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Understanding learners' type and preferences towards utilizing web 2.0 to improve teaching/learning in Nigerian tertiary institutions

Uche Donatus Asogwa[a], Chinonye Virginia Onwuneme[b], Samuel C. Ogbonna[c], Celestine Unoh Nkanu[d*], Ben Eze[e], Abdullahi Mohammad[f]

[a,b,c,e & f] *University of Nigeria, Department of Arts Education, Nsukka. 410001 Nigeria*

[d] *University of Calabar, Department of Curriculum & Teaching, , 540242 Nigeria*

Abstract

Learners have their dominant intelligence which gave rise to the different learning styles, a dominant mode of information reception, processing, and storage. The study will determine the extent each learner group perceives the use of Facebook for learning as useful and easy to use. 213 students purposively sampled from five departments which participated in an e-learning initiative of a federal university in Southeastern Nigeria constitute the study sample. The study adopted a survey design. Barsch Learning-Style Inventory and Myers-Briggs Type Indicator (MBTI) were used to collect data for learner profiling, while a TAM questionnaire was used to measure learners' perceived usefulness, ease of use and behavioral intention to use Facebook as a learning tool. Findings from the study showed that there were more visual leaners among the study sample than other learner groups. Also, all learners irrespective of the learning style agreed that Facebook was useful and equally agree to have the intention to adopt it as a potential learning tool. It recommended that as web 2.0 technologies are being increasingly adopted and adapted for educational purposes, learners should be profiled according to the learning styles to determine which learner group would benefit most from a particular technology.

Keywords: Understanding Learners' Type; Multiple Intelligence; Web 2.0 Technology; Facebook; Tertiary Institutions

* Corresponding author: Celestine Unoh Nkanu ORCID ID: https://orcid.org/0000-0002-7987-8427
Email address: innaunoh@gmail.com

1. Introduction

1.1. Introduce the problem

The problem of profiling learners according to their learning styles and abilities has existed in academic discourse for decades now. Researchers and educators alike are still emphasizing the need for instructors and instructional designers to always take into cognizance the learner's learning styles and characteristics in planning their instructional strategies to give room for maximum learning outcomes and to have more active learner's participation other than a few gifted once (Nyaboke, Kereri & Nyabwari, 2021). Therefore, the present study seeks to profiling learners according to their learning styles and how there can benefit maximally.

Recall then in college while you used to equate your capacities with persons in your colleagues? In all classrooms, you may perhaps spot out an insufficient or every of these categorizations: the book worm, class clown, artist, jock, math genius, the well-smoothed ones, and even the notorious loafers (Chibana 2019). Many of us may have alleged that our capacities remained greater or that our contemporaries are short of some outstanding skills – for example the detested students scoring parallel F's were somehow ignored naturally. Different persons may study in diverse ways and the present instructional structure with its one-scope-for-all methods is perhaps providing for just a minority of students in the teaching space and the others are required to acclimatize or lose, as in the instance of the "slow" students (Felder & Silverman, 2010). Though, you may have perhaps overheard of the idea of learning styles beforehand, it may have been reduced to just visual, audio, and kinesthetic types of knowledge. The current study will trust further to unveil other various learning styles, found in the works of psychologist Howard Gardner's (2011) multiple intelligences, which include the visual, verbal, logical, auditory, social, intrapersonal, physical, and naturalistic learners?

The controlling thought of Gardner's theory of multiple intelligence is that intellect is not ended of a solitary worldwide unit, hence, its takings on a plural form. Everyone's intelligence is projected simply to a diverse degree, and it is by learning that all these intelligences would be cultivated and advanced. A person might be predicted to be extra attentive in learning if his/her dominant intelligence is considered and used as a substance to inspire more learning.

It is therefore important to consider learners' learning style characterized by their dominant intelligence type in instructional design and delivery (Alugar, 2021). Powell (2012); Carjuzaa and Kellough (2013) suggest that educators should integrate multiple intelligences and learning styles info into their teaching strategies. Hipsky (2011) offers proposals of diverse methods for educators to adjust their instructions to follow the scholars' learning styles. Silver et al. (2000) maintains that after scheming presentation evaluation for the class, the different learning styles is often combined with the multiple

intelligence. For example, verbal-linguistic intelligence, instructors might propose a distinct task connecting each of the different learning styles such as visual, auditory, kinetics and tactile learning styles. Apparently, same should be completed for logical-mathematical, spatial, kinesthetic, musical, interpersonal, intrapersonal, and naturalist forms of learning.

From the foregoing, it is obvious that in a particular learning environment, learners respond to a chosen instructional strategy differently hence, any chosen instructional strategy might be of advantage or disadvantage to some learners depending on their learning style. Unfortunately, most teachers do not have learning style information of their students neither do they profile their students with respect to the students' dominant intelligence type to guide instructional design and delivery. Therefore, it is important that any chosen learning strategy or material is examined to know the extent it matches the dominant learning style in a group of learners. Learner profiling according to learning styles and dominant intelligence is especially necessary now that many emerging technologies and materials are increasingly being adopted and adapted for classroom use. It is needful to identify which learner type prefers or accommodate which technology. Such technology which has enjoyed increasing patronage among educationist includes web 2.0.

Web 2.0 technologies according to Aharony (2008) are active internet applications that permit operators to interconnect by producing, sharing, and editing material. The innovation classically comprises Blogs, Forums, Wikis, micro-messaging, Cloud computing, RSS feeds, social networking tools, hypermedia sharing, social bookmarking, podcasts, among others (Moran, et al, 2011; Emmanuel, et al, 2013; Nadiahan & Cabauatan, 2021) 102–118). Web 2.0 technology is unlike the previous Web 1.0 which is branded as "read only web" (Drachsler, Hummel & Koper, 2008). Web 2.0 technology is a "read-write web" (Mohammad, 2011) which permit operators do extra than just recover material but also add, share or amend information.

Web 2.0; have made knowledge settings extra collaborating, creative, and circumstantial than previously (Lee, Williams & Kim. 2012). Since web 2.0 allows user/learner to create content and knowledge, the mark amid creators and patrons of content has continued to diminish. These technologies have equally shifted courtesy away from just seeing material, to accessing more persons (Brown & Adler, 2008). Stressing a sharing philosophy, Web 2.0 technologies inspire and permit educators and students to share thoughts and team up in a novel civilization. They also encourage instructors to reconsider the method they impart and study and to renovate our teaching practices, so that we can sustain more dynamic and expressive education.

Web 2.0 comes with potentials to produce added collaborative and influential learning atmospheres for students to grow and become awareness originators, producers, publishing supervisor, and inspectors (Richardson, 2009). Students' critical thinking

skills may improve better if given chance to frequently compare their individual gifts to those of other colleagues, and the confirmation of their comparative advantages in class might be influential incentive for knowledge (Hurlburt, 2008). Accordingly, Web 2.0 technologies can sustain an energetic common scholarship, offer chances and avenues for scholarly journal, offer predictions to provide active and effective response to students, and afford chances to support education in the scholar's Zone of Proximal Development (Hartshorne & Ajjan, 2009; Vygotsky, 1978).

In this study, the web 2.0 technology of interest is Social Networking technology. Social networks, as opine by Franklin and Harmelen (2017) are systems that permit individuals to interconnect for several purposes. Beneath the social network tools fall Facebook, WhatsApp, Telegram, twitter, Instagram amongst others. These tools serve the purpose of grouping individuals who share parallel benefits, see each other, have the similar profession, or share other peculiar attributes. The present study will consider Facebook in particular. The quantity of operators in Facebook, for instance, has touched more than 100 million handlers. Naidoo and Moussly (2017) noted that Facebook is the utmost general website for social networking amongst learners in the higher institutions. Owning a Facebook account permits a handler to have a profile, add groups, send and accept secluded messages, and several other functions (Mitrano, 2016; Blattner & Fiori, 2017; Korkmaz & Mirici, 2021).

Facebook has been noted as beneficial and supportive in number of ways for teaching and learning. For instance, Facebook offer a learning system known as Courses (The Facebook Classroom, 2008). Through this application an instructor and his/her class can connect to it and make a page for their personal course; and the instructor can be the administrator of that page, adding/editing/deleting info shared on the page. Blattner and Fiori (2017) also stated that Facebook perhaps brands the relationship between instructors and learners and makes it more constructive. In other way round, through Facebook, instructors can generate a learning community which students can join and interrelate with and learn together (Muñoz & Towner, 2009). Studies have shown a positive use and influence of Facebook in an instructional setting. In their study, Hurt, Moses, Bradley, Larson, Lovelace, Prevost, Riley, Domizi and Camus (2012) discovered that Facebook might aid to improve college learners' appointment in a particular knowledge situation by harmonizing classroom communal and inspiring academic discourse. Moran, Seaman, and Tinti-Kane (2011) discovered that Facebook holds an optimistic effect on the academic performance of students in Quetta city, the learners gain a more of awareness from it and effortlessly connect with one another, communication with friends, perceived worth, learning notes or share knowledge around research resources. In a similar study aimed at investigating the result of Facebook on refining the communication skills in English via blended teaching method, Dweikat (2016) found that students who participated in the blended learning facilitated through Facebook had improved communication skills more than students engaged in face-to-face

teaching. Zakana and fomsi (2019) conducted a study on the utilization of Edmodo and Facebook as social networking sites for attracting senior secondary Computer Science students in Bayelsa State, Nigeria. They found that both Edmodo and Facebook impacted students' motivation and engagement with Facebook having higher significant influence than Edmodo.

From the foregoing, it is obvious that several research have documented the educational utility of Facebook. However, studies are few which have tried to identify which learner's group would benefit more from this form of electronic enhanced learning. This present study would try to fill this gap, especially for a developing country such as Nigeria where technology adoption in education is still at an emerging stage.

Since web 2.0 for instance Facebook, as an emerging technology has successfully found useful applications in the classroom, it is important that learners are differentiated with respect to their preference of web 2.0 (Facebook). To achieve this, learners' need to be profiled first, according to their learning styles (or dominant intelligence). This is a major task of the present study. Then effort will be made to identify which learner type (learner group) prefers or accepts most, the use of web 2.0 (Facebook). This would ensure that this technology would be used to address learning needs of a particular learners' type whose learning preference and needs aligns with and can be best met with Facebook usage in teaching and learning. Furthermore, this would enhance the prescriptive value of web 2.0 (Facebook) as learning aid as it would be easier to prescribe learning intervention related to web 2.0 if it is known which particular type of learner prefers or benefits most from web 2.0. Therefore, the purpose of this study is to understand learner's types and their preferences towards the utilization of web 2.0 in teaching and learning in tertiary institutions.

1.2. Technology Acceptance Model

Assessing user preference for a particular technology could be explained under the preview of Technology Acceptance Model (TAM). TAM has been used to quantify just how operators receive certain technologies. It was announced by Davis, Bogozzi and Warshaw (1989) to describe computer utilization conduct. Meanwhile, this method has been applied to know the receipt of information technology in widespread empirical research (Venkatesh & Davis 2000). The method adopts that view around helpfulness and easiness of use are always the primary reasons of information technologies acceptance in organizations. TAM explains the perceived usefulness (PU) as the level to which an individual considers the use of a technology might improve their achievement. In the same vein, perceived comfort of usage (PCOU) denotes the level to which an individual trusts that utilizing a technology might be open to mental energy (Davis, Bogozzi & Warshaw, 1989). According to TAM users develop intention to utilize an exact system when they perceive such technology as quite useful and valuable in performing tasks. For

instance, web 2.0 technologies will be better preferred by different learner groups if they perceive these technologies as beneficial and calm to use.

In the present study, effort would be made to ascertain how different learners (categorized along learning styles) accept web 2.0 technologies, in particular Facebook as a learning tool. This research will seek to investigate how the different types of learners perceive Facebook as a valuable and calm to use for instructional activities. It will then go further to assess how these perceptions influence or predict their (behavioural) goal to utilize Facebook presently and in the future, since TAM hypothesized that users' intention to adopt and/or use a particular technology is determined by the extent they perceive the technology to be useful and easy to use. Therefore, following TAM, the present study would determine particular type(s) of learner who have the most mostly likely intention to prefer Facebook as a learning tool.

1.3. Gardener's Theory of Multiple Intelligence

One of the greatest contemporary theorists in teaching and learning styles is Howard Earl Gardner (1943–present), writer of the book Frames of Mind: Theory of Multiple Intelligences in 1983 exert an important influence on instruction and knowledge in several institutions around diverse groups and societies. Though, it did not arouse considerable attention among the educational psychology research community, it inspired a novel opinion of knowledge among instructors and practitioners (Gardner, 1993). His theory drove countless educational researchers, educators and practitioners to testing with novel ways of communicating information to students. Gardner (1983) projected that every person has, to a variable grade, seven primary forms of intelligences, namely (i) verbal-linguistic, (ii) logical mathematical, (iii) bodily-kinesthetic, (iv) visual-spatial, (v) auditory or musical, (vi) intrapersonal and (vii) interpersonal. He further included an eighth intelligence 'naturalist', which has to do with aptitudes regarding the normal world.

The visual or spatial learner is most time mentioned as a right-brained students. They are creative, think off the box and rapidly progresses to what they perceive somewhat than what they overhear.

Verbal learners are little dissimilar from the former group; verbal learners are expert at managing information over the usage of language. They outshine at listening, writing, reading, and speaking. Also, this group possess an exceptional retention for whatever they have recited and appreciate every category of chat game, jokes and poems. They are talented to resolve difficulties concerning statistics and can effortlessly decode mental visual information (Chibana 2019). This people also possess skilled of examining reason and outcome relations and incline to reason poorly. The auditory learner reasons in resonances(sounds) relatively than pictures. They reason sequentially and study best in a step-by-step approach. Unlike visual learners, they possess a faultless recollection for

discussions and adore debates and deliberations. They typically like working over issues in a cluster situation and bouncing notions off from other persons.

Intrapersonal, or solitary student alike uses self-study and labor solely. Typically, solitary students are at home with their moods, which is and what they are trained to achieved. Physical (kinesthetic) students are continually stirring and undertaking somewhat with their fingers. This group study optimally with their bodies engaged in the education procedure. This can mean whatever from producing creative works of the fingers to being intelligent to operate what is being studied. Such students profit from large seats that allow them to sketch and write. Lastly the realistic, these kinds of students process materials optimally when it is connected to discovering designs in nature and concerning scientific intellectual to the thoughtful of living beings. They habitually nurture up to be farmers, naturalists, or researchers. These students mainly adore existence outside and linking with Nature. They are frequently found detecting and rising plants and animals in rural locations.

1.4. State hypotheses and their correspondence to research design

Given that different learners exist, and these are characterized by their dominant intelligence type as noted in Gardner's theory of intelligence, it is necessary to profile learners in line with their dominant intelligence then identify which group of learners would benefit most from a chosen technology or prefer a particular technology most. Therefore, the present study would seek to identify which particular learner type based on the dominant intelligence type accepts or prefers web 2.0 (Facebook) as an instructional tool for effective teaching and learning.

2. Method

The research was undertaken inside the setting of learner who participate in a blended learning facilitated using Facebook. A Facebook group was created through which the students had access to class materials and learning content; participated in group learning and online tests. The students were purposively sampled from five departments which participated in an e-learning initiative of a popular federal university in South-eastern Nigeria.

These departments offer the course "Introduction to Biology", which was facilitated via online learning. This course was offered in the students' first year of study. It was mandatory for all students who registered for the course to partake in the blended learning because all the course content with every follow-up activity were uploaded to the Facebook group platform created especially for the course.

2.1. Participant (subject) characteristics

A total of 230 students registered the course and formed the study sample. The study adopted the quantitative approach both in data collection and analysis. Participants were also assured of the confidentiality of their response. Of the 230 questionnaires which were given out, 213 valid responses were gotten. The survey was prepared in English and administered online in the group Facebook page. It was face validated by two e-learning experts to ensure that items are appropriate and adequate. The questionnaire items were shared into three parts. The initial part sought to know the respondents' demographic information and consist of questions on department, gender, and age of respondents. The second part contains items which assess students learning style. The third part measured students' apparent ease of usage, useful and behavioural intention to use Facebook for academic activities.

2.2. Sampling procedures

The sample size for this study consisted of a total of 230 students who registered for the course.

2.2.1. Measures and covariates

Students' learning styles were determined using the Barsch Learning Style Inventory (BLI) and Myers-Briggs Type Indicator (MBTI). BLI was developed by Barsch (1996). BLSI measures learning style preference in three dimensions namely, Visual (V), Auditory (A), and Kinetics (K). Each dimension is measured by 8 items. The items are rated with a 3-point rating scale of: Often (3), Sometimes (2), Seldom (1). To determine a learners' style the total score for each of the three dimensions are obtained. The dimension with the highest score becomes the learners learning style preference. With the BLSI, the minimum score for each dimension is 8 while the maximum score is a total score of 24. BLI has been validated in a previous study and the items for each subscale showed high internal consistency. According to (Khan, Arif & Yousuf, 2019; Alavi & Makarem, 2015) BLSI had reliability coefficients between 0.81 and 0.89. In the current research, using a sample of 30 learners BLI showed high internal consistency in the different subscales: V (α = .870), A (α = .901) and K (α = .796). Overall, the reliablity of the BLI was α = .855. (See Table 1.)

Myers-Briggs Type Indicator (MBTI) was adopted for measuring other learning styles namely logical, verbal, social, intrapersonal and naturalistic. MBTI was developed by Mayers, McCaulley, Quenk, and Hammer (1998). (MBTI) measures learning style preference in ten dimensions namely, Social, Independent, Spatial, Verbal, Applied, Conceptual, Auditory, Visual, Creative and Pragmatic learning styles. MBTI has five parts with each part measuring two styles of learning. In the present study, the parts (Part 1, Part 2 and Part 3) were chosen. Part 1 measures social learning style and/or Intrapersonal learning style. Part 2 measures spatial learning style and/or verbal

learning style. Part 3 measures Applied learning style (here referred to as logical learning style) and/or Conceptual learning style (here referred to as Naturalistic learning style). For each of the parts, each item measures two responses (labeled a or b). Either of the response shows a preference of one the learning styles in each part. At the end of each part, a total of a learner's learning style preference is determined by counting how many times a learner chose a particular option (a or b) which represent two different learning style choices contained in that part. Each part is measured by 7 items. MBTI has been validated in previous studies and the items for each subscale showed high internal consistency (Salter, Evans & Forney, 2006; Ayadi, Chatterjee, & Woldie, 2006). According to Rimmerman (2005) MBTI had reliability in its sub-scales measured by Cronbach's Alpha coefficient, between 0.79 and 0.91. In the present study, MBTI for the three subscales used showed adequate reliability: first part (α = .822), second part (α = .862), third part (α = .791) and overall (α = .816). (See Table 1.)

The third part consists of questions which sought to ascertain students' preference of Facebook as an education means. Here, learners professed ease of usage, perceived worth and purpose to use Facebook were measured. These were measured utilizing scales modified from Davis, Bagozzi and Warshaw (1989); Venkatesh and Davis (2000). Perceived usefulness of Facebook comprised measures and enablement of the skill to achieve duties more rapidly, enhancement in performance, using the Facebook to grow efficiency and improve effectiveness. Perceived usefulness has four items on the scale. Apparent comfort of use measured easiness to study to use the Facebook, attainment what is desirable, interacting with the different Facebook tools clearly and concisely, ease of flexibility, and respondents' ease to become skillful. Perceived ease of use also has four items. Behavioral intention to use Facebook was examined as both a mixture of intention to resonant out given task now and in the impending using the Facebook. This scale contains 5 items. All the items as used in the present study were measured on a four-point rating scale of "strongly agree", "agree", "disagree" and "strongly disagree". An experimental test was directed amid a cluster of 30 students who were excluded from the actual survey to validate the items. The trial research exhibited that the scales were valid and consistent. (See Table 1.).

2.2.2. Research design

This study adopted a survey design. Data were obtained by means of a survey technique. The survey required that each student complete a consent form before taking the survey.

2.2.3. Experimental manipulations or interventions

Table 1. Summary of reliability of measures

Measures	Levels	Cronbach alpha

BLI	visual preferences	.870
	Auditory preferences	.901
	Kinesthetic preferences	.796
	OVERALL	.855
MBTI	Part 1	.822
	Part 2	.862
	Part 3	.791
	OVERALL	.816
TAM	PU	.796
	PEOU	.806
	BI	.881
	OVERALL	.831

The data for the final analysis were collected at the end of the course. To ensure a high response rate, students were informed that the questionnaire was part of their continuous assessment. Throughout the data analysis stage, members with matching admissions were removed. As a start, the students were classified according to the different learning styles based on their scores as obtained in the BLI and MBTI. Mean and standard deviation were employed as descriptive statistics. Students' mean response ratings of the perceived comfort of use, usefulness, and behavioral intention to use Facebook for learning activities were further described and classified based on real limits of numbers. The real limit of numbers used to interpret the results include: 3.50-4.00 (very high extent), 2.50-3.49 (high extent), 1.50-2.49 (low extent), and 0.50-1.49 (not applicable). To assess the extent students' learning style, predict their preference of Facebook as a knowledge tool, the TAM model was working, and its concepts tried using Regression analysis. The analysis was performed using SPSS version 20**.**

4. Results

Table 2. Learners' perceived comfort of usage, usefulness and behavioral intention to use Facebook for learning activities.

Learning styles	Number of students (n,%)	Perceived ease of use (Mean±Std)	Perceived usefulness (mean±Std)	Behavioral intention (mean±Std)
Verbal learners	(22,10.32)	2.95±1.00	2.55±.86	3.23±.81
Visual learners	(34,15.96)	2.47±.96	2.88±.84	2.97±1.05
Auditory learners	(29,13.62)	2.51±1.09	2.89±.90	3.03±.77
Logical learners	(32,15.02)	2.69±.82	2.84±.99	3.09±.93

Kinesthetic learner	(29,13.62)	2.58±1.01	2.97±.91	3.10±.56
Social learner	(27,12.68)	2.78±.93	2.85±.95	2.81±.83
Intrapersonal learner	(20,9.39)	2.55±1.00	3.00±.86	2.80±.89
Naturalistic learner	(20,9.39)	3.20±.70	3.10±.97	3.15±.67

From table 2 above, it could be observed that visual learners were the most dominant group in the sample (n = 34) while intrapersonal and naturalistic learners were the least dominant groups with 20 members each. Apart from visual learners who agreed to a low extent (mean score = 2.47) that Facebook use for learning activities was easy, all other learner types agreed to a high extent (mean scores > 2.50) that it was easy to use Facebook for learning activities. All leaners irrespective of their learning style agreed to a high extent (mean scores > 2.5) that Facebook was a useful tool for learning. Similarly, all learners agreed to a high extent (mean scores > 2.5) on the expression of intent to use Facebook whenever possible for learning activities presently and in the future.

Table 3.

Regression analysis of learner's intention to use Facebook as a learning tool.

Learning styles	Predictors	B	*T*	*P*	*B*	*F*	*Df*	*P*	R^2
Verbal learners	PEOU	-.089	-.351	.729	-.109	.406	19	.672	.041
	PU	-.248	-.842	.410	-.262				
Visual learners	PEOU	-.399	-1.94	.061	-.362	1.914	31	.164	.110
	PU	-.236	-1.01	.320	-.188				
Auditory learners	PEOU	.130	.921	.365	.182	.580	26	.567	.043
	PU	.130	.759	.454	.150				
Logical learners	PEOU	.244	1.160	.256	.216	.677	29	.516	.045
	PU	.028	-.162	.872	.175				
Kinesthetic learner	PEOU	-.175	-1.83	.078	-.321	3.687	26	.039	.221
	PU	-.186	-1.73	.096	-.302				
Social learner	PEOU	-.179	-1.02	.319	-.200	1.576	24	.227	.116
	PU	-.206	-1.19	.245	-.235				
Intrapersonal learner	PEOU	-.084	-.447	.660	-.094	5.385	17	.015	.388
	PU	-.601	-2.74	.014	-.577				
Naturalistic learner	PEOU	.399	1.509	.150	.414	1.486	17	.254	.149
	PU	.037	.193	.849	.053				

Table 3 shows a multiple linear regression which was calculated for each of the learner types to determine the extent learners' perceived ease of use (PEOU) and perceived usage (PU) influence and envisage learners' behavioral intention to use Facebook as a

knowledge tool. It was reveal that for verbal, visual, auditory and logical learners PEOU and PU did not significantly predict learners intention of utilizing Facebook as a learning instrument ($F(2, 19) = .406$, $F(2, 31) = 1.914$, $F(2, 26) = .580$, $F(2, 29) = .677$, $p > .05$ respectively) with $R^2 = .041, .011, .043, .045$, respectively. Similarly, for the social and naturalistic learners, non-significant regression equations were found ($F(2, 24) = 1.576$, $F(2, 17) = 1.486$, $p > .05$, respectively) with $R^2 = .116, .149$ respectively. However, PEOU and PU were found to significantly predict learners' intention of utilizing Facebook as a learning tool among intrapersonal learners ($F(2, 17) = 5.385$, $p = .015$, $R^2 = .388$) and kinesthetic learners ($F(2, 17) = 3.687$, $p = .039$, $R^2 = .221$). Here, PEOU and PU explained about 38.8% and 22.1% of the variability in learner's intention to use Facebook as a learning tool among intrapersonal learners and kinesthetic learners respectively.

5. Discussion

The present study sought to achieve two objectives. First, to profile learners, categorize them according to the different learning styles and determine the extent they perceive Facebook useful and easy to use as a learning tool. Second, to determine how a particular learner's style of learning influences his/her intention of utilizing Facebook as learning tool. The study results revealed that visual learners were the most dominant group (15.96%) in the sample while intrapersonal and naturalistic learners were the least dominant groups (9.39% each). Comparing the findings of the present study with similar findings which have sought to categorize university students according to their learning styles reveal similarities. In a study conducted among the 400 selected medical students, Alavi and Makarem (2015) found that a total of 180 (49.3%) students were visual learners, 106 (28.9%) were auditory learners, 27 (7.4%) had a tactual learning style and 53 (14.4%) students had a combined learning style. In another related study, Khan, Arif and Yousuf (2019) indicated that among a sample of 1200 college students enrolled in B.A. /B.Sc. and BS programs in the Punjab province of Pakistan, 52.9% were visual learners, 17.6% students were auditory and 8.5% students were kinesthetic learners. Similarly, Merrouche (2017) categorized a sample 72 students from the department of English, Faculty of Letters and Languages at Larbi Ben M'hidi University, Oum el Bouaghi, Algeria. The outcomes revealed that many of the respondents have a visual mode of studying, whether principally or in mixture with the auditory mode. These results agree with the findings of the present study which indicated that visual learning style appear to be the main learning style among university scholars.

Again, the present study showed that irrespective of students' learning style, Facebook was perceived as beneficial and easy usage. The students equally agreed to the expression of intent to use Facebook both presently and in the future. This result agrees with the findings of a previous study conducted among 105 Malaysian students by Alhazmi and Rahman (2013) which indicated that only 2.8% of the student did not have

the intention to use Facebook as a learning tool. Also, a study conducted by the EDUCAUSE Center for applied research in a large-scale study comprising 36,950 students from 126 US universities found that 90% of the students are using social networking tools in particular Facebook for different learning activities (Brown, & Adler, 2008). Similarly, in their study which sought to ascertain students' preference for the Facebook group forum and a university-sponsored online tool, Hurt, Moss, Bradley, Larson, Lovelace, prevost, Riley, Domizi and Camus (2012) found that students had Facebook as their clear preference. They also noted that scholars who partook in Facebook deliberations adored the site's responsiveness, navigability, and aesthetically attractive border. Facebook operators also stated that they were able to develop healthier familiarity with classmates, felt like appreciate members in the course. Furthermore, Meishar-Tal, Kurtz and Pieterse (2012) noted in their finding that scholars expressed gratification with studying in Facebook groups and readiness to remain utilizing the clusters in upcoming courses.

In addressing the second objective of the present study, it was found that only among the intrapersonal learners and the kinesthetic learners was the intention to accept or prefer web 2.0 technologies, specifically Facebook as a learning tool significantly predicted based on the learners' perceived usefulness and perceived ease of use of Facebook for learning. Learners' perceived ease of use and perceived usefulness of Facebook could not predict their intention to use Facebook among the verbal, visual, auditory, logical, social and naturalistic learners. This inability to predict learners' intention to use or prefer Facebook among majority of the learner groups suggests that there may be other underlying factors which significantly influence students' behavioral intention especially with respect to Facebook preference apart from learners' perceived ease of use and perceived usefulness of Facebook. In their study, Moghavvemi, Paramanathan, Rahin and Sharabati (2017) found that hedonistic motivation, apparent bounciness, and performance expectation were robust causes of learners aim to use e-learning via Facebook, although tradition and simplifying circumstances all absolutely affected learners use of e-learning via Facebook. In a similar study, Arteaga, Cotijo and Javed (2014) found that apart from apparent comfort of use and perceived worth, other important forecasters of Facebook adoption among students include: social influence, facilitating conditions and community identity. Also, perceived pleasure was realized to be a robust factor of attitude concerning utilizing Facebook as obtained by Praveena and Thomas (2014). In their findings, Sharma and Sharma (2016) reported that while teamwork is the most significant factor of Facebook acceptance for academic purposes, resource allocation, perceived pleasure, and perceived worth are equally other important predictors. Following these previous findings, it is clear that there are other factors which could influence intention to adopt Facebook as a learning tool. However, in the light of the findings of the present study, learners perceived worth and ease of usage of Facebook may have predicted the intention to use Facebook among kinesthetic and

intrapersonal learners due to in large part the inherent attribute of these learners which suite online learning.

5.1 . Implication for Education and Practice

The findings of the present study bear significant implication to the practice of education. First, as the controversy for the existence of learning styles continues, the present study tends to be of the opinion that students may have different ways through which one may prefer to receive, interpret and process information. Some researchers believe otherwise. Husmann and O'Loughlin (2018) is of the opinion that there is nothing like learning styles and therefore recommended that the conventional knowledge about learning styles would be rejected by teachers and scholars alike. Second, the findings of the present study in line with previous studies suggest that visual leaners appear to be more among higher education leaners. While this may not be taken as a general opinion, it points to the fact that there may be need to profile learners in any given learning condition. The information gotten about learners' style of learning could go a long way in guiding instructional planning and delivery. Third, present day learners being digital natives appreciate technology-driven learning. This is exemplified in the present study by the unanimous agreement obtained on the usefulness and ease of use of Facebook as a learning tool. Therefore, in designing instruction effort should be made to create opportunity whereby conventional technologies could be adapted in the process of learning.

5.2 *Limitations and recommendations for future study*

The present study made an attempt to categorize learner into different learning styles following Gardner's theory of multiple intelligence. This bears a cogent theoretical significance as the findings have shown that learners could indeed be classified based on their dominant intelligence. This proves the assumptions of multiple intelligence theory and thus, constitutes a major strength of the present study. However, it may be necessary to interpret the findings of the present study bearing the following limitations in mind.

First, only two variables (perceived usefulness and perceived ease of use) were used as predictors of learners' behavioral intention to prefer Facebook as a learning tool in the present study. However, previous studies showed that there could be other factors which could significantly influence users' behavior towards adoption of a particular technology, especially Facebook. This could limit the confidence reposed on the findings of the present study. Second, the chosen instrument for the study to measure Facebook perceived ease of use, perceived usefulness and behavioral intention to use, though face-validated and subjected to a reliability test may need to have been further subject to construct validity through factor analysis to ensure its adequacy of measuring what it truly purports to measure. Third, the sample of the present study included students in

the higher institution only. Therefore, the generalizability of its findings may only be limited among this group of students.

In other to overcome the limitations of the present study, future studies could consider more factors which could possibly predict students' preference for Facebook adoption as a learning tool among the different groups of learners. This would strengthen the predictive power of the models generated. Again, future study could also carry a full-scale validation of any chosen instrument to increase the trust reposed on the measurements obtained. Other population of leaners could also be profiled and their preference for Facebook as a learning tool determined. This will ensure effective comparison among the different levels of learner and could lead to possible significant generalization of findings.

6. Conclusions

The present study sought to achieve two objectives. First, to profile learners, categorize them according to the different learning styles and determine the extent they perceive Facebook useful and easy to use as a studying resource. Second, to determine how a particular learner's style of learning influences his/her intention to use Facebook as a learning tool. In line with these objectives, it was found that while there were more visual leaners among the study samples, all learners irrespective of the learning style agreed that Facebook was useful and equally agree to have the intention to adopt it as a potential learning tool. The findings also showed that behavioral intention of intrapersonal and kinesthetic learners to use Facebook could be predicted based on their perceived ease of use and perceived usefulness of Facebook. It was recommended that as web 2.0 technologies are being increasingly adopted and adapted for educational purposes, learners should be profiled according to the learning styles to determine which learner group would benefit most from a particular technology.

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