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Technology and Learning Styles in the GE Classroom: Towards Developing Blended Learning Systems for the 21st Century Learner

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Abstract

This study determined the relationships between the characteristics, learning styles and preferred teaching styles of the 21st century learner, and the learning technologies used in teaching general education (GE) courses at the University of the Philippines Los Baños (UPLB). A total of 260 BS Development Communication (BSDC) students were surveyed in this study. Data gathered were analyzed using descriptive statistics and chi square test of independence. Findings revealed that BSDC students had diverse learning styles. Many of them were classified as reflector (50%) and visual (43.8%) learners. Based on CORD's teaching style inventory (2005), they preferred teachers whose goals focused on analysis and familiar applications (62.7%), and whose methods emphasized hands-on activities conducted individually (40.4%). The GE teachers employed a variety of course requirements, modes of delivery, educational media, and online learning tools that addressed the diverse learning styles of students. To facilitate effective delivery of learning outcomes, the students recommended to blend face-to-face instruction with their preferred online learning tools such as e-group, social network, learning management system, and video sharing websites.At 0.05 level of significance, the learners' gender and age were found to be significantly related with Honey and Mumford's learning style model while their major field of specialization was significantly related with Dunn and Dunn's learning style theory. Significant relationships were also found between the preferred teaching methods of the students and the educational media used in GE courses under the Social Science and Philosophy (SSP) domain. On the other hand, findings showed that the students' learning styles and preferred teaching styles were not related with their preferred online learning tools and learning technologies used in GE courses.

Keywords: learning style, preferred teaching style, educational media, online learning tools, course requirements, modes of delivery

1. Introduction

The learning preferences of the 21st century learners have been greatly influenced by their competency in using various information and communication technologies (ICTs). Their usage of technology outside of academic settings has continued to influence their learning styles, strengths, and preferences (Dede, 2007).

Over the years, various educational researches have focused on technology integration in the classroom because of how it continues to reshape the teaching and learning environments. When using technology as a learning tool, Brown, et al (2009) suggested that teachers should consider the characteristics and learning styles of the students they teach. Dunn (1990) added that students could learn almost any subject matter when they are taught with methods and approaches responsive to their learning styles and strengths.

This study sought to analyze the dominant learning styles and preferred teaching styles of BS Development Communication (BSDC) students of the College of Development Communication (CDC), University of the Philippines Los Baños (UPLB). In addition, this study aimed to determine how these styles relate with the learning technologies and instructional methods used by the general education (GE) teachers inside the classroom. Findings of this study can be used by the GE teachers in designing learning environments that will deliver effective learning outcomes, specifically, in selecting appropriate technologies, designing teaching and learning strategies, and combining online learning and face-to-face instruction.

The UPLB GE Program primarily aimed to develop students' skills in oral and written communication, and critical and creative thinking. Currently, there are 34 GE courses categorized under three domains: the Arts and Humanities (AH); Mathematics, Science and Technology (MST), and Social Science and Philosophy (SSP). BSDC students must choose 15 units of GE courses from each domain to acquire competencies in the different basic areas of knowledge.

2. Objectives of the Study

This study aimed to analyze the relationship between the learning technologies used in GE courses at UPLB and the characteristics, learning styles, and preferred teaching styles of the 21st century learners. In addition, the study determined the students' preferred online learning tools that can be used to blend with face-to-face instruction.

3. Conceptual Framework

Figure 1 shows the conceptual framework of the study.

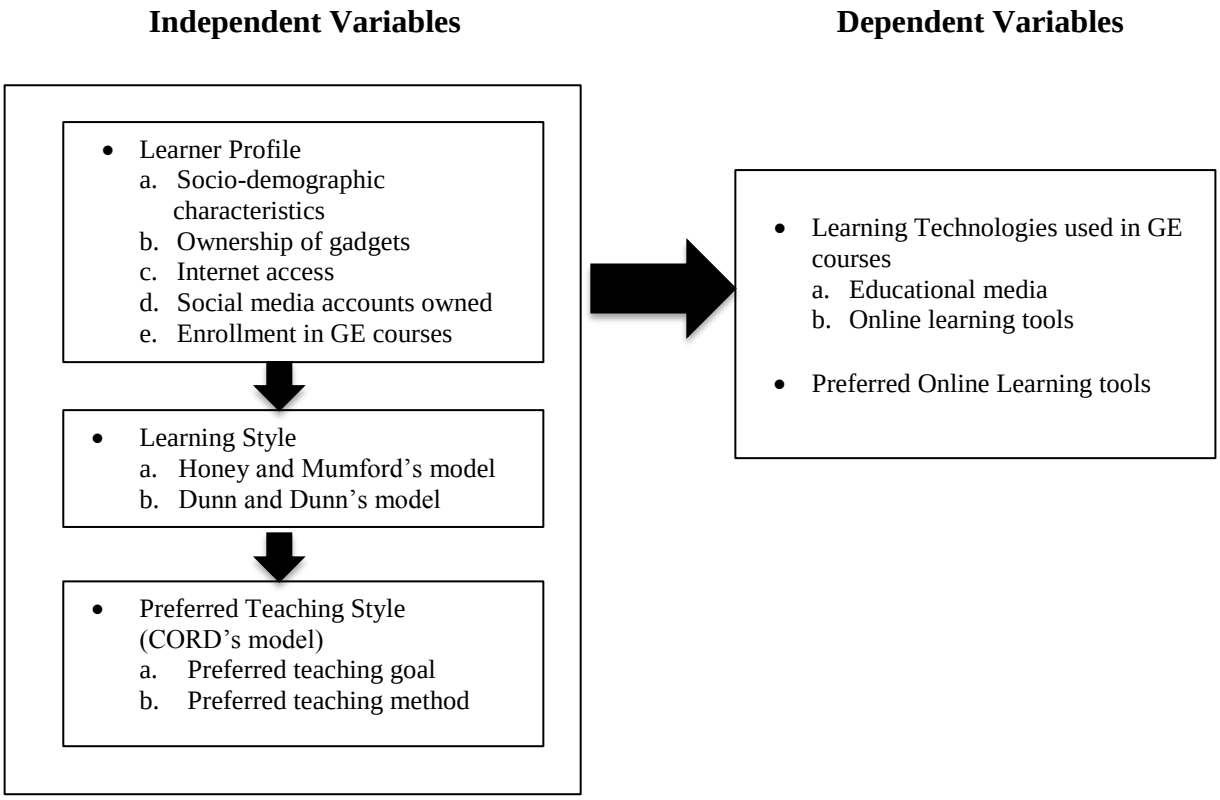

Figure 1. Conceptual framework of the study.

4. Methodology

This study used the survey research design. According to Wiersma and Jurs (2009), cross-sectional designs involve data collection at one point in time from a random sample representing a given population.

4.1. Sampling Procedure

Overall, there were 737 BSDC students enrolled in the First Semester, Academic Year 2012-2013. Using Slovin's formula, 260 students were selected as samples of the study. Stratified random sampling was employed in determining the number of students for each year level.

4.2 Research Instrument

The self-administered questionnaire used in this study was divided into five parts. The first part asked about the students' socio-demographic characteristics, ownership of electronic gadgets, and access to the internet. The second part determined the educational media and online learning tools commonly used in GE courses. The third part identified the preferred online learning tools that students think can be blended with face-to-face instruction to help them improve their learning performance. The fourth part adopted the learning style questionnaires developed by Honey and Mumford, and Dunn and Dunn (Penger and Tekavcic, 2009). Lastly, the fifth part adopted CORD's teaching style inventory (2005). It consisted of two dimensions of teaching style, namely, the teaching goal dimension and the teaching method dimension.

4.3. Data Collection

Survey questionnaires were distributed to selected BSDC students. Meanwhile, 34 GE course guides were collected and examined. Course guides were handouts given by the teachers at the start of the semester. They contained the course description, course goals and

objectives, course outline, grading system, course requirements, mode of delivery, and class guidelines and policies. Using a coding system, the course requirements and mode of delivery indicated in the course guides were analyzed.

4.4 Data Analysis

Descriptive statistics such as means and percentages were used to analyze data. In determining the relationship among variables, Pearson Chi-square Test of Independence was used.

5. Results and Discussion

5.1. Learner Profile

5.1.1. Socio-demographic characteristics of BS Development Communication students. Most of the respondents were female (77.7%) whose age ranged from 16-17 years old (51.5%). One third of them were freshman students (33.8%). A big majority did not have any major yet (60%). Many of those who already have a major field of specialization took educational communication (17.7%). With regard to the Socialized Tuition and Financial Assistance Program (STFAP) bracket, more than half of the respondents belonged to Bracket B. This bracket indicates that the students' family income is from PhP500,001 to PhP1,000,000. Students under this bracket pay the base tuition fee amounting to PhP1,000 per unit, and the miscellaneous and laboratory fees.

Table 1. Socio-demographic characteristics of respondents

Socio-demographic characteristics	Frequency (n=260)	% (100)
1. Gender		
Female	202	77.7
Male	58	22.3
2. Age		
15	4	1.5
16	56	21.5
17	78	30.0
18	42	16.2
19	43	16.5
20	22	8.5
21	9	3.5
22	2	0.8
23	2	0.8
24	2	0.8
3. Classification		
Freshman	88	33.8
Sophomore	68	26.2
Junior	52	20.0
Senior	52	20.0
4. Major		
Educational Communication	46	17.7
Science Communication	26	10.0
Community Broadcasting	16	6.2
Development Journalism	16	6.2
None	156	60.0
5. STFAP Bracket		
A	20	7.7
B	145	55.8
C	52	20.0
D	33	12.7
E1	8	3.1
E2	2	0.8

5.1.2. Ownership of Electronic Gadgets. Table 2 lists the electronic gadgets owned by the students. The top three gadgets owned by the students were cellphone (98.1%), laptop (80.4%), and digital camera (56.2%). On the other hand, very few students owned video camera (12.7%) and tablet computer (11.2%). The students noted that they primarily used cellphones for personal purposes such as sending and receiving text messages, taking pictures, and accessing their social network accounts.

Of the electronic gadgets identified by the students, laptops served as the most important in fulfilling their academic requirements. They used laptops in doing their assignments and other written requirements; designing posters, leaflets, exhibits, and other projects; editing pictures and video presentations; doing research activities via the internet; and accessing the handouts and lecture presentations posted by their teachers in their e-group, social network, and MOODLE accounts.

More than half of the students owned digital cameras which were also capable of recording video. They considered this as a requirement for communication students because

they have a course on basic photography. They added that most of their projects require pictures and video presentations.

Table 2. Electronic gadgets owned by the respondents

Electronic Gadgets Owned	Frequency (n=260)	% (100)
Cellphone	255	98.1
Laptop	209	80.4
Digital camera	146	56.2
Desktop computer	98	37.7
Portable music player	90	34.6
Game device	44	16.9
Video camera	33	12.7
Tablet computer	29	11.2

5.1.3. Internet Access. Many respondents accessed the internet at home (38.1%) because of more reliable internet connection (Table 3). On the average, they accessed the internet everyday (39.2%) with less than 10 hours per week (40.4%). Most of their time spent online were primarily used in updating their social network accounts, checking their emails, downloading videos and songs, and doing research activities for their assignments and projects.

Table 3. Respondents' access to the internet

Internet Access	Frequency (n=260)	% (100)
Place of Internet access		
Home	99	38.1
Apartment/Dormitory	69	18.5
University facilities	48	26.5
Computer shop	44	16.9
Frequency of internet access		
Everyday	102	39.2
5-6 days / week	45	17.3
3-4 days / week	79	30.4
1-2 days / week	34	13.1
Time of internet access		
<10 hours / week	105	40.4
11-20 hours / week	72	27.7
21-30 hours / week	42	16.2
31-40 hours / week	28	10.8
>40 hours / week	13	5.0

5.1.4. Social Media Accounts Owned by Students. The social media accounts owned by BSDC students were grouped in Table 4. These accounts were used to link with friends; share pictures and videos; share personal information and experiences; entertain one's self; and post some announcements. Students owned and accessed one or more accounts for each type of social media.

Almost all students have social network (99.2%) and e-group (95.0%) accounts. These were used both for personal and academic purposes. Most of them used Facebook (78.7%) and accessed Yahoo! Group (74.5%). When they were connected online, they send messages to their families and friends via instant messaging application (83.1%) using Yahoo!

Messenger (67.1%) and Skype (51.4%). According to them, these were relatively cheaper than calling sending text messages using cellphones because they use the free wifi connections available in the university.

Table 4. Social media accounts owned by the respondents

Social Media	Frequency (n=260)	% (100)
Social network	258	99.2
e-group	247	95.0
Instant messaging	216	83.1
Microblogs	194	74.6
Video sharing	187	71.9
Blogs	110	42.3
Photo sharing	90	34.6
Online games	60	23.1
Wikis	23	8.8

5.2. Learning Technologies used in General Education Courses

In analyzing the learning technologies, this study determined the educational media and online learning tools used by the teachers to facilitate learning in GE courses.

5.2.1 Educational Media.

Findings showed that the most frequently used educational media under the three domains of GE courses were slide presentation, handout, blackboard/whiteboard discussion, book, video/film showing, and live/actual demonstration (Table 5). The students noted that these educational media were relevant with the instructional methods in class since all teachers used lecture-discussion as the primary mode of delivery. Meanwhile, the teachers noted that they preferred to use these media because of their capability to present information to a large number of people simultaneously, and ease of use.

Table 5. Educational media commonly used inside the classroom

Educational Media	AH Domain		MST Domain		SSP Domain	
	Frequency (n=260)	% (100)	Frequency (n=260)	% (100)	Frequency (n=260)	% (100)
Slide presentations	251	96.5	252	96.9	254	97.7
Handout	243	93.5	241	92.7	251	96.5
Blackboard/whiteboard discussions	201	77.3	224	86.2	228	87.7
Book	200	76.9	214	82.3	214	82.3
Video	184	70.8	163	62.7	161	61.9
Live/actual demonstrations	121	46.5	144	55.4	117	45.0
Actual object/specimen						
Exhibit	80	30.8	122	46.9	106	40.8
Model/mock-up	74	28.5	95	36.5	88	33.8
Flipchart	70	26.9	75	28.8	87	33.5
Newspaper	62	23.8	70	26.9	69	26.5
Poster	61	23.5	55	21.2	67	25.8
Magazine	52	20.0	54	20.8	56	21.5
Manual	40	15.4	19	7.3	31	11.9
Radio	29	11.2	17	6.5	25	9.6
	13	5.0	3	1.2	13	5.0

5.2.2. Online Learning Tools.

With regard to the online learning tools used in GE courses, it was found out that the three domains of GE courses most commonly used the e-group, social network, video sharing websites, and learning management system (LMS) as learning supplements to face-to-face discussion (Table 6). These tools were used by the teachers in posting their handouts, lecture presentations, assignments, class announcements, and links to useful internet sources and references. These also served as a forum for students and teachers to further clarify the lessons discussed in class.

Table 6. Online learning tools commonly used inside the classroom

Online Learning Tools	AH Domain		MST Domain		SSP Domain	
	Frequency (n=260)	% (100)	Frequency (n=260)	% (100)	Frequency (n=260)	% (100)
e-group	172	66.2	197	75.8	207	79.6
Social network	142	54.6	123	47.3	155	59.6
Video sharing	67	25.8	87	33.5	68	26.2
LMS	26	10.0	35	13.5	28	10.8
Vodcasts	23	8.8	26	10.0	25	9.6
Wikis	22	8.5	24	9.2	19	7.3
Blogs	18	6.9	21	8.1	15	5.8
Podcasts	16	6.2	15	5.8	14	5.4
Instant messaging	13	5.0	13	5.0	10	3.8
Photo sharing	11	4.2	12	4.6	8	3.1
Microblogs	9	3.5	10	3.8	6	2.3
Online games	2	0.8	7	2.7	5	1.9

5.3. Online Learning Tools Preferred by Students

The students suggested online learning tools that they think could help them in improving their learning performance (Table 7). Almost all mentioned that they wanted to receive their academic standing in class and evaluation or assessment reports using e-group (93.5%) and email (93.1%). To encourage more student participation in class, they recommended the integration of social network, particularly Facebook (88.1%), LMS (84.6%), and video sharing application (78.5%) with face-to-face instruction. This result corresponds with the online learning tools used by the teachers in the AH, MST, and SSP domains as listed in Table 6.

Table 7. Online learning tools preferred by students

Online Learning Tools	Frequency (n=260)	% (100)
e-group	243	93.5
e-mail	242	93.1
Social network	229	88.1
Virtual learning environment	220	84.6
Video sharing	204	78.5
Blogs	179	68.8
Internet forum/ Webboard	176	67.8
Wikis	166	63.8
Vodcasts	155	59.6
Podcasts	143	55.0
Photo sharing	114	43.8
Microblogs	107	41.2
Instant messaging	104	40.0
Online games	84	32.3

5.4. Problems in the GE Classroom

In general, the problems enumerated by the students were brought about by the implementation of the Large Class Scheme to accommodate more students in the university (Table 8). This scheme accommodated at least 160 students in one lecture class. For instance, almost all students said that some of them cannot clearly see the lecture presentations inside the classroom because the layout of the classroom was not conducive for large lecture class setting (91.9%). Moreover, most of them mentioned that there is less student-teacher interaction (87.3%), and the teachers cannot monitor if students are not attentive in class (79.6%).

Table 8. Problems inside the GE classroom.

Problems	Frequency (n=260)	% (100)
1. Some students cannot see the lecture presentations clearly.	239	91.9
2. There is less student-teacher interaction.	227	87.3
3. Teachers cannot monitor if students are not attentive in class.	207	79.6
4. There are too many students in the lecture.	202	77.7
5. Sometimes, students have negative attitude towards learning and their motivation to learn is low.	191	73.5
6. There is less interaction among students.	190	73.1
7. There are too many lessons in the course outline for such limited time in the lecture and recitation classes.	183	70.4
8. Assessment of students' learning is not given on time.	168	64.6
9. Sometimes, teaching strategies and learning activities are not appropriate.	168	64.6
10. Learning materials such as photocopying of handouts and production of projects and assignments are quite expensive.	159	61.2
11. There are too many course requirements.	145	55.8
12. The facilities are outdated.	134	51.5
13. Students easily get distracted inside the classroom.	127	48.8
14. The facilities such as the microphones, computers, and LCD projectors do not function properly.	122	46.9
15. There are too many students in the recitation class.	55	21.2

5.5. Learning Styles of BS Development Communication Students

5.5.1. Honey and Mumford's Learning Style Model. This model categorized the students into four – Reflector, Pragmatist, Theorist and Activist (Clark, 2004). Based from the results of the learning style inventory, half of the students have been categorized as reflectors (50%) (Table 9).

Honey and Mumford (1986) explained that reflectors prefer to look at things from different perspectives (Rosewell, 2004). They are very careful in making a decision. Before arriving at any conclusion or decision, they like to collect data thoroughly, assimilate information, and analyze or interpret events. They study all possible angles and implications. They like to observe other people in action. The learning strategies most suited for reflectors include those that will allow them to think and ponder on activities, observe, and brainstorm. They should also be given enough time to finish their requirements since they tend to be cautious in doing them.

5.5.2. Dunn and Dunn's Learning Style Model. The students were classified as either visual, auditory, or kinesthetic learners in Dunn and Dunn's learning style model (Penger and Tekavcic, 2009). Findings showed that 43 percent of BSDC students were visual learners (Table 9).

Visual learning style involves the use of pictorial representations since the students mostly learn by seeing (Penger and Tekavcic, 2009). Visual learners prefer to see or read information and instructions because they tend to forget information that has only been heard. They enjoy writing, drawing, and imagining. They prefer to create their own notes and to read for themselves. They are not as proactive as the other types of learners. They observe more rather than talk or act. According to Roell (2012), the learning strategies most suited for visual learners were the ones commonly used inside a traditional classroom. Teachers can supplement lecture discussions with educational media such as slide presentations, handouts, videos, and actual objects and specimens, among others. In addition, since verbal directions tend to confuse the visual learners, the teachers can give written instructions and provide written feedback on the outputs of the students. Teachers were also encouraged to vary their mode of delivery (such as lecture, demonstration, group work, individual activity) and the type of requirements (such as assignments, projects, quizzes, examinations) from time to time.

Table 9. Learning styles of BSDC students

Learning Style	Frequency (n=260)	% (100)
a. Honey and Mumford's model		
Reflector	130	50.0
Pragmatic	56	21.5
Theorist	45	17.3
Activist	29	11.2
b. Dunn and Dunn's model		
Visual	114	43.8
Auditory	92	35.4
Kinesthetic	54	20.8

5.6. Preferred Teaching Styles of BSDC Students

In analyzing the preferred teaching styles of the students, this study adopted CORD's teaching style inventory (2005). It consisted of two dimensions of teaching style, namely, the teaching goal dimension and the teaching method dimension.

Table 10 shows that a big majority of the students would like to have teachers whose teaching goals are focused on analysis or critical thinking rather than rote learning or memorization of information. They also prefer teachers who put more attention on familiar applications or applied representation of concepts rather than abstract ones (62.7%). Meanwhile, the students preferred teaching methods that put more emphasis on hands-on activities. Students would also like to work individually rather than work in groups (40.4%).

Table 10. Preferred teaching styles of BSDC students

Preferred Teaching Style	Frequency (n=260)	% (100)
Preferred Teaching Goal		
Type 1 (Abstract-Rote)	14	5.4
Type 2 (Applied-Rote)	44	16.9
Type 3 (Abstract-Understanding)	39	15.0
Type 4 (Applied-Understanding)	163	62.7
Preferred Teaching Method		
Type 1 (Individual-Symbolic)	36	13.8
Type 2 (Cooperative-Symbolic)	45	17.3
Type 3 (Individual-Enactive)	105	40.4
Type 4 (Cooperative-Enactive)	74	28.5

5.7. Instructional Methods Used in GE Courses

In analyzing the instructional methods used in GE courses, this study examined the course requirements and modes of delivery listed in the course guides. Course requirements and modes of delivery in GE courses vary from one teacher to another. Table 11 shows that all GE courses require students to take written examinations (100%). Meanwhile, almost all GE courses gave written quizzes as course requirement (91.2%). Both the examinations and quizzes were done by the students individually and tested the students' knowledge on the theoretical lessons discussed in class. On the other hand, most GE courses also have group projects (82.4%) and individual written reports (79.4%). Unlike examinations and quizzes, these requirements focused more on the practical applications of the lessons in real life situations. Group projects included exhibits, video presentations, group poster, IEC materials, and campaigns, among others. Meanwhile, individual written reports included reaction papers, reflection papers, case analysis, field trip reports, philosophical papers, synthesis papers, autobiography, and critical essays.

The mode of delivery comprised all the classroom activities or teaching and learning methods used inside the classroom. Table 11 shows that all GE courses (100%) used lecture-discussion. This mode of delivery was teacher-controlled. Most of the time, the students were just passive recipients of knowledge. To encourage the students to actively engage in the lecture-discussions, most teachers also conducted games (76.5%), facilitated group discussion and workshops (73.5%), and allotted time for presentation of students' outputs (67.5%).

Table 11. Instructional methods used in GE courses

Instructional Method	Frequency (n=34)	% (100)
Course Requirement		
Examination	34	100.0
Quiz	31	91.2
Group project	28	82.4
Individual written report	27	79.4
Assignment	22	64.7
Exercise	20	58.8
Group oral presentation	19	55.9
Group written report	18	52.9
Individual oral report	11	32.4
Individual project	11	32.4
Mode of delivery		
Lecture	34	100.0
Game	26	76.5
Group discussion/workshop	25	73.5
Presentation of output	23	67.6
Exercise	21	61.8
Film showing	16	47.1
Field trip	9	26.5
Watching concerts, plays, and other performances	8	23.5
Seminar		
Food festival	4	11.8
Listening to music	2	5.9
	2	5.9

5.8. Relationship Between Variables

5.8.1. Learner's Profile and Learning Styles. At 5% level of significance, chi-square results showed that only the students' gender and age were significantly related with their learning style model based on Honey and Mumford's learning style model (Table 12). In addition, only their major field of specialization was significantly related to their learning style based on Dunn and Dunn's learning style model.

Meanwhile, findings revealed that the students' ownership of gadgets, access to the internet, and social media accounts owned were not related with their learning styles since the computed p-values were greater than 0.05 alpha.

Table 12. Relationship between profile and learning styles of students

Learner Profile	Honey and Mumford's Model		Dunn and Dunn's Model	
	Chi-Square Value	p-value	Chi-Square Value	p-value
a. Socio-demographic characteristics				
Gender	7.963	0.047 **	0.586	0.746 ns
Age	47.129	0.010 **	21.570	0.252 ns
Classification	10.937	0.280 ns	8.025	0.236 ns
Major	18.394	0.104 ns	32.295	0.000 **
STFAP bracket	12.189	0.665 ns	10.383	0.408 ns
b. Ownership of gadgets	16.632	0.733 ns	3.275	0.998 ns
c. Internet access				
Place of access	10.188	0.335 ns	1.744	0.942 ns
Time of access	10.548	0.568 ns	3.113	0.927 ns
Frequency of access	4.138	0.902 ns	7.909	0.245 ns
d. Social media accounts owned	15.321	0.807 ns	5.417	0.979 ns

** significant at 5%; ns-not significant

5.8.2. Learning Styles and Preferred Teaching Styles of BSDC Students.

Findings revealed that only the students' learning styles based on Dunn and Dunn's model was related with their preferred teaching goals (Table 13). In addition, the computed p-values showed that the preferred teaching methods and learning styles of students were not related.

Table 13. Relationship between preferred teaching styles and learning styles of BSDC students.

Preferred Teaching Style	Honey and Mumford's Model		Dunn and Dunn's Model	
	Chi-Square Value	p-value	Chi-Square Value	p-value
Preferred teaching goal	12.131	0.206 ns	12.636	0.049 **
Preferred teaching method	3.642	0.933 ns	9.064	0.170 ns

** significant at 5%; ns-not significant

5.8.3. Learning Technologies Used in GE Courses and Learning Styles of Students.

Based from the computed p-values, this study found out that the educational media and online learning tools used in GE courses were not significantly related with the students' learning styles based on Honey and Mumford's and Dunn and Dunn's learning style models (Table 14).

Table 14. Relationship between profile and learning styles of students

Learning Technologies	Honey and Mumford's Model		Dunn and Dunn's Model	
	Chi-Square Value	p-value	Chi-Square Value	p-value
a. Educational Media				
AH domain	18.610	0.999 ns	21.512	0.996 ns
MST domain	23.756	0.990 ns	25.061	0.982 ns
SSP domain	18.032	1.000 ns	20.124	0.998 ns
b. Online Learning Tools				
AH domain	29.369	0.649 ns	18.642	0.667 ns
MST domain	29.243	0.655 ns	29.220	0.139 ns
SSP domain	31.190	0.557 ns	21.277	0.504 ns

** significant at 5%; ns-not significant

5.8.4. Learning Technologies Used in GE Courses and Preferred Teaching Style of Students.

The preferred teaching style of students was determined using the teaching goal and teaching method domains (Table 15). Findings show that there were no significant relationship between the preferred teaching goal and the educational media used in general education courses since the computed p-values were greater than 0.05 alpha. With regard to preferred teaching method, significant relationship was only found between educational media in GE courses under the SSP domain and the preferred teaching method of students since p-value of 0.000 is less than the 0.05 alpha.

Meanwhile, chi-square results showed that online learning tools used in GE courses were not related with the preferred teaching styles of students since the computed p-values both in the teaching goal and teaching method domains were greater than 5% level of significance (Table 15).

Table 15. Relationship between educational media used in general education courses and preferred teaching styles of students

Learning Technologies	Preferred Teaching Goal		Preferred Teaching Method	
	Chi-Square Value	p-value	Chi-Square Value	p-value
a. Educational Media				
AH domain	21.512	0.996 ns	16.566	1.000 ns
MST domain	25.061	0.982 ns	15.852	1.000 ns
SSP domain	20.124	0.998 ns	80.188	0.000 **
b. Online Learning Tools				
AH domain	20.735	0.952 ns	13.966	0.999 ns
MST domain	15.885	0.995 ns	36.755	0.299 ns
SSP domain	21.653	0.935 ns	19.949	0.964 ns

** significant at 5%; ns-not significant

5.8.5. Preferred Online Learning Tools, Learning Styles, and Preferred Teaching Styles of BSDC Students.

Findings revealed that the preferred online learning tools of BSDC students were not significantly related with their learning styles and preferred teaching styles since the computed p-values were greater than 5% level of significance (Table 16).

Table 16. Relationship between preferred online learning tools, learning styles and preferred teaching styles of students

Variables	Chi-Square Value	p-value
a. Learning style		
Honey and Mumford's Model	15.540	1.000 ns
Dunn and Dunn's Model	8.427	1.000 ns
b. Preferred teaching style		
Teaching goal	7.965	1.000 ns
Teaching method	10.840	1.000 ns

** Significant at 5%; ns-not significant

6. Conclusion

As 21st century learners, BSDC students at the College of Development Communication (CDC), University of the Philippines Los Baños (UPLB) exhibited diverse characteristics and learning styles. They preferred teachers whose teaching goals focus on analysis or critical thinking and on applied representation of concepts rather than abstract

ones, and whose teaching methods put more emphasis on hands-on activities and individual work.

In UPLB, traditional classroom instruction has been the most prevalent form of teaching. The GE teachers used various learning technologies, course requirements, and modes of delivery to address the different characteristics and learning styles of students, and the problems experienced in the classroom. The students emphasized the integration of their preferred online learning tools such as e-group, e-mail, social network, and learning management systems with face-to-face instruction to enhance current teaching and learning practices.

This study recognizes the role of technology in engaging and motivating the learners inside the 21st century classroom. Therefore, further studies on the design, implementation, management, and evaluation of online and blended learning systems that can be adopted in the GE classroom are recommended by this study.

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