude towards learning concern	Extraversion – Introversion	E-I
The perception process in learning	Sensing – Intuition	S-N
The judgement process in learning	Thinking – Feeling	T-F
The activity styles in the outer world are manifested through	Judgement – Perception	J-P

Four of the dimensions was combined to form the 16 learning styles, which was created on the proof that "each individual learning type perceives the outer world, makes judgment or is aimed at the inner world of thoughts and concepts or at outer world of people and things, and also the way he/she reacts to various situations" [30].

C. VARK learning style model

VAK model was improved by Neil Fleming [11] and formed the VARK model of student learning .This learning style categorizes learners by acknowledging the fact that students process information according to their "preference for visual learning (pictures, movies, diagrams), auditory learning (music, discussion, lectures), reading and writing (making lists, reading textbooks, taking notes), or kinesthetic learning (movement, experiments, hands-on activities).Categorizing students depending on their learning preference is necessary as it aids in examining the lesson's effectiveness according to various VARK learning mode.

[6] also states that even though students have their own learning preferences, teachers must take initiative to effectively implement these learning styles according to their students learning requirements. [24] has discussed the advantages of VARK model when implementing successful learning strategies.

D. Index of Learning Style (ILS)

This learning style assessment instrument was introduced by Felder and Silverman which was used to identify engineering students preferred learning style and was specially designed for class room use. The Index of Learning Styles (ILS) is a questionnaire which consists of 44 questions with a choice of 2 responses(a/b) for each question. This instrument categorizes learners into four dichotomous areas such as sensory or intuitive, visual or verbal, active or reflective, sequential or global [10].

Table 2 : Dimensions of ILS instrument [10]

Dimension	Classification	Definition
1	sensing	Concrete thinker, practical, oriented toward facts and procedures
	intuitive	Abstract thinker, innovative, oriented towards theories and underlying meaning.
2	visual	Visual representations, pictures, diagrams, flowcharts
	verbal	Written and spoken explanations.
3	active	Trying out things and enjoy working in groups.
	reflective	Thinking thing through and prefer to work alone or with one partner who is familiar.
4	sequential	Linear thinking process, learn in small incremental steps.
	global	Holistic thinking process and learn in large leaps.

When identifying preferred learning style of a learner ILS is the most popular instrument used today. The validity and the reliability of the instrument has been accepted in most of the researches done. Some works also have reported on the test-retest reliability and internal consistency [5], [14], [25], [32], [33]. Discussion about validity of the instrument can be found in researches done by [5], [25], [32], [33].

III. METHODOLOGY

This unit is an elaboration on methodology of this research paper. The discussion includes the instrument used, data collection process and samples that took part in this project.

A. Respondents

Digital natives aged between 17-25 years took part in this research activity. They are basically students from higher secondary schools or tertiary institutions from three different Asian countries which are Malaysia, China and Indonesia.

B. Data collection

Pilot study has been conducted in Malaysia only. 35 respondents from a private institution in Malaysia took part. This was a face to face process to understand the respondents' perspective. Then, the questionnaire was set up online and distributed to ease the data collection and data management process. The data collection was completed in 3 moths time.

C. Questionnaire

A well-known learning style questionnaire proposed by [8], is adopted in this research activity to define the learning preferences of the digital natives. This particular instrument consists of 44 questions with dichotomous option, where each 11 questions defines a particular dimension. In total there are 4 dimensions where each dimension consists of 2 responses. These scores are then calculated to categorize student's learning preferences. The explanation and calculation of the score can be found in [8], [18]. Together with the ILS questions 10 extra questions have been included in the instrument to understand the connection between learning preferences, attitude and demographics of respondents.

D. Analysis

The collected data was analyzed by using Statistical Package for Social Science (SPSS) version 24 for Windows 10. Several descriptive analyses such as frequency tabulation, cross tabulation, multiple response analysis and central tendency measures have been conducted.

IV. FINDINGS AND DISCUSSION

A total of 1089 valid responses received from three different Asian countries. Basic demographics such as gender, ethnicity, learning institutions of the respondents are summarized in the table 3.

Table 3: Demographics

Demographics	Classifications	Frequency	Percentage (%)
Gender	Male	484	44.4
	Female	605	55.6
Ethnicity	Malay	170	15.6
	Chinese	560	51.4
	Indian	174	16.0
	Others	185	17.0
Instituition	University	195	50.8
	College	86	22.4
	Secondary	103	26.8

The results revealed that more Chinese students has participated in this study. This is not surprising fact as both in Malaysia and China majority of the people are of Chinese origin. Also as the study was initiated in Malaysia, more

responses were from Malaysia. Next, this study is aimed to understand the digital natives' attitudes and behavior that can relate to the current situation. Initially, an investigation on the factors students perceive to have an important role on the career decision making was made. The information collected is discussed in table 4.

Table 4: Factors influencing career decision making

	Malaysia (%)	China (%)	Indonesia (%)
Institution	26.9	24.4	37.5
Teachers	25.5	14.4	38.5
Job market	26.6	40.7	8.7
Family	70.8	53.6	52.9
Own Choice	53.6	36.8	54.8
Friends	31.4	23.4	32.7
Media	14.4	5.7	7.7
Exhibition	17.0	16.3	6.7
Other	2.2	3.3	2.9

Table 4 indicates, for making a decision on their career path, most of the Asian students said that they were influenced by their family members. This may be because of the strong bond that exists among family members in an Asian culture. Studies have shown that children's career choices were influenced by their parent's careers, which means children tend to follow their parent's [15]. Some other factors that influenced career choices were parental pressure, cultural values and family responsibilities [26]. This study also pointed that the students were "strongly encouraged" even though they were not compelled to family opinion. Besides that, China students also keep job market requirement as one of the main criteria in choosing their career path. This indicates that China students are more matured and responsible about their future.

Findings in table 5, gives a description on how students prefer to get guidance from the instructor or teacher.

Table 5: Preferred guidance channel

	Malaysia	China	Indonesia
Class time	65.3	44.7	45.8
Outside class (office)	44.8	48.5	50.5
During break time	33.3	18.9	34.6
Via email	32.1	19.9	14.0
Social media	63.7	48.1	54.2

The study revealed, digital natives prefer informal education compared to formal one. This is clearly visible when the students choose social media as the most favored and email as the least choice besides getting guidance in the class time itself.

This results are supported by the literature [12], [16], [20], [29] which mentioned that many online social network sites, are used by tertiary students and instructors as a communication platform because the students are familiar with these sites and it can be used to enhance learning and facilitate academic discussion.

Table 6 is a summary on student's accountability on their learning process. They were given statements on 5 point likert scale to scale it from 1 (strongly disagree) to 5(strongly agree).

Table 6: Opinions on learning accountability

In my opinion,		Mean	Mode	Standard deviation
learning is my own responsibility	Malaysia	4.14	5	1.02
	China	4.41	4	0.98
	Indonesia	4.05	5	1.08
my instructor should motivate me in my learning	Malaysia	3.71	4	0.97
	China	3.68	4	0.92
	Indonesia	3.42	3	0.95
I should have high level of trust in my instructor	Malaysia	3.69	4	0.98
	China	3.61	4	0.94
	Indonesia	3.29	3	0.99
I can depend on my classmates / friends for more guidance	Malaysia	3.05	3	1.02
	China	2.98	3	1.21
	Indonesia	2.89	3	1.10

This table provides evidence that digital natives are taking accountability on their own learning process as all the central tendency measures are on the strongly agreement side. They also agree that instructor's motivation and trust have a great impact on their learning process. This is a contradicting information from the ones that we are used to hear which stated that digital natives are independent learners [28]. Results shows that they take accountability on own learning yet they crave for instructor's motivation. This is a sign where the role of instructor is still important for the learning process to be effective and efficient. Besides that, relying on friends is not on the preferred side and we conclude that current generation is not depending on their peers and is more self-centered to achieve their learning goal.

Table 7: Percentage of responses of different learning preferences

Dimension	Category	Malaysia	China	Indonesia
1	Activist	21.2	25.8	18.8
	Reflector	14.4	7.2	14.9
	Any	**64.4**	**67.0**	**66.3**
2	Intuitive	9.7	7.7	16.8
	Sensing	31.3	29.7	23.4
	Any	**59.0**	**62.6**	**59.8**
3	Verbal	3.2	9.1	16.5
	Visual	**58.0**	34.0	**46.8**
	Any	38.8	**56.9**	46.7
4	Global	8.9	11.5	14.9
	Sequential	24.7	19.6	18.8
	Any	**66.4**	**68.9**	**66.3**

Finally, to identify whether there is a paradigm change in learning preferences of digital natives compared to the earlier generation, ILS is adopted. The results in Table 7 says that, majority of the students falls under the category of no preference for dimension 1, 2 and 4. However, the situation is different when comes to dimension 3 which define the students either verbal or visual learners. Malaysian and Indonesian students fall under visual learners but for China students it is again no preference. Yet, the percentage for visual learners is still way high compared to verbal learners in China. Generally, we can conclude digital natives prefer visualization. This is similar to the literatures from year 1988 – 2015. Thus, the change in learning preferences for digital natives is just a myth.

V. CONCLUSION

In this study we presented the learning preferences of students from 3 different Asian countries who belong to the age group of 17-25 and categorized as digital natives. To tackle this research, we adopt Felder & Silverman ILS research instrument as recent researches define that the instrument is valid and reliable. In total 1089 responses from different education institutions across Malaysia, China and Indonesia were collected and used in this analysis. From the study we can conclude few things such as,

(i) The future orientation of most of the digital natives is based on their family advice. Also, China students sounds more responsible as the job market is also a criterion for them to design their future plan.

(ii) Digital natives take accountability on their own learning process. However, they also strongly believe that they need guidance and motivation from the instructor. In other words, the role of instructor is inevitable even for digital natives.

(iii) Digital natives prefer informal learning experience compared to formal one.

(iv) There is no change in students learning preferences as suggested by literature. They still belong to visual group.

In a nutshell, students learning preferences does not change over the decades but their preferences to get guidance from the instructor changed from formal to informal as they prefer social media as the most favored channel and email as the least. By knowing this truth, policy makers and educators can understand the students need better and serve them well.

REFERENCES

1. Akbulut, Y., & Cardak, C. S. (2012). Adaptive educational hypermedia accommodating learning styles: A content analysis of publications from 2000 to 2011. *Computers & Education*, *58*(2), 835-842.
2. Al-Azawei, A., & Badii, A. (2014). State of the art of learning styles-based adaptive educational hypermedia systems (LS-BAEHSs). *International Journal of Computer Science & Information Technology*, *6*(3), 1-19.
3. Al-Azawei, A., & Lundqvist, K. (2015). Which Factors Affect Learner Achievement? Analysing the Role of Psychological, Surface Level, Environmental and Learner Effort Variables. *International Journal of Education*, *7*(2), 215-231.
4. Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). *How learning works: Seven research-based principles for smart teaching*. John Wiley & Sons.
5. Cook, D. A., & Smith, A. J. (2006). Validity of index of learning styles scores: multitrait− multimethod comparison with three cognitive/learning style instruments. *Medical Education*, *40*(9), 900-907.
6. Drago, W. A., & Wagner, R. J. (2004). Vark preferred learning styles and online education. *Management Research News*, *27*(7), 1-13.
7. Dunn, R. (2000). Capitalizing on college students' learning styles: Theory, practice, and research. *Practical approaches to using learning styles in higher education*, 3-18.
8. Felder, R. M., & Brent, R. (2005). Understanding student differences. *Journal of engineering education*, *94*(1), 57-72.
9. Felder, R. M., & Silverman, L. K. (1988). Learning and teaching styles in engineering education. *Engineering education*, *78*(7), 674-681.
10. Felder, R. M., & Spurlin, J. (2005). Applications, reliability and validity of the index of learning styles. *International journal of engineering education*, *21*(1), 103-112.
11. Fleming, N., & Baume, D. (2006). Learning Styles Again: VARKing up the right tree!. *Educational developments*, *7*(4), 4.
12. Hamid, S., Waycott, J., Kurnia, S., & Chang, S. (2010, July). The Use of Online Social Networking for Higher Education from An Activity Theory Perspective. In *PACIS* (p. 135).
13. Healey, M., & Jenkins, A. (2000). Kolb's experiential learning theory and its application in geography in higher education. *Journal of geography*, *99*(5), 185-195.
14. Hosford, C. C., & Siders, W. A. (2010). Felder-Soloman's index of learning styles: Internal consistency, temporal stability, and factor structure. *Teaching and learning in medicine*, *22*(4), 298-303.
15. Howard, K. A., Ferrari, L., Nota, L., Solberg, V. S. H., & Soresi, S. (2009). The relation of cultural context and social relationships to career development in middle school. *Journal of Vocational Behavior*, *75*(2), 100-108.
16. Hughes J. E., "The rise of social media in online education: How is it changing curriculam?," 14 February 2011. [Online].
17. Jantan, R., & Razali, M. (2004). *Psikologi pendidikan: pendekatan kontemporari*. McGraw Hill.
18. Kaliská, L. (2012). Felder's learning style concept and its index of learning style questionnaire in the Slovak conditions. *Grant Journal*, *1*, 52-56.
19. Kolb, D. A. (2014). Experiential learning: Experience as the source of learning and development. FT press.
20. Kuppuswamy, S., & Narayan, P. S. (2010). The impact of social networking websites on the education of youth. *International journal of virtual communities and social networking (IJVCSN)*, *2*(1), 67-79.
21. Lebar, O., & Mansor, N. H. (2000). Pencapaian pelajar mengikut gaya belajar dan bentuk pentaksiran. In *education seminar Universiti Pendidikan Sultan Idris, Unpublished presented papers*.
22. Loh, C. Y. R., & Teo, T. C. (2017). Understanding Asian Students Learning Styles, Cultural Influence and Learning Strategies. *Journal of Education & Social Policy*, *7*(1), 194-210.
23. MYERS, I. B., BRIGGS, K. C. (2009). My MBTI Personality Type. [online]. [quoted 3.12.2018]. Available at: http://www.myersbriggs.org/
24. Othman, N., & Amiruddin, M. H. (2010). Different perspectives of learning styles from VARK model. *Procedia-Social and Behavioral Sciences*, *7*, 652-660.
25. Platsidou, M., & Metallidou, P. (2009). Validity and Reliability Issues of Two Learning Style Inventories in a Greek Sample: Kolb's Learning Style Inventory and Felder & Soloman's Index of Learning Styles. *International Journal of Teaching and Learning in Higher Education*, *20*(3), 324-335.
26. Polenova, E., Vedral, A., Brisson, L., & Zinn, L. (2018). Emerging Between Two Worlds: A Longitudinal Study of Career Identity of Students From Asian American Immigrant Families. *Emerging Adulthood*, *6*(1), 53-65.
27. Riding, R., & Cheema, I. (1991). Cognitive styles—an overview and integration. *Educational psychology*, *11*(3-4), 193-215.
28. Rothman, D. (2016). A Tsunami of learners called Generation Z. URL: http://www. mdle. net/Joumal FA_Tsunami_of_Learners_Called_Generation_Z. pdf.
29. Rutherford, C. (2010). Using online social media to support preservice student engagement. *MERLOT Journal of Online Learning and Teaching*, *6*(4), 703-711.
30. Salter, D. W., Evans, N. J., & Forney, D. S. (2006). A longitudinal study of learning style preferences on the Myers-Briggs type indicator and learning style inventory. *Journal of College Student Development*, *47*(2), 173-184.
31. Stice, J. E. (1987). Using Kolb's Learning Cycle to Improve Student Learning. *Engineering education*, *77*(5), 291-96.
32. Van Zwanenberg, N., Wilkinson, L. J., & Anderson, A. (2000). Felder and Silverman's Index of Learning Styles and Honey and Mumford's Learning Styles Questionnaire: how do they compare and do they predict academic performance? *Educational Psychology*, *20*(3), 365-380.
33. Zywno, M. S. (2003, June). A contribution to validation of score meaning for Felder-Soloman's index of learning styles. In *Proceedings of the 2003 American Society for Engineering Education annual conference & exposition* (Vol. 119, No. 1-5). Washington, DC: American Society for Engineering Education.