

Preferred Teaching Delivery Methods for Generation Z

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This paper is an empirical study of Generation Z undergraduate business students (n=227) from a small liberal arts and a R1 University in the Midwest. The research question included an exploration of the students' e-learning and technology adoption, and communication preferences, with professors to facilitate their e-learning. Several e-learning techniques were examined to determine student preference. Studies have shown that Generation Z students have a very short attention span and increasingly use online sources to access information (Sparks et al., 2017; Purcell et al., 2012). However, the same students indicated they preferred using the physical textbooks and favored working alone.

Keywords: Generation Z, e-learning, group work, student learning preference

INTRODUCTION

Generation Z students born after 1996 (Parker & Igielnik, 2020) may have different learning preferences in comparison to earlier generations (Nicholas, 2020; Sparks & Honey, 2017). Technology can impact the way students learn and interact with each other in and out of the classroom. Students present with opposition to group work (Sparks & Honey, 2017). Sparks and Honey (2017) noted that students preferred to learn on their own and did not like to work in groups, confirming this study's findings that the majority preferred working on their own (71.4%). Further, when students were placed in groups/teams, some students would not sit at the group table but instead would remain at their desk and work with their group a few feet away using electronic document sharing technology like Google docs (Sparks & Honey, 2017).

The purpose of this research study is to follow up on Nicholas (2020), who studied student learning preferences in a liberal arts university. The inference is that Generation Z students prefer to go online rather than interact physically with their peers (Hampton, Welsh, & Wiggins, 2020). Consequently, the onus is on the educator to adjust the teaching pedagogy to align with the current needs and cultural shifts (Hampton et al., 2020; Nicholas, 2020).

THEORETICAL FRAMEWORK

A behavioral model of teaching refers to techniques that focus on student behavior and endeavor control (Brophy, 1999). Social constructive and cognitive load theories also highlight a student's interest level in learning, their preferred style of learning, and the necessity for the student to be at the center of the learning process (Bishop & Verleger, 2013). The behavior model of teaching is consistent with the traditional method of teaching (Brophy, 1999). However, the social constructive and cognitive load theories encourage teachers to adopt a more student-centered approach whereby they are the *de facto* facilitators rather than a transmitter of information (Bishop & Verleger, 2013; Singh, 2020). Cognitive load theory builds on the foundation of prior learner knowledge, learner outcomes, and the setting that facilitates the learner (Kirschner, Sweller, & Clark, 2006). Though the student lecture approach is investigated in this study, the traditional method lacks the consideration for the student to think and engage critically.

LITERATURE REVIEW

Compared to other demographic segments, Generation Z's communication and learning styles are significantly more technically connected (Nicholas, 2020). As digital natives, Generation Z or i-Generation (Rosen, 2011) have been using simulations and online Learning Management Systems (LMS) such as Brightspace Desire2Learn (D2L), Moodle, Canvas, Blackboard, and similar methods (Shorey, Chan, Rajendran, & Ang, 2021). Attending a classroom where none of the technology is implemented can be counterproductive. Muñoz-Escalona et al. (2020) argued the motivations and engagement of student learning should continuously be evaluated. The onus is now on teachers to learn Generation Z's preferred style of learning (Muñoz-Escalona et al., 2020; Shorey et al., 2021).

Technology is second nature to this generation, and it is paramount to breathing. Rosen (2011) stated the phone is a portable computer. When defining e-learning tools, students define them as accessible, fast, and easy to use (Muñoz-Escalona et al., 2020). In contrast, the struggles with e-learning tools involve internet dependency, impersonal, and often confusing material (Muñoz-Escalona et al., 2020). Having been besieged with e-learning technology, such as smart boards, lightboards, webinars, YouTube, and so on, played some part in their short attention span (Nicholas, 2020). Educators can look to new and unique teaching strategies, such as agile and scrum techniques (Pócsová et al., 2020), gamification (Saxena & Mishra, 2021), and simulation-based learning (Shorey et al., 2021) as a way to engage this generation.

Purcell et al. (2012) showed that Generation Z preferred the method of learning via YouTube and had more daily visits (72%) than other generations. The intrapersonal learning preference aligns with the growing preference for video-based and applied learning strategies (Seemiller & Grace, 2016). Seemiller and Grace (2019) highlighted these video-based learning strategies, connected to real-world issues or experiences, aligned with Generation Z's preferences. Despite a growing demand for e-learning tools, Muñoz-Escalona et al. (2020) found that 80% of students (N=180) preferred a face-to-face delivery mechanism.

Characteristically, Generation Z students possess compassion, determination, loyalty, open-mindedness, responsibility, and thoughtfulness (Seemiller & Grace, 2016). Interestingly, this Generation does not favor creativity (Nagal, 2013). Quite the opposite, they want step-by-step directions (Nagal, 2013). Creativity may not be practiced in high school, so when the student goes to college, they do not expect to be innovative or creative. Generation Z students are not favorable to abstract projects provided in class (Nagal, 2013). The instructors today should provide clear directions and a sample to follow. Though some may be aghast at this revelation, it may be relevant to note that Google provides samples for almost anything anyone needs to complete. Since Generation Z students are digital natives, it stands to reason that they may want examples.

Nicholas (2020) research found that most of the respondents did not believe recorded lectures were helpful in learning the material (67.1%). Singh (2020) found that flipped classrooms embracing micro-lecture and active learning styles were less likely to fail modules than traditional lecture classroom formats.

In contrast, Ascione (2019) found YouTube, by far, was the preferred method of learning compared to lectures, application learning, books, and in-person teamwork.

Generation Z no doubt has comparatively high skill levels when it comes to navigating computers, the internet, and by extension, new technology. Given that they have such a short attention span, as alluded to in the aforementioned, different techniques in delivery methodology are imperative to garner their attention. Reyes-Santias (2021) highlighted one technique of short movie clips in teaching business management; however, the instructor should be judicious about explaining the concept clearly. One strategy would be to remind students of the concept analogous to a particular scene in the film (Reyes-Santias, 2021). Based on the assumption that Generation Z does not have any real-world business experience, some topic concepts should be delineated to ensure complete comprehension of the link between the movie scenes and the business concepts (Reyes-Santias, 2021). Reyes-Santias (2021) revealed that student's ranked higher satisfaction and obvious relatability to protagonists they identified with. There is a suggestion that the films should be more favorable to their age, thus allowing them to choose the film (Reyes-Santias, 2021).

It appears that incorporating agile and scrum techniques (Pócsová et al., 2020), flipped classrooms (Singh, 2020), gamification (Saxena & Mishra, 2021), micro-lectures (Singh, 2020), movies (Reyes-Santias, 2021), and simulation-based learning (Shorey et al., 2021) in the curriculum allows students to develop specific skills and improves academic results. There is also the development of general competencies such as synthesis, communication, and analysis skills imperative in business success.

METHODOLOGY

The study used a mixed-method research method with a population sample including Business and Medical students (N=227) from two public Universities in Minnesota. As an ethical assurance, the IRB reviewed the survey before solicitation. Participants were invited to voluntarily participate in the Qualtrics online survey sent to them via their student email. The 32-question survey addressed questions relating to their preferred learning delivery method. The URL to the online survey was active from March 2022 to April 2022.

For deeper data evaluation in the dependent variable variations, the independent variables were manipulated without including other variables such as demographics. Crosstab Bonferroni correction was used to evaluate whether the type of learner and the difference in the type of teaching method preferred had any significant relationship. The sample used self-identified Generation Z students born between 1996 and 2012 (Parker & Igielnik, 2020). The option was whether student learners were likely to select teaching methods that complemented their learner type.

One of the primary assumptions of the study is that the business students from these Universities provide a representation of business students across the United States. Further assumptions were made regarding the data and analysis itself, where the models were examined to ensure no multivariate normality and the homoscedasticity of variance (Cozby & Bates, 2018). One of the study's primary limitations was that this was a new survey combining questions used in another research. These questions did exist in other surveys but were not combined until this study. The use of the online survey can produce some limitations regarding access, use, completion, and reliability of data answers. While online surveys are a cost-effective method for distributing the survey, it also presents limitations in survey completion through email solicitation. An additional limitation is that the participant may not feel comfortable completing all of the survey questions. Through maintaining confidentiality, the participant was not required to answer all of the questions to minimize this fear.

FINDINGS

Students were asked what types of devices they primarily use to access e-learning tools and what type of device they primarily use to get information.

R1: The explorations of Generation Z students' e-learning and the technology adoption and the communication preferences with professors to facilitate their e-learning.

H1: The primary technology that Generation Z students' use to obtain general information is related to the primary technology that students use for e-learning.

H1 is supported. The primary technology that students use to seek general information is related to the technology that they may adopt for e-learning ($\chi^2(12) = 164.49$, $p < .01$, $n = 221$). Table 1 highlights that students who use computers as their primary device for obtaining overall information are also likely to use computers for e-learning (57.6%) compared with phones (41.2%). A Bonferroni correction is thus conducted to protect from a Type I Error. The new p-value is the alpha-value ($\alpha_{\text{original}} = .05$) divided by the number of comparisons (i.e., 4×5): $\alpha_{\text{altered}} = .05/20 = .0025$. The p-value must be $p < .0025$ to determine if any of these 20 correlations are statistically significant. Similar consistent patterns of using the technology for these two purposes also appear for phones (93.3%, $p = .00011$) and tablets (50%, $p < .00001$) as well. Interestingly, 6.7% of students who use computers to seek general information are also likely to use phones as a tool for e-learning ($p = .0002$).

TABLE 1
CROSSTAB BONFERRONI CORRECTION RESULTS

What type of device do you primarily use to access e-learning tools?						
Seeking information device type	Computer	Phone	Tablet	Other(s)	Don't use	Total
Computer						
Count	102	1	0	0	14	117
Expected Count	93.7	7.9	1.1	1.1	13.2	117
% within E-Learning device type	57.6%	6.7%	0.0%	0.0%	56.0%	52.9%
Adjusted Residual	2.8	-3.7	-1.5	-1.5	0.3	
Adjusted p-value	0.0051	0.0002	0.1319	0.1319	0.7449	
Phone						
Count	73	14	0	2	11	100
Expected Count	80.1	6.8	0.9	0.9	11.3	100
% within E-Learning device type	41.2%	93.3%	0.0%	100%	44.0%	45.2%
Adjusted Residual	-2.4	3.9	-1.3	-1.6	-0.1	
Adjusted p-value	0.0164	0.0001	0.1965	0.1181	0.8940	
Tablet						
Count	0	0	1	0	0	1
Expected Count	0.8	0.1	0.0	0.0	0.1	1.0
% within E-Learning device type	0.0%	0.0%	50.0%	0.0%	0.0%	0.5%
Adjusted Residual	-2.0	-0.3	10.5	-0.1	-0.4	
Adjusted p-value	0.0444	0.7868	0.0000	0.9237	0.7204	
Other						
Count	2	0	1	0	0	3
Expected Count	2.4	0.2	0.0	0.0	0.3	3.0
% within E-Learning device	1.1%	0.0%	50.0%	0.0%	0.0%	1.4%
Adjusted Residual	-0.6	-0.5	6.0	-0.2	-0.6	
Adjusted p-value	0.5577	0.6379	0.0000	0.8676	0.5334	

In determining the level of e-learning tools awareness and the primary technology students use for learning, the following hypothesis was used:

H2a: The primary technology Generation Z students use for e-learning is related to their awareness of e-learning tools.

H2a is supported. The technology that students may use for e-learning is related to their awareness of e-learning tools ($\chi^2(4) = 128.51, p < .01, n = 222$). Specifically, 90.4% of those who know what e-learning tools are, primarily adopted computers to access e-learning compared with phones (7%) and tablets (1.1%). Additionally, 65.7% of those who do not know what e-learning tools are, do not use any e-learning tools either.

To explore whether they were knowledgeable in using e-learning tools and whether that had an impact on the e-learning tools used, the following hypothesis was tested:

H2b: *The primary technology that Generation Z students use for e-learning is related to their knowledge of e-learning tools.*

H2b is supported. The technology that students may use for e-learning is related to their knowledge of e-learning tools ($\chi^2(4) = 51.12, p < .01, n = 211$). Specifically, 89.2% of those who believe they are knowledgeable about e-learning tools primarily use computers to access e-learning compared with phones (8.2%) and tablets (1.3%). Although 32.1% of those who do not think they are knowledgeable about e-learning tools do not adopt any e-learning tools either, 64.2% of such students still claim that they somewhat use computers to access to e-learning.

To determine students' communication preference with their professors, the following hypotheses was tested:

H3: *Generation Z students preferred communication methods with the professors is related to their knowledge of tools for e-learning.*

H3 is supported. The students' preference of communication methods with the professors is related to their knowledge of different types of e-learning tools ($\chi^2(5) = 11.43, p < .05, n = 212$). Specifically, 72.2% of those who believe they are knowledgeable in using e-learning tools prefer to receive communications from their professors by email compared with face-to-face (20.9%) and social media (1.2%). However, 63% of students who do not think they are knowledgeable in using e-learning tools still prefer to communicate with their professors using email, compared with face-to-face (31.5%) and social media (5.6%).

A majority of students favored accessing Google (92%) for assistance in learning a concept compared to other sources. Interestingly respondents who identified as tactile learners were more likely to use Google (78%) than YouTube (35%), indicating that they trusted Google to assist them in learning theoretical concepts. Again, Google (77%) was the preferred choice for seeking solutions to questions.

The results showed that most students identified as Tactile (37%), followed by auditory and visual (26%). The remaining respondents indicated that they learned best through observation (20%), Visual only (14%), and Auditory only (3%). These findings suggest that educators should consider designing pedagogy with a combination of lecture and experiential exercises; teaching through demonstration.

As mentioned earlier, students prefer to work alone (71%) rather than work in teams. However, preparing students to work in the real world requires a favored teamwork disposition. The onus is on instructors to encourage students' engagement and preference when working in teams. Pócsová et al. (2020) extended implementing an agile practice within teaching through scrum practices can help encourage students to work together through practical experiences. Singh (2020) explained using a flipped classroom can foster self-organization while working on a problem. Together, these iterative approaches can encourage individuals, and by extension, teams, to reflect on wins/losses through reflection while seeking to improve continuously.

Of the students who responded (N=218) on a scale of 1-10 whether they thought they were engaged in their classes. The results showed that they were relatively engaged ($M=6.89, SD 2.14$). They mostly preferred theories applicable to the real-world (87%), and they wanted immediate feedback (94.7%) on their work. Interestingly, participants preferred correspondence from their instructor via email (69.6%) followed by face-to-face (22.9%). When asked to provide a single word to describe online learning, students

(N=177) came up with 77 different words. Figure 1 provides a word cloud to demonstrate which words were used the most, including easy (N=16), difficult (N=15), challenging (N=13), flexible (N=13), and convenient (N=10).

FIGURE 1
WORD CLOUD FOR A SINGLE WORD DESCRIBING ONLINE LEARNING



Gloekler and Lucas (2021) looked at student preferences for digital or physical textbook use and testing preferences. Similar to their study, the participants in this survey preferred a physical textbook (64.8%) compared to an e-text (33.9%) and, if given a choice, would prefer to have all their exams taken online (63.9%) compared to paper and pencil (26.4%) or oral (8.4%).

Hampton et al. (2020) evaluated the preferences for teaching methods. Similarly, in our study, when looking at ranking preferred teaching methods (N=215), where 1 = highest preference and 13 = least preferred, lectures with audience response/interaction took the top two rankings (N=40 ranking 1, N=30 ranking 2), whereas video or audio-enhanced PowerPoint presentations ranked third (N=29) and case studies ranked fourth (N=28) and fifth (N=27). Table 2 highlights the individual rankings for each preferred teaching method.

TABLE 2
RANKING OF PREFERRED TEACHING METHOD

Teaching Method	Ranking												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Assigned reading from text	23	22	20	13	14	8	15	12	16	12	14	25	21
Assigned readings from journals or other sources	7	16	17	16	16	20	15	16	11	18	18	25	20
Blogs	2	4	10	9	17	10	19	24	20	23	32	16	29
Case Studies	11	21	25	28	27	16	18	15	18	12	9	8	7
Games	37	26	21	18	16	20	13	10	13	15	11	8	7
Group collaborative projects	7	9	10	21	19	26	15	16	15	14	17	22	24
Group problem solving exercises	6	13	20	25	16	19	23	16	20	9	11	28	9
Internet searches	5	7	19	16	15	21	27	25	23	21	11	14	11
Lecture	20	16	17	12	18	20	14	15	11	25	21	13	13
Lecture with audience response/interaction	40	30	11	19	17	10	13	15	21	18	11	7	3
Quizzes/tests	7	6	10	12	12	9	18	26	13	19	26	21	36
Simulations	23	23	6	10	13	21	16	11	22	20	20	12	18
Video or audio enhanced PowerPoint presentations	27	22	29	16	15	9	14	12	9	14	16	17	

CONCLUSION

Generation Z students have different learning preferences in comparison to earlier generations. The purpose of this research study was to explore Generation Z students' e-learning and technology adoption and their communication preferences with professors to facilitate their e-learning. Three hypotheses were tested within the study, and the data supported all three. The study supports the findings that the primary technology that students use to seek general information is related to the technology that they may adopt for e-learning. It also supports that the technology that students use for e-learning is related to their awareness and knowledge of e-learning tools. Furthermore, the study supports the students' preference of communication methods with the professors related to their knowledge about different types of e-learning tools. The results of this study support the findings of other scholars' work (Hampton et al., 2020; Nicholas, 2020). As a takeaway from the study, while technology can impact the way students learn and interact with each other in and out of the classroom, Generation Z students still have a prevailing preference for physical textbooks. Students prefer online exams but have mixed feelings regarding how they would describe the online learning experience.

Our recommendation for future research is to investigate further teaching pedagogical practices to better align with Generation Z students' needs and cultural expectations. Further research is also needed to inform pedagogy to engage Generation Z students in their educational experience effectively, both individually and on a group/team basis. Finally, additional research may be needed to examine the mixed experiences of students regarding online learning.

ENDNOTES

1. Table 1. Crosstab Bonferroni correction evaluating technology used to obtain information as related to technology and for e-learning.
2. Table 2. (n=215) Identifies the number of students ranking a particular teaching method at a given level.

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