Affective Characteristics for 21st Century Learning Environments: Do They Matter?

https://doi.org/10.3991/ijim.v14i12.15567

Su Luan Wong
Universiti Putra Malaysia, Selangor, Malaysia
suluan@upm.edu.my

Abstract—Twenty-first century learners are media-centric and heavily reliant on technology. Internet-accessible resources are always at the students' fingertips and they learn through such resources anywhere, anytime. Unfortunately, formal education in most part of Asia remains largely examination focused given the immense pressure to obtain paper qualifications. Our challenge today is how do we make students learn on their own volition? How do we then sustain learning when the education system is still very much examination-centric? Success in learning is not always dependent on the ways students are taught in the classroom or the tools they use to learn but can be very much affected by the learners' affective characteristics. This paper highlights two selected affective characteristics— attitudes and interest, as previous and current literature continue to suggest their positive impact on student behavior including learning.

Keywords—Affective, attitudes, interest

1 Introduction

As we progress into a digital-based society in the 21st century, the role of education has remained the same—it empowers learners to become active and successful members of society [1]. Learners of the 21st century are expected to rise to the challenge of thriving in a competitive world. Students who memorise and regurgitate facts will find themselves left behind in the pursuit of knowledge while those who are able to use knowledge critically and analytically will excel in the workforce [2]. Rote learning is no longer the preferred way of learning [3]. Krishnan [2] stressed that the education systems have been slow to respond to the expectations and demands of today's world. Formal education in most part of Asia remains largely examination driven given the immense pressure to obtain paper qualifications. Our challenge today is how do we make students learn on their own volition? How do we then sustain learning when the education system is still very much examination-centric? Success in learning is not always dependent on the ways students are taught in the classroom or the tools they use to learn but can be very much affected by the learners' affective characteristics.

2 Learning Domain Trends in Education

There are three main learning domains in education—cognitive (knowledge), psychomotor (skills) and affective (emotions). When developing and delivering lessons, it is pertinent for teachers to encompass all three learning domains in the teaching process to create a well-rounded learning experience for learners with diverse learning styles [4]. However, according to McCoach, Gable and Madura [5], the cognitive domain received wide attention in the 1960s when Bloom [6] introduced his cognitive taxonomy for education while little was said about the affective domain. McCoach et al. [5] echoed Tyler's [7] view that awareness of the affective domain started to increase in the late 1960s and early 1970s among educators when they acknowledged its importance for developing learning outcomes. Prior to this, the affective domain was seen as too trivial to be measured given that such characteristics were more suitable to be nurtured outside the school [7]. In fact, teachers who used emotive and affective practices in the learning environment were labelled as "incompetent and incapable of maintaining order and discipline in their classrooms" [8, p.25].

In other words, the cognitive domain has continued to be given emphasis because obtaining good grades for every examination among students is seen as the ultimate goal. Understandably, standardised achievement tests is the norm in many Asian countries where students compete to gain admission to the best schools, colleges or universities through good grades. Chan et al. [9] warned that the negative implication of such learning context will lead to students not enjoying learning.

Interestingly, Miller [10] interpreted the works of Smith and Ragan [11] that there are elements of affective component in all cognitive and psychomotor objectives or learning outcomes. McCoach et al. [5] explained that the dynamic interaction between the cognitive and affective domain produces the cognitive and affective learning outcomes. Such affective learning outcomes play a role in guiding "future feelings about the course contents and issues (attitudes), feelings or personal worth and success (self esteem), desires to become involved in various activities (interests) and personal standards (values)" [5, p.4]. In other words, educators should attend to students' affective characteristics given the role they play in shaping students' future behaviour [12]. Given the aforesaid discussion, it appears that the affective domain has an important role to play in learning success. Indeed, success in learning is not always dependent on the way students are taught in the classroom or the tools they use to learn but can be very much affected by the learners' affective characteristics.

3 Characterising the Affective Domain

According to Anderson and Bourke [13], human characteristics encompass the ways one would think (cognitive), act (behaviour) and feel (affective) in various situations. They stressed that the human characteristic must involve the feelings and emotions of the person in order to be classified as affective.

In addition, all affective characteristics must meet the following three criteria— intensity, direction and target [13]. Table 1 captures the meaning and essence of the

aforementioned criteria as explained by Anderson and Bourke [13] in their book entitled Assessing Affective Characteristics in the Schools. Based on the information in Table 1, intensity shows to what extent a person's feeling towards a target while the direction of that feeling reflects one's positive or negative inclination.

It could be assumed that love and hate have the same intensity but are opposite feelings. This means that a person could either feel bad or good. Whilst, the target is associated to an object, activity or idea towards how one feels. A target can be known or unknown to the person having the feeling. For example, a student starts to feel nervous about the results of an important examination (known target) or feels nervous without any reason (unknown target). The feeling of nervousness without knowing why, could be due to some underlying reasons that the student cannot recall.

Table 1. Criteria of affective characteristics

	Criteria		
	Intensity	***Direction***	***Target***
Meaning	Degree/strength of feelings	Positive/negative orientation of feelings	Object/activity/idea towards feelings
Explanation	Extent of feelings vary	Either it is a good or bad feeling	Can be variations and be known or unknown
Example	Hate is a stronger emotion than dislike	Hate is a bad feeling; love is a good feeling Love is the opposite of hate	A person hates coffee (1 target) A person loves coffee and tea (2 targets) A person feels anxious in the morning for no reason (unknown target)

4 Types of Affective Characteristics: Attitudes and Interest

This paper highlights two relevant and important affective characteristics—attitudes and interest given both constructs' influence in shaping learners' behaviours in the 21st century. It is pertinent to understand such characteristics that shape learners' behavioural intention and behaviour so as to influence the learning design to optimise the learning outcome.

4.1 Attitudes

An attitude is defined as "a mental and neural state of readiness, organised through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" [14, p. 810]. According to Ajzen and Fishbein [15], a learner's attitudes could either be favourable or unfavourable towards an object (target). For example, when a learner's attitudes are favourable towards examinations, the person will feel calm sitting for examinations (positive response towards the target). When a learner is not favourable towards examinations, the person will feel anxious sitting for examinations (negative response towards the target). Attitudes is formed when an individual is exposed towards an object for a certain period of

time [16]. It would be reasonable to assume that users would possess either a positive or negative attitude through experience or upbringing [17]. Past studies have shown that attitudes can shape behavior [18, 19]. The Theory of Reason Action (TRA) by Fishbein and Ajzen [20] posits that behavioural intent is a crucial determinant of behaviour. The TRA also holds that the combined effects of attitudes toward performing the behaviour and subjective norm play a big role on an individual's intention to perform a behaviour. Table 2 shows evidence of several latest studies suggesting the influence of attitudes in shaping behavioural intention/behavioural. This means that attitudes is a strong predictor of learning behaviour.

Table 2. Attitudes-behavioural intention/behavioural studies

Main Findings	Sample and Location	Authors
Attitudes has a positive effect on intention to use mobile marketing services	115 bachelor students, Malaysia	Ismail, Che Razak, Yaacob, Zakaria, Amiruddin, & Luqman [21]
Attitudes towards use of m-learning, subjective norm, perceived usefulness and perceived ease of use explains 23% of the variances observed in students' intention to use m-learning. Attitudes has the most significant effect on behavioural intention	487 university students, Southern Ghana	Buabang-Andoh [22]
Attitudes towards use of mobile learning through Whatsapp has a positive influence on mobile learning adoption for learning	223 diploma and bachelor students, South Africa	Bere & Rambe [23]
Attitudes towards Whatsapp use for teaching-learning is significantly and positively related to intention to use Whatsapp for academic writing	120 university students, Botswana	Magogwe & Jaiyeoba [24]
Attitudes towards mobile social games positively influences behavioural intention to play mobile social games	491 wechat users, China	Chen, Rong, Ma, Qu & Xiong [25]
Attitudes towards mobile applications predicts actual use of mobile applications for learning	380 university students, South Africa	Chuchu & Ndoro [26]

4.2 Interest

Interest is another affective characteristic that has a powerful influence on learning. Getzels [27] defines interest as a "disposition organised through experience which impels an individual to seek out particular objects, activities, understandings, skills, or goals for attention or acquisition (p.98)". This means that interest can drive students to learn. In order for students to learn effectively and efficiently, they must possess some extent of interest in learning what they are expected to learn [13]. Learning is enjoyable and effective when students learn with interest [9]. Quite on the contrary, learning can be ineffective and inefficient when stimulated by coercion instead of being driven by interest [7].

Intrigued with the power of interest in learning, a group of Asian researchers came together collaboratively to deal with a common problem in Asian schools — the obsession with examination driven learning environments. They developed a theory which they called Interest-Driven Creator (IDC) after realising that they needed a theory to guide research and practice in the classrooms specifically for the Asian context [9].

IDC—a design theory constituting three anchored concepts which are interest, creation and habit. Each of these concepts comprises a loop consisting of three components (Figure 1). IDC posits that when classroom practice involves technology supported learning activities driven by IDC theory, students will develop interest in learning, be engaged in the creation process and develop habits of learning through the repetition of the aforesaid process in their daily routine [9].

Fig. 1. Three anchored concepts of IDC

According to Wong, Chan, Chen, King and Wong [28], interest — the first loop promotes learning by triggering interest to learn through students' curiosity and then immersing them in the learning activity where they are in the flow state. This is when students are completely engrossed in the learning activity. Students then extend their learning interest by making sense of what they have learnt.

Creation, the second loop emphasises on idea generation and artifacts construction for better learning outcomes [29]. The loop starts with students imitating from a learning model to form their background knowledge. Imitation lays the foundation for students to learn. They then combine the acquired background knowledge with existing knowledge and artifacts to create new ideas or knowledge. From here, students move on to staging where they are given opportunities to share or showcase their creations to elicit feedback from peers or teachers.

The last loop, habit starts with an environment cue (arrangement of place, time, people, or incidents) which functions as a trigger to the students about what is happening in the learning environment and their response [30]. The said response refers to the students' learning behaviour that ensues after the trigger. Behaviours that are repeated consistently and prompted by environmental cues are known as habits [31]. This means that students' learning behaviour when repeated constantly will progress into a routine until they achieve a sense of harmony. Chan et al. [9] explained that this is where students' efforts lead to a sense of accomplishment with a feeling of satisfaction and inner serenity.

Table 3 shows evidence of several studies suggesting the relationship between interest and student learning. Other studies also provide some evidence that interest has an impact on learning behaviour.

Table 3. Interest-learning studies

Main Findings	Sample and Location	Authors
Students' interest and their relationship with the instructor are contributing factors in successful academic performance	2 middle school students, USA* **qualitative study*	Saur [32]
Academic achievement and interest in learning are significantly correlated, academic achievement and attitude to school is significantly correlated, interest in learning and attitude to school is significantly correlated. Both students' attitudes to school and interest in learning significantly predict their academic achievement, accounting for as much as 21.6% of the variance in academic achievement	511 secondary school students, Nigeria	Kpolovie & Okoto [33]
Interest significantly affects students' m-learning concentration	92 college students, China	Li & Yang [34]
Interest and m-learning concentration are significantly correlated. Interaction between presentation mode (text, graphics & video) and interest has a significant effect on learning achievements	258 college education major students, China	Yang, Li & Lu [35]
Interest is significantly correlated to mathematics performance among students with lower mathematics proficiency	20 secondary school students, Malaysia	Wong & Wong [36]

5 Conclusion

This paper has attempted to highlight the relevance and importance of affective oriented education for 21st century learners. It is important to recognise that both attitudes and interest can differ in intensity and they can be learned. It is equally important to subscribe to the view that formal learning environments be involved in affective education given that attitudes and interest are predictive of and pertinent to human behaviours including academic achievements. Suffice to say, affective education is absolutely necessary for more favourable student learning outcomes in the 21st century learning environments.

6 Acknowledgement

This paper was presented as a keynote at the 3rd International Conference on Learning Innovation, Malang, Indonesia.

7 References

[1] Nichols J. R. (2017). 4 essential rules of 21st century learning. Retrieved https://www.teachthought.com/learning/4-essential-rules-of-21st-century-learning/

[2] Krishnan, K. R. (2013). Learning in the 21st century. Retrieved from https://www.todayonline.com/commentary/learning-21st-century
[3] Yen, N.L., Bakar, K.A., Roslan, S., Luan, W.S., Rahman, P.Z.M.A. (2005). Predictors of self-regulated learning in Malaysian smart schools. *International Education Journal*, 6(3), 343-353.
[4] London School of Economics (2019). The three (3) domains of learning – Cognitive; affective; and psychomotor (CAPS) – It's application in teaching and learning. Retrieved from https://lsme.ac.uk/blog/the-three-3-domains-of-learning
[5] McCoach, D., Gable, R., & Madura, J. (2013). Instrument development in the affective domain. New York, NY: Springer.
[6] Bloom, B.S. (Ed.). (1956). Taxonomy of educational objectives, handbook 1: Cognitive domain. New York: McKay.
[7] Tyler, R.W. (1973). Assessing educational achievement in the affective domain. Measurement in Education, *4*(3), 1-8.
[8] Ferro, T. R. (1993). The influence of affective processing in education and training. *New Directions for Adult and Continuing Education, (59), 25–33.* https://doi.org/10.1002/ace.36719935905
[9] Chan, T., Looi, C. K., Chen, W., Wong, L., Chang, B., Liao, C. C. Y., Cheng, H., Chen, Z., Liu, C., Kong, S., Jeong, H., Mason, J., So, H., Murthy, S., Yu, F., Wong, S. L., King, R. B., Gu, X., Wang, M., Wu, L., Huang, R., Lam, R., & Ogata, H. (2018). Interest-Driven Creator theory: Towards a theory of learning design for Asia in the twenty-first century. *Journal of Computers in Education*, *5*(4), 435-461. https://doi.org/10.1007/s40692-018-0122-0
[10] Miller, M. (2005). Teaching and learning in affective domain. In M. Orey (Ed.), Emerging perspectives on learning, teaching, and technology. Retrieved from http://epltt.coe.uga.edu/
[11] Smith, P. & Ragan, T.J. (1999). *Instructional design*. New York: John Wiley & Sons.
[12] Popham, W. (1994). Educational assessment's lurking lacuna: The measure of affect. *Education and Urban Society*, *26*(4), 404-416. https://doi.org/10.1177/0013124594026004007
[13] Anderson, L. W. & Bourke, S. F. (2000). *Assessing affective characteristics in schools* (2nd ed.). Mahwah, NJ: Lawrence Erlbaum Associates.
[14] Allport, G.W. (1935). Attitudes. In C. Murchison (Ed.), *A handbook of social psychology* (pp.798-844). London: Oxford University Press.
[15] Ajzen, I. & Fishbein, M. (2005). The influence of attitudes on behavior. D. Albarracín, B. T. Johnson, M. P. Zanna (Eds.). *The handbook of attitudes*, pp.173-221, Mahwah, NJ: Lawrence Erlbaum Associates.
[16] Wong, S.L. (2014). Assessing computer attitudes: Does it matter for teacher education in developing countries? In C. C. Liu, H. Ogata, S. C. Kong & Kashihara, A. (Eds.), In Main Proceedings of the 22nd International Conference on Computers in Education (pp.909-914). Nara, Japan: Asia-Pacific Society for Computers in Education.
[17] Cherry, K. (2019). Attitudes and behavior in psychology. Retrieved from https://www.verywellmind.com/attitudes-how-they-form-change-shape-behavior-2795897
[18] Yee, H.T.K., Luan, W.S., Ayub, A.F.M., Mahmud, R. (2009). A review of the literature: Determinants of online learning among students. *European Journal of Social Sciences, 8*(2), *246-252*.
[19] Murire, O. & Cilliers, L. (2019). Critical success factors to improve the adoption of social media in teaching and learning: A case study at a traditional university. *International Journal of Interactive Mobile Learning*. *13*(3), 81-94. https://doi.org/10.3991/ijim.v13i03.8485
[20] Fishbein, M & Ajzen, I. (1980). *Understanding attitudes and predicting social behaviour*. Englewood, Cliffs, New Jersey: Prentice Hall.

[21] Ismail, M., Che Razak, R., Yaacob, M. R., Zakaria, M. N., Amiruddin, N. H., Luqman, A. (2016) Predictive modelling of mobile marketing usage among generation Y: A preliminary survey. *International Journal of Interactive Mobile Learning*. *10*(2), 49-57 https://doi.org/10.3991/ijim.v10i2.5545

[22] Buabeng-Andoh, C. (2018). Predicting students' intention to adopt mobile learning: A combination of theory of reasoned action and technology acceptance model, *Journal of Research in Innovative Teaching & Learning*, *11*(2), 178-191 https://doi.org/10.1108/jrit-03-2017-0004

[23] Bere, A. & Rambe, P. (2016). An empirical analysis of the determinants of mobile instant messaging appropriation in university learning. *Journal of Computing in Higher Education, 28*(2), 172-198. https://doi.org/10.1007/s12528-016-9112-2

[24] Magogwe, J. & Jaiyeoba, O. (2019). ESL university students' attitudes towards using whatsapp in academic writing. *Global Journal of Computer Science and Technology: G Interdisciplinary, 19*(1), 13-18.

[25] Chen, H., Rong, W., Ma, X., Qu, Y. & Xiong, Z. (2017). An extended Technology Acceptance Model for mobile social gaming service popularity analysis. *Mobile Information Systems*, 1-12. https://doi.org/10.1155/2017/3906953

[26] Chuchu, T. & Ndoro, T. (2019). An examination of the determinants of the adoption of mobile applications as learning tools for higher education students. *International Journal of Interactive Mobile Learning*. *13*(3), 53-67. https://doi.org/10.3991/ijim.v13i03.10195

[27] Getzels, J. W. (1966). The problem of interests: A reconsideration. *Supplementary Education Monographs, 66*, 97-106.

[28] Wong, L., Chan, T., Chen, Z., King, R. B., & Wong, S. L. (2015). The IDC theory: Interest and the interest loop. Workshop Proceedings of the 23rd International Conference on Computers in Education, 804-813.

[29] Chan, T., Looi, C. K., & Chang, B. (2015). The IDC theory: Creation and the creation loop. *Workshop Proceedings of the 23rd International Conference on Computers in Education*, 814-820.

[30] Chen, W., Chan, T., Liao, C. C., Cheng, H. N., So, H., & Gu, X. (2015). The IDC theory: Habit and the habit loop. *Worshop Proceedings of the 23rd International Conference on Computers in Education*, 821-828.

[31] Lally, P., & Gardner, B. (2013). Promoting habit formation. *Health Psychology Review, 7*(1), S137-S158. https://doi.org/10.1080/17437199.2011.603640

[32] Sauer, K. (2012). The impact of student interest and instructor effectiveness on student performance. *Education Masters*. Paper 243. Retrieved from https://fisherpub.sjfc.edu/cgi/viewcontent.cgi?article=1244&context=education_ETD_masters

[33] Kpolovie, P.J., Joe A. I., Okoto, T. (2014). Academic achievement prediction: Role of interest in learning and attitude towards school. *International Journal of Humanities Social Sciences and Education. 1*(11), 73-100

[34] Li, X., & Yang, X. (2016). Effects of learning styles and interest on concentration and achievement of students in mobile learning. *Journal of Educational Computing Research, 54*(7), 922–945. https://doi.org/10.1177/0735633116639953

[35] Yang, X., Li, X. Lu, T. (2015). Using mobile phones in college classroom settings: Effects of presentation mode and interest on concentration and achievement. Computers & Education, *88*, 292-302 https://doi.org/10.1016/j.compedu.2015.06.007

[36] Wong, S.L. & Wong, S. L. (2019). Relationship between interest and mathematics performance in a technology-enhanced learning context in Malaysia. *Research and Practice in Technology Enhanced Learning, 14*(21). https://doi.org/10.1186/s41039-019-0114-3

8 Author

Su Luan Wong is a Professor at the Faculty of Educational Studies, Universiti Putra Malaysia.

Article submitted 2020-04-16. Resubmitted 2020-05-20. Final acceptance 2020-05-23. Final version published as submitted by the authors.