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AN ASSESSMENT OF THE INFORMATION TECHNOLOGY STUDENTS' LEARNING STYLES IN A PHILIPPINE STATE UNIVERSITY

Las Johansen B. Caluza, Jeffrey C. Cinco, Raphy Dalan, Devine Grace D. Funcion, Micheline A. Gotardo, Mark Lester Laurente, Lowell A. Quisumbing, Dennis Tibe, Debby Turco and Rommel L. Verecio

Leyte Normal University, Tacloban City, Philippines

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ABSTRACT

Learning style alludes to the uncommon ways a person handles and holds new information and skills. This study aimed to determine the learning styles of the BS Information Technology students of the Leyte Normal University, Tacloban City, to design and implement educational interventions responsive to the needs of the students. A descriptive survey method was used, which involved a questionnaire utilizing google forms. A total of four hundred forty-seven (447) students who are currently enrolled last school year 2019 – 2020 served as respondents. Results showed that the dominant learning style is Visual Learner having 37% of the total respondents. Hence, it implies that students understand and remember information, data, and concepts better using visual aids like images, diagrams, videos, etc. By allowing reflection time after lessons to visualize their work and harness their strengths.

Keywords: Learning Styles, Descriptive Research, Information Technology, Visual Learners, Auditory Learners

I. Introduction

A famous quote in the Philippines says the Youth is the hope of our motherland. This belief reflects the weight of responsibility the nation lays down on students. The learning that students acquire provides the foundation on which the realization of national goals can come to fruition. Furthermore, the idea leads to the understanding that the quality of learning is paramount in developing students as future leaders.

Studies have shown that learning styles play an essential role in developing student knowledge and skills (Aljaberi, N. M., 2015). The Learning style is the qualities and choices in the way

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individuals get and understand information, and it is dependent mainly on the learning preference of the learner himself. Brown and Etherington (2013) revealed a positive connection between learning styles and academic performance. However, learning styles are not stable; thus, students might utilize different techniques depending on their subject and learning environment (Alharbi et al., 2011).

Determining students' learning styles is vital to collecting data about their learning and academic preferences. The process creates awareness for the students. This realization provides the learner with the knowledge during his effort to learn and motivates the learner to use the gained knowledge (Federico 2000, as cited in Brown et al., 2009). Learning styles create consciousness for the students and can also remind them about their strengths and weaknesses. Being cognizant of their strengths and weaknesses triggers learners to be more motivated to learn (Coffield et al., 2004).

To clarify the subject, Fleming (2006) introduced four basic learning styles that will assist in understanding students learning inclinations. The VARK are four primary learning styles: visual, auditory, read/write, and kinesthetic. Each class has its characterization relying upon a students' capacity. The Visual students will, in general, learn by deduction utilizing media, for example, pictures, films, or diagrams. Learners who best assimilate and integrate data when introduced to them in a realistic portrayal of important images are known as visual students.

Auditory students internalize data effectively by tuning to music, conversation, or addressing. Auditory (or aural) students flourish whenever they are allowed the chance to hear information introduced to them vocally. More often, this type of learner maintains full attention to lectures instead of taking notes that educators can mistakenly describe as less engaged in class.

Reading/Writing students will generally learn by perusing notes or observing what they realize in reading which assists them to comprehend the subject. These learners exhibit a solid learning inclination for the written word. Reading/writing-oriented students must be motivated by teachers to take notes during classes to help their comprehension and knowledge on the subject richer.

The Kinesthetic students gain from development, impersonation, trial, and hands-on activity. Kinesthetic students are active, participatory students who need to play a genuinely dynamic function in the learning process to accomplish their best learning outcomes sometimes referred to as "tactile learners. Due to their dynamic nature, these students frequently have the most troublesome time in attaining success in conventional classroom settings.

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In the Philippines, the HEI's are keen on improving the quality of education, especially among Science and Technology students. The government recognizes the use of ICT for the country's socio-economic development. An example of this development plan is the Philippine ICT Roadmap. The end goal is to promote innovation and the constant evolution of ICT to pursue a progressive and secured nation. Furthermore, in facing the challenges of a new digitally advanced economy, the product of brilliant IT Professionals and highly skilled information technologists is a must to propel the growth of society and the communities.

Hence, discovering students' learning dispositions and attitudes toward their studies will be a basis for the University to design and implement educational interventions to enhance their academic performance and the quality of their learning experiences (Magulod Jr, G. C., 2019). Finally, the ideal trait among Educational Institutions offering a web-based education system is the ability of the University to ensure the learning of its students despite varied learning styles. We have to identify and recognize how students learn in achieving this objective. On this premise, the study deemed it necessary to disclose the learning styles that students possess to design appropriate curriculum programs that are responsive to the present needs of the learners.

II. METHODOLOGY

This chapter discusses the research method used in the study's conduct that answers specific questions posed under the problem statement. Further, it includes the research design, research locale, research instruments, validation of devices, data gathering procedure, and statistical tools employed to develop the data needed in the study.

Research Design

The researcher utilized a descriptive research design in the conduct of the study. Used a descriptive survey method to gather data from the respondents. The educational research method employed by the researchers in this study was descriptive survey method to be able to answer questions posed, that is, shedding light on the following:

- Visual Learner
- Auditory Learner
- Tactile Learner

Locale of the Study

At the Leyte Normal University, Tacloban City, the study was conducted.

Respondents of the Study

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The study respondents were students enrolled in BS Information Technology Students Last School Year 2019-2020. A total of 477 BSIT students responded to the survey.

Research Instruments

The main instrument used in this study was a survey questionnaire. The design of the questionnaire answers the demographic profile. And the students' learning styles. Part I of the survey questionnaire will elicit data on Age, sex, parent's source of income, geographic residence, type and frequency of internet access, and kind of high school graduate. Part II will gather information on the learning style of the student. The respondents were given enough time to think about the questions stated in the questionnaire, thus producing more accurate information.

Validation of Instruments

The researcher administered A pretested questionnaire to a sample population of students of other courses in Leyte Normal University who were not actual respondents to the study. The researcher distributed the questionnaire to the IT and Computer Education Unit faculty for their comments and suggestions and further improvements to the instrument. After a series of revisions, the researcher produced the final copy of the questionnaire. And ready for the distribution of the actual respondents of the study.

Data Gathering Procedure

The researcher underwent specific procedures in the completion of the study. Results of the survey were collated, tallied, tabulated, analyzed, and interpreted. The main instrument of data gathering is through the use of the questionnaire. The researcher determined and analyzed the survey results to identify the problem and solutions given by the respondents to come up with a good and effective solution.

Statistical Treatment of Data

Responses were tabulated, analyzed, and interpreted upon completing the gathering of data procedure.

We will use descriptive statistics such as percentage, frequency count, and rank. The presented formula below is. f P = x 100 N Where: P = is the percentage f = is the frequency N= total responses.

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III. Results and Discussion

Table 1.0 Profile (Age, Sex, and Year Level)

	Youth (15-24)				Adult (25-64)			
	Female		**Male**		**Female**		**Male**	
	f	**%**	**f**	**%**	**f**	**%**	**f**	**%**
First	82	17.19	**163**	**34.17**	1	0.20	**3**	**0.62**
Second	20	4.19	**44**	**9.22**	0	0	**2**	**0.41**
Third	32	6.71	**60**	**12.58**	4	0.84	**6**	**1.25**
Fourth	16	3.35	**27**	**5.66**	8	1.68	**9**	**1.88**

Table 1.0 presents the respondent's profile in terms of Age, Sex, and Year Level. The respondents' Age was categorized into two: Youth (whose age range is from 15 to 24) and Adult (whose age range is from 25 to 64). Results show that Male dominate in all the year levels among the Youth. There are 163 or 34.17% Males in the First YearLevel as compared to 82 or 17.19% Females; 44 or 9.22% Males in the Second Year Level as compared to 20 or 4.19% Females; 60 or 12.58% Males in the Third Year Level as compared to 32 or 6.71% Females; and 27 or 5.66% Males in the Fourth Year Level as compared to 16 or 3.35% Females.

Table 2: Parents Source of Income

CATEGORY	**PARENTS SOURCE OF INCOME**	
	F	**%**
Self Employed	141	29.56
Government Employee	104	21.80
Farmer	98	20.55
Private Company Employee	40	8.39
Seasonal Source of Income	33	6.92

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Drivers	17	3.56
House Helper	9	1.89
Vendors	9	1.89
Construction Worker	8	1.68
Store	6	1.26
Others	4	0.84
OFF	4	0.84
Security Guards	2	0.42
Butcher	2	0.42
TOTAL	477	100

The table above shows that most of the Parents Source of Income came from the Self Employed Category, consisting of 141 respondents or 29.56% of the total respondents, followed by Government employees with 21.80% or 104 respondents. The Farmer category got third place with a percentage of 20.55%, followed by private company employees with 40 respondents or equivalent to 8.39%. The seasonal source of income has 33 respondents or equals 6.92%, followed by the driver's category with 3.56% or 17 respondents. The following Categories house helper, vendors, construction workers, and the store got below 2%, and the remaining categories below 1% are others, security guards, OFW 's, and butcher categories.

Table 3: School Classification

School Classification		
	f	*%*
Public	363	76.10
Private	114	23.90
TOTAL	477	100.00

The table 3 finds that the majority of the students of LNU, particularly the BSIT program, come from public secondary schools with 76.10%, much higher than that 23.90% from private secondary schools. It also indicates that most of the students are choosing SUC's in the region because it is free tuition and quality higher education. Family word-related status is related to determining a private or government-funded school, with those with a high occupational rate

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more likely to choose a private school than those with lower levels of occupational status (Beavis, 2004).

Table 4: Type of Internet used by the students

Type of Internet		
	f	*%*
Home	88	18.45
Internet Café	40	8.39
Mobile Devices	230	48.22
Multiple Access	90	18.87
School Internet	29	6.08
TOTAL	477	100.00

Table 4 above indicates the type of Internet used by LNU students, specifically in the BSIT program. Based on the results, most of the students are using Mobile Devices with 48.22%. It indicates that most students use Mobile devices to access online classes and communication. It was followed by Multiple Devices with 18.87%, indicating that these students are using multiple devices like modem, home broadband, and other internet connection means, which is a small percentage. Home connection with 18.45% ranks third, and only 6.08% indicates that a small number of students are dependent on school internet connections.

Table 5: Frequency of Internet Access

Frequency of Internet Access		
	f	*%*
Always Everyday	215	45.07
Less Often	113	23.69
Never	1	0.21
Often (4 days a week)	148	31.03
TOTAL	477	100.00

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The table5 shows above that most students, based on the survey responses, say that 45.07% use internet access every day. It indicates that not all can open their respective devices every day due to reasonable reasons and other circumstances. It was followed by 31.03%, often with four days a week access to the internet connections. 23.69% was the result of the students who had less often critical to the internet connection, and only 0.21% never behaved access in internet connections per week. The results vary its indications due to different reasons of the students, especially on geographical locations and financial status. Internet use is thoroughly woven into a college student's life. Today's college student has grown up with early knowledge of, if not regular access to, the Internet (Jones, 2009).

Table 6.0 Learning Style Questionnaire Results

Learning Style Questionnaire	f		
	Often	Sometimes	Seldom
1. I recall best by listening to a lecture that includes information, explanations, and discussions.	198	267	12
2. I like to see information written on the board and supplemented by visual aids and assigned readings	245	219	13
3. I prefer to write things down or take notes for visual review	197	237	43
4. I like to use posters, models, or actual practice and other activities in class	187	252	38
5. I want explanations of diagrams, graphs, or visual directions	240	214	23
6. I like working with my hands or making things	235	23	219
7. I am an expert with and enjoy developing making graphs and charts	62	316	99

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Learning Style Questionnaire	f		
	Often	**Sometimes**	**Seldom**
8. I can identify if sounds match when presented with pairs of sounds	105	**330**	42
9. I can recall best by writing things down several times	195	247	35
10. I can easily comprehend and follow directions on a map	141	296	40
11. I do best in academic courses by listening to lectures and tapes	148	297	32
12. Inside my pocket, I play coins and keys	58	189	230
13. I figure out to spell better by repeating words out loud than by writing the words on paper	110	294	73
14. I can grasp a news thing better by learning about it in the paper or online rather than by paying attention to a report about it on the radio or Internet	110	297	70
15. while studying, I chew gum, smoke, or snack	38	102	**337**
16. I figure the most effective way to recall something is to picture it to me.	**263**	198	16
17. I say the spelling of words by "fingerspelling" them	48	251	178
18. I would prefer to listen to a good lecture or speech than read about the same material	194	259	24
19. I am an expert at working and solving jigsaw puzzles	79	298	100

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Learning Style Questionnaire	f		
	Often	Sometimes	Seldom
and mazes			
20. during learning periods, I grip objects in my hands.	86	255	136
21. I like to listen to the news on the radio or online rather than learning about it in a paper or on the Internet	119	305	53
22. I prefer obtaining information about an exciting subject by reading about it.	195	261	21
23. I feel delighted touching others, hugging, handshaking, etc.	105	261	111
24. I follow oral instructions better than written ones.	117	316	44

Table 6.0 shows the respondent's preferences based on the 24 questions given. From the responses under Often, the highest answer goes to question number 16 (*I figure the most effective way to recall something is to picture it to me.)* with 263 or 55.13%. Under Sometimes, the highest response goes to question number 8 (*I can tell if sounds match when presented with pairs of sounds*) got the highest response wherein it got 330 or 69.18%. Under Seldom, the highest answer is question number 15 (*I chew gum, smoke, or snack while studying*) with 337 or 70.65%.

Table 7.0. Visual Learners

Visual	Often (5 points)			Sometimes (3 points)			Seldom (1 moment)		
	f	%	f * 5	f	%	f * 3	f	%	f * 1
2. I like to see information written on	245	51.36	1,225	219	45.91	657	13	2.72	13

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Visual	Often (5 points)			Sometimes (3 points)			Seldom (1 moment)		
	f	%	f * 5	f	%	f * 3	f	%	f * 1
the board and supplemented by visual aids and assigned readings									
3. I prefer to write things down or take notes for visual review	197	41.30	985	237	49.68	711	43	9.01	43
7. I am an expert with and enjoy developing making graphs and charts	62	12.99	310	**316**	**66.24**	**948**	99	20.75	99
10. I can easily comprehend and follow directions on a map	141	29.56	705	296	62.05	888	40	8.38	40
14. I can grasp a news thing better by learning about it in the paper or online rather than by paying attention to a report about it on the radio or Internet	110	23.06	550	297	62.26	891	70	14.67	70
16. I figure the most effective way to recall	**263**	**55.14**	**1,315**	198	41.51	594	16	3.35	16

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Visual	Often (5 points)			Sometimes (3 points)			Seldom (1 moment)		
	f	%	f * 5	f	%	f * 3	f	%	f * 1
something is to picture it to me.									
19. I am an expert at working and solving jigsaw puzzles and mazes	79	16.56	395	298	62.47	894	**100**	**20.96**	**100**
22. I prefer obtaining information about an exciting subject by reading about it.	195	44.88	975	261	54.72	783	21	4.40	21
Visual Preference Score			**6,460**			**6,366**			**402**

Visual learners learn through seeing. These learners need to know the teacher's body language and facial expression to understand the lesson's content entirely. (LdPride, 2009). They remember best what they see, in pictures, diagrams, flow charts, timelines, films, and demonstrations (Yang, Hwang, & Yang, 2013). Table 7.0 shows the results of students' Learning Styles in terms of Visual Preference. Among the eight questions belonging to the Visual Learning Style, question number 16 (*I figure the most effective way to recall something is to picture it* to me.) got the highest response under the Often, wherein 263 or 55.14% of the respondents often use this learning style. UnderSometimes, question number 7 (*I am skillful with and enjoy developing making graphs and charts*) got the highest response wherein it got 316 or 66.24. Lastly, under Seldom, question number 19 (*I am good at working and solving jigsaw puzzles and mazes*) got 100 or 20.96%.

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Table 8.0. Auditory Learners

Auditory	Often (5 points)			Sometimes (3 points)			Seldom (1 topic)		
	f	%	f * 5	f	%	f * 3	f	%	f * 1
1. I recall best by listening to a lecture that includes information, explanations, and discussions.	198	41.50	990	267	55.97	801	12	2.52	12
5. I want explanations of diagrams, graphs, or visual directions	**240**	**50.31**	**1,200**	214	44.86	642	23	4.82	23
8. I can identify if sounds match when presented with pairs of sounds	105	22.01	525	**330**	**69.18**	**990**	42	8.80	42
11. I do best in academic courses by listening to lectures and tapes	148	31.03	740	297	62.26	891	32	6.71	32
13. I figure out to spell better by repeating words out loud than by writing the words on paper	110	23.06	550	294	61.63	882	**73**	**15.30**	**73**
18. I would prefer listening to a good lecture or speech than read about the same	194	40.67	970	259	54.30	777	24	5.03	24

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Auditory	Often (5 points)			Sometimes (3 points)			Seldom (1 topic)		
	f	%	f * 5	f	%	f * 3	f	%	f * 1
material									
21. I like to listen to the news on the radio or online rather than learning about it in a paper or on the Internet	119	24.95	595	305	63.94	915	53	11.11	53
24. I follow oral instructions better than written ones.	117	24.53	585	316	66.25	948	44	9.22	44
Auditory Preference Score			**6,155**			**6,846**			**303**

Auditory learners learn through listening. They learn best through conversation, addresses, paying attention to what others need to say, and talking things through. These individuals discover information through listening and interpreting data through pitch, emphasis, and speed (LdPride, 2009). Table 8.0 shows the results of students' Learning Styles in terms of Auditory Preference. Among the eight questions belonging to the Auditory Learning Style, question number 5 (*I require explanations of diagrams, graphs, or visual directions*) got the highest response, with 240 or 50.31%. Under Sometimes, question number 8 (*I can tell if sounds match when presented with pairs of sounds*) got the highest response wherein it got 330 or 69.18%. Lastly, question number 13 (*I learned to spell better by repeating words out loud than by writing the words on paper*) under Seldom got 73 or 15.30%.

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Table 9.0. Tactile Learners

Tactile	Often (5 points)			Sometimes (3 points)			Seldom (1 topic)		
	f	%	f * 5	f	%	f * 3	f	%	f * 1
4. I like to use posters, models, or actual practice and other activities in class	187	39.20	935	252	52.83	756	38	7.97	38
6. I like working with my hands or making things	**235**	**49.27**	**1,175**	23	4.82	69	219	45.91	219
9. I can recall best by writing things down several times	195	40.88	975	247	51.78	741	35	7.34	35
12. Inside my pocket, I play coins and keys	58	12.16	290	189	39.62	567	230	48.22	230
15. while studying, I chew gum, smoke, or snack	38	7.97	190	102	21.38	306	**337**	**70.65**	**337**
17. I say the spelling of words by "fingerspelling" them	48	10.06	240	251	52.62	753	178	37.32	178
20. during learning periods, I grip objects in	86	18.03	430	255	53.46	765	136	28.51	136

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Tactile	Often (5 points)			Sometimes (3 points)			Seldom (1 topic)		
	f	%	f * 5	f	%	f * 3	f	%	f * 1
my hands.									
23. I feel delighted touching others, hugging, handshaking, etc.	105	22.01	525	**261**	**54.72**	**783**	111	23.27	111
Tactile Preference Score			**4,760**			**4,740**			**1,284**

Tactile or Kinesthetic Learners learn through moving, doing, and touching actions. They acquire and understand new information best by using their hands and actively exploring the physical world around them (LdPride, 2009). Table 9.0 shows the results of students' Learning Styles in terms of Tactile Preference. Among the eight questions belonging in the Tactile Learning Style, under Often, question number 6 (*I like working with my hands or making things*) got the highest response wherein 235 or 49.27% of the respondents often use this learning style. Under sometimes, the highest answer goes to question number 23 (*I feel very comfortable touching others, hugging, handshaking, etc.*) with261 or 54.72%. Lastly, under Seldom, the highest response goes to question number 15 (*I chew gum, smoke, or snack while studying*) with337 or 70.65.

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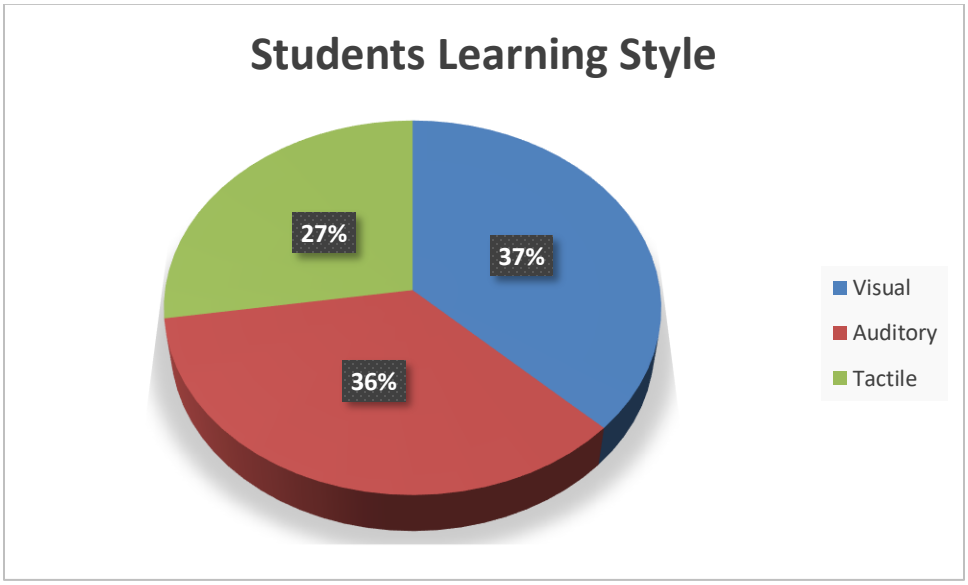

Figure 1. Students Learning Style

Figure 3 shows the distribution of the different learning styles of students. Among the three, Visual was the dominant learning style of students, and Tactile was the most miniature learning style used by students. Thus, it suggests that most BSIT students understand and remember information, data, and concepts better when they read. The study of Veena and Shastri (2013), Magulod (2019), and Alkooheji and Al-Hattami (2018) supported the findings, wherein the results show that BS Information Technology students learn best through visual learning.

In the study conducted byNorwawi et al.(2009, October) among computer science students, results show that students who achieved good grades are visual, sensing, and active learners. These active learners prefer an environment that enables them to learn using the knowledge, such as writing programs or discussing material with their peers.

IV. Conclusion

Based on the findings, it is a reality that students have varying learning styles, and one may be visual, auditory, tactile, or multiple learning styles. Thus, to learn more efficiently, students need to become familiar with various methods of studying, learning, and remembering new information. Having multiple learning styles or preferences, students may have the ability to learn quickly and at a deeper level will be more successful.

V. Recommendation

About the conclusion drawn, the researchers formulated the following recommendations:

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1. The faculty must develop teaching strategies consistent with the student's unique learning styles to increase academic performance.
2. Incorporating more in-class activities and discussions may facilitate participant learning, thus impacting academic performance positively.
3. Create a convenient environment for students and include them in formulating the curriculum design.

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