

Original Article

Exploring Digital Intelligence Among Generation Z Learners in Senior High Schools in the City of Makati: Basis for an E-Ready Faculty Development Program

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Abstract: In the 21st century, teachers will have to evolve from the primary role as a dispenser of information to orchestrator of learning and helping students turn information into knowledge, and knowledge into wisdom. This is far from the concept of teaching some ten years ago where classrooms are teacher-centered. This study made use of the descriptive method of research. Documentary analysis was employed with the use of students and teachers' records. Anecdotal review was conducted to reinforce the researcher's personal observations. Survey was conducted in gathering of data on learning styles, on multiple intelligences and an online test for digital literacy. Observations and anecdotal reports on their surprising level of adeptness on how technology is utilized by these cohorts, mostly for entertainment, even at a very young age, were supported and affirmed by many. The researcher initially believed that this was digital intelligence. However, in the course of the study and voluminous literature review, this unusual exhibition of digital skill is found to be just a manifestation of digital literacy and is only a part of a multifaceted structure of skills-set, capabilities, and competencies which build-up digital intelligence (DQ). Digital Technology can be considered a double-edged sword. As it brings immeasurable benefits to people's lives, it can also cause massive threats and risks to personal safety and security if not utilized intelligently. It is only through a set of critical digital abilities that will guide and enable individuals to face the challenges of the digital age. This set of timeless skills is called digital intelligence. As digital skills can be learned, digital intelligence can also be developed. It is never enough that one is adept in using technology. One must also be prepared to use technology, intelligently. Gen Z learners' skills with technology or their level of digital literacy are part of who they are as digital natives. The generational gaps between students and teachers can affect the perception of how students utilize technology, how they learn, how people behave and how teachers may intervene to prepare students to be digitally intelligent (DQ).

Keywords: exploring, digital intelligence, generation z learners, senior high schools

1. INTRODUCTION

In the 21st century, teachers will have to evolve from the primary role as a dispenser of information to orchestrator of learning and helping students turn information into knowledge, and knowledge into wisdom [1]. This is far from the concept of teaching some ten years ago where classrooms are teacher-centered. The Fourth Industrial Revolution (FIR) otherwise described as the Age of Digitalization spawned an even bigger challenge for teachers to rethink about the definition of education and their role in the classroom. The technological advancement has created gaps between the creation of new information and knowledge and what is being delivered in schools through education [2]. The media of

transferring information have also evolved immensely with everyone getting more and more dependent on the use of the internet, the machines and the artificial intelligence (AI) in learning. The Fourth Industrial Revolution, finally, will change not only what we do but also who we are. It will affect our identity and all the issues associated with it: our sense of privacy, our notions of ownership, our consumption patterns, the time we devote to work and leisure, and how we develop our careers, cultivate our skills, meet people, and nurture relationships [3]. As globalization and rapid advancements in technology continue to transform civic space and the world of work, education systems have grown increasingly disconnected from the realities and needs of global economies and societies. Education models must adapt to equip children with the skills to create a more inclusive, cohesive and productive world [4]. With the radical technological advancement brought about by the FIR, it has created change on how people define things and process information brought about by people's more apparent need for technology. This is very prevalent to how the current generation of students, Generation Z, seamlessly integrate technology into their lives including learning. Significant changes on the demographical characteristics of students and their learning characteristics have become observable and are creating more challenges to how students learn. The recent Global Pandemic brought about by the threat of the Corona Virus has killed thousands of lives in the different parts of the world including the Philippines, has infected more than 1.11 million people, and killed more than 18,000 people as of May 11, 2021 (doh.gov.ph). These numbers are still growing each day. This has affected all aspects of people's lives including education. Placing the country under the Expanded Community Quarantine (ECQ) in mid-March, 2020 resulted in closing all schools. Students' learning stopped in some schools, while others have resorted to on-line learning to continue the process. With students' exposure to technology, it can be inferred that students were able to adapt and respond to the change brought about by the situation. With the continuation of the Pandemic, authorities believe that the threat of the virus shall remain even after the ECQ is lifted and with this, people shall have to adapt to the "new normal" including the prevalence of technology-aided learning [5]. It may be underscored that the Learning Framework in the 21st century has created implications on curriculum and instruction, standards and assessment, professional development and learning environments. Curriculum and instruction evolved from content-focus and teacher-centered classroom approaches to a more skills-based and student-centered classroom that ensures student engagement based on relevance and authenticity to real life. The 21st century requires knowledge generation, not just information delivery. Schools in the 21st Century aim for engaging students in addressing real-world problems, issues important to humanity and questions that matter [6]. With the ultimate goal to make students develop timeless essential skills needed to thrive in the 21st century, the teacher's way of gauging and assessing learning will have to be complementary. 21st century Learning challenges teachers to develop strategies to reach diverse students, support differentiated teaching and learning and utilize multiple measures of mastery. 21st century Learning is holistic, globalized, integrated, inter-disciplinary and project-based (Partnership in 21st Century, 2010). Thus, there is an urgent need to update education systems to equip children with the skills to navigate the future of work and the future of societies. The Education 4.0 framework provides a vision on how school systems can be updated to deliver children's future needs. This transformation calls for shifts in learning content to include both the technical and human-centric skills needed to build growing and inclusive economies and societies and shifts in learning experiences that more closely mirror the future of work [7]. In recent years, research about teacher training programs and student-centered classrooms have become increasingly relevant. Teachers must be trained to master various aspects in the learning process so that the learning outcomes are in accordance with the learning objectives. These processes of learning involve human's thinking skill, analytical skill, and application practices which equate the three learning areas theorized in the field of education. Teachers are expected to impact on the cognitive, affective, and psychomotor dimensions of learning among students. Professional development is important because education is

an ever-growing, ever-changing field. This means that teachers must be lifelong learners in order to teach each new group of students. Professional development not only allows teachers to learn new teaching styles, techniques, and tips, but also interact with educators from other areas in order to improve their own teaching. Ongoing professional development is critical for teachers who wish to be great at their jobs and offer the best to their students each day [8]. With the evolving educational landscape, it is now imperative for teachers to undergo appropriate training and development program that will assist and prepare them to perform their roles effectively and efficiently. This training does not refer to their degree or educational qualifications, but the training and development program which schools provide through their Faculty Development Plans. The training they should undergo must address their needs to be able to engage with their students successfully based on how students learn nowadays due to the impacts and requirements of the new normal, the FIR and the principles of 21st century education. The study attempted to explore the characteristics of Gen Z learners that are associated with “digital intelligence” among senior high school (SHS) students and their teachers in four school segments in the Schools Division City of Makati.

2. MATERIALS AND METHODS

This study made use of the descriptive method of research. It was the most appropriate method to use since the behavior and learning characteristics of the Generation Z learners was observed, recorded, described and analyzed in this study. Mixed method of research was used for this study. Documentary analysis was employed with the use of students and teachers’ records. Anecdotal review was conducted to reinforce the researcher’s personal observations. Survey was conducted in gathering of data on learning styles, on multiple intelligences and an online test for digital literacy. Responses were subjected to data analysis and results were interpreted. Interviews and focus group discussions were undertaken to substantiate the quantitative data gathered from the different instruments. Due to the limitations set by distance learning at this time of the pandemic, observations were not utilized in the study. The study was conducted in four (4) private schools representing different school segments such as: Global City Innovative College (GIC), representing a Hybrid Private SHS, with address at Petplans Tower Building, 444 EDSA Makati; Colegio San Agustin (CSA), representing a Private Catholic SHS, located at Palm Ave, Dasmariñas, Makati, Metro Manila; Makati Science High School (MSHS), representing a Public Science SHS, located at 9 Kalayaan Ave, Makati, 1214 Metro Manila and Makati High School (MHS), representing a Regular Public SHS, with address at General Luna, Makati, 1210 Metro Manila. These schools were identified being located within the same Division of Makati and are offering Senior High School programs. Furthermore, GIC was selected being the researcher’s place of work. These school segments were also selected based on the nature of their curriculum which can provide a more diverse response and data for the study. The study considered four (4) schools in the City of Makati. These school segments were selected based on the nature of their curriculum. The study employed stratified random sampling technique in the identification of student-respondents, and a 100% or take all for the teacher-respondents. Further, all the teachers teaching in the Senior High School program under study were included with the total population of one hundred and three (103). To determine the sample size, Slovin’s formula was used.

The computation is as follows:

$$n = \frac{N}{1 + Ne^2}$$

Student-repondents' Sample Size:

$$n = \frac{2,270}{1 + 2,270 (.05)^2}$$

$$n = \frac{2,270}{6.675}$$

Where:

n – is the sample size

N – total population

$$n = 340.07$$

The sample size for the student-respondents per strata is computed as shown below:

Table 01: Population and Sample Size of Student-Respondents

STRATA	STUDENT POPULATION	p	(n) (p)	ACTUAL n
(SCHOOL A) GCIC	71	0.031	340 (0.031)	10.54 or 11
(SCHOOL B) CSA	600	0.264	340 (0.264)	89.76 or 90
(SCHOOL C) MSHS	410	0.18	340 (0.180)	61.2 or 61
(SCHOOL D) MHS	1,189	0.524	340 (0.524)	178.16 or 178
	2,270		TOTAL	340

Table 02: Population and Sample Size of Teacher-Respondents

STRATA	TEACHERS POPULATION
(SCHOOL A) GCIC	14
(SCHOOL B) CSA	39
(SCHOOL C) MSHS	10
(SCHOOL D) MHS	40
	103

The study utilized a combination of survey instruments and online tests which were utilized as bases in gathering the data to determine manifestations of “digital intelligence” among Gen Z learners. The three (3) instruments included the following: a (1) The Survey Questionnaire on Student’s Learning Style for Students (2) The Survey Questionnaire on Student’s Learning Style for Teachers, and (3) An Online Test on Digital Literacy created by Northstar Digital Literacy of Canada.

Table 03: Reliability Analysis on the Survey Questionnaire on Student’s Learning Style

Variables	No. of Items	Cronbach’s Alpha	Interpretation
Social Dimension	10	.722	Acceptable
Mobile Dimension	10	.712	Acceptable

Global Dimension	10	.841	Good
Digital Dimension	10	.858	Good
Visual Dimension	10	.837	Good
Mean Reliability		.794	Acceptable

Upon approval of the dissertation proposal, the researcher instruments were subjected to validity and reliability procedures. Once found to be valid and reliable, the questionnaires were converted to Google Forms for easy administration of the online survey at this time of the pandemic where students are not allowed to report to school physically.

Table 04: Interpretation on Academic Achievement in Terms of GWA

RANGE OF VALUE	VERBAL INTERPRETATION	CODES
90% and above	OUTSTANDING	O
89%-85%	VERY SATISFACTORY	VS
84%-80%	SATISFACTORY	S
79%-75%	FAIRLY SATISFACTORY	FS
74% and below	DID NOT MEET EXPECTATIONS	DME

Frequency and Percentage were used to describe the profile of senior high school respondents in terms of age, sex, school segment, strand, year level, and socio-economic status. Likewise, the same tools were utilized to describe the profile of teachers in terms of age, sex, degree earned, school segment, subject taught and years of teaching experience. Mean and Standard Deviation were used to describe the profile of students in terms of academic achievement as measured by their GWA in English, Mathematics and Science. Moreover, the same were utilized to describe the responses of respondents on the assessment of Digital Learning Dimension based on Ashley McKenzie's categorization and the level of students and teachers' digital literacy as measured by Northstar Digital Literacy Online Test. To determine the level of learning style of Gen Z learners, the researcher arbitrarily developed a table of interpretation as presented below:

Table 05: Interpretation to Determine Level of Learning Style

SCALE	RESPONSE	RANGE OF VALUE	INTERPRETATION	DESCRIPTIVE VALUE
4	Always Manifested	3.26 – 4.00	Very High Level (VHL)	90% to 100% of the time manifested
3	Frequently Manifested	2.51 – 3.25	High Level (HL)	70% to 89% of the time manifested
2	Sometimes manifested	1.76 – 2.50	Low Level (LL)	50% to 69% of the time manifested
1	Not at all Manifested	1.00 – 1.75	Very Low Level (VLL)	Less than 50% of the time manifested

Finally, the standard deviation was utilized to describe the spread of scores closely or away from the mean scores. The small value of standard deviation indicates homogeneous result while large value indicates heterogeneous result. T-Test of Independent Samples was employed to calculate the significant differences in the assessment of the two groups of respondents on the Digital Learning Dimension based on Ashley McKenzie's categorization. Paired T-Test was used to find the differences

in the level of students and teachers' digital literacy as measured by Northstar Digital Literacy Online Test.

3. RESULTS AND DISCUSSION

Table 06: Distribution of Student-Respondents by Age

Age	School A		School B		School C		School D		Overall	
	f	%	f	%	f	%	f	%	F	%
16	0	0.0	26	29.0	13	21.0	31	17.0	70	21.0
17	5	45.0	26	29.0	22	36.0	71	40.0	124	36.0
18	4	36.0	31	34.0	16	26.0	50	28.0	101	30.0
Others	2	18.0	7	8.0	10	16.0	26	15.0	45	13.0
Total	11	100.0	90	100.0	61	100.0	178	100.0	340	100.0

Table 07: Distribution of Student-Respondents by Sex

Sex	School A		School B		School C		School D		Overall	
	F	%	f	%	f	%	f	%	F	%
Male	2	18.0	32	36.0	20	33.0	61	34.0	115	34.0
Female	9	82.0	58	64.0	41	67.0	117	66.0	225	66.0
Total	11	100.0	90	100.0	61	100.0	178	100%	340	100.0

Table 08: Distribution of Student-Respondents by School Segment

School Segment	Frequency	Percentage
School A (GCIC)	11	3.0
School B (CSA)	90	26.0
School C (MSHS)	61	18.0
School D (MHS)	178	52.0
Total	340	100.0

Table 09: Distribution of Student-Respondents by Strand

Strand	School A		School B		School C		School D		Overall	
	f	%	f	%	f	%	f	%	f	%
STEM	1	9.0	14	16.0	3	5.0	24	13.0	42	12.0
ABM	2	18.0	18	20.0	31	51.0	54	30.0	105	31.0
HUMSS	6	55.0	15	17.0	11	18.0	33	19.0	65	19.0
TVL	2	18.0	21	23.0	13	21.0	56	31.0	92	27.0
SPORTS	0	0.0	0	0.0	0	0.0	1	1.0	1	0.0
ARTS & DESIGN	0	0.0	22	24.0	3	5.0	10	6.0	35	10.0
Total	11	100.0	90	100.0	61	100.0	178	100.0	340	100.0

Table 10: Distribution of Student-Respondents by Grade Level

Grade Level	School A		School B		School C		School D		Overall	
	f	%	f	%	f	%	f	%	f	%
11	6	55%	32	36%	29	48%	83	47%	150	44%

12	5	45%	58	64%	32	52%	95	53%	190	56%
Total	11	100%	90	100%	61	100%	178	100%	340	100%

Table 11: Distribution of Student-Respondents in terms of Socio-Economic Status

Socio Economic Status	School A		School B		School C		School D		Overall	
	f	%	f	%	f	%	f	%	f	%
Less than 11,690/month (Poor)	0	0.0	2	2.0	17	28.0	68	38.0	87	26.0
11,690 - 23,380/month (Low Income but Not Poor)	2	18.0	14	16.0	21	34.0	62	35.0	99	29.0
23,381 - 46,760/month (Lower Middle Income)	5	45.0	17	19.0	11	18.0	25	14.0	58	17.0
46,761 – 81,831/month (Middle Class)	2	18.0	29	32.0	10	16.0	21	12.0	62	18.0
81,832 – 140,284/month (Upper Middle Income)	2	18.0	20	22.0	2	3.0	2	1.0	26	8.0
140,285 – 233,806/month (Upper Income but Not Rich)	0	0.0	6	7.0	0	0.0	0	0.0	6	2.0
At least 233,807/month (Rich)	0	0.0	2	2.0	0	0.0	0	0.0	2	1.0
Total	11	100.0	90	100.0	61	100.0	178	100.0	340	100.0

Table 12: Distribution of Student-Respondents in terms of Academic Achievement as Measured by GWA

School	ENGLISH			MATHEMATICS			SCIENCE			COMPOSITE		
	Mean	SD	Interpret	Mean	SD	Interpret	Mean	SD	Interpret	Mean	SD	Interpret
School A	88.00	4.92	VS	89.00	4.06	VS	89.00	3.64	VS	89.00	4.21	VS
School B	94.00	7.42	O	99.00	3.15	O	97.00	6.27	O	97.00	5.61	O
School C	95.00	1.95	O	94.00	1.46	O	97.00	0.90	O	95.00	1.44	O
School D	82.00	7.09	S	84.00	7.22	S	86.00	7.14	VS	84.00	7.15	S
Overall	90.00	5.35	O	92.00	3.97	O	92.00	4.49	O	91.00	4.60	O

Table 13: Distribution of Teacher-Respondents in terms of Age

Age Bracket	School A		School B		School C		School D		Overall	
	f	%	f	%	f	%	f	%	f	%
21-30 y/o	9	64.0	19	49.0	4	40.0	15	38.0	47	46.0
31-40 y/o	3	21.0	12	31.0	3	30.0	16	40.0	34	33.0
≥ 41 y/o	2	14.0	8	21.0	3	30.0	9	23.0	22	21.0
Total	14	100.0	39	100.0	10	100.0	40	100.0	103	100.0

Table 14: Distribution of Teacher-Respondents in terms of Sex

Sex	School A		School B		School C		School D		Overall	
	f	%	f	%	f	%	f	%	f	%
Male	9	64%	21	54%	4	40%	12	30%	46	45%
Female	5	36%	18	46%	6	60%	28	70%	57	55%
Total	14	100%	39	100%	10	100%	40	100%	103	100%

It is a reality that the academe is dominated by female teachers. According to [9], they cited that it is common knowledge that the teaching profession is mostly dominated by female teachers. One reason is that taking care of children in schools is traditionally seen as “extension of motherhood” and therefore a “natural” job for women. With this cultural perception and traditional practice, women dominate the teaching profession. This is supported by the data of the Philippine Commission on Women in their article in May 2014, “that in the school year 2008-2009, data revealed that 89.58 percent of the public elementary school teachers are female; only 10.42 percent are male teachers. In the public secondary schools, 77.06 percent are female; only 22.94 percent are male teachers.” This did not change much until the year 2018 with 77.7% female teachers according to the World Bank collection of development indicators published by www.tradingeconomics.com this year (2021).

Table 15: Distribution of Teacher-Respondents in terms of Degree Earned

Degree Earned	School A		School B		School C		School D		Overall	
	f	%	f	%	f	%	f	%	f	%
Bachelor's Degree	7	50.0	16	41.0	3	30.0	17	43.0	43	42.0
Master's Degree	1	7.0	7	18.0	2	20.0	6	15.0	16	16.0
Master Units Earned	4	29.0	11	28.0	4	40.0	13	33.0	32	31.0
Doctorate Degree	2	14.0	5	13.0	1	10.0	4	10.0	12	12.0
Total	14	100.0	39	100.0	10	100.0	40	100.0	103	100.0

Table 16: Distribution of Teacher-Respondents in terms of School Segment

School Segment	Frequency	Percentage
School A	14	14.0
School B	39	38.0
School C	10	10.0
School D	40	39.0

Total	103	100.0
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Table 17: Distribution of Teacher-Respondents In terms of Subject Taught

Subject Taught	School A		School B		School C		School D		Overall	
	F	%	f	%	f	%	f	%	f	%
Mathematics	1	7.0	4	10.0	3	30.0	3	8.0	11	11.0
Science	2	14.0	9	23.0	1	10.0	11	28.0	23	22.0
Languages	2	14.0	11	28.0	3	30.0	9	23.0	25	24.0
Social Studies	9	64.0	15	38.0	3	30.0	17	43.0	44	43.0
Total	14	100.0	39	100.0	10	100.0	40	100.0	103	100.0

In the advent of IR 4.0 and 21st Century learning framework as discussed in Chapter 2, learning has to be technology-aided to prepare students for the future of employment and industry requirements. An author [10] emphasized that the Third and Fourth Industrial Revolutions introduced production automation and intangible Introduction value creation. These new drivers of growth created massive shifts in the skills required to contribute to the economy and the ways in which people work, raising questions about the adequacy of current education systems in keeping pace with these changes (World Economic Forum, 2020). Graduates will be introduced to wholly new business models whose workforces are much more distributed. In an increasingly interconnected world, future workers will be expected to collaborate with peers residing in various parts of the globe, understand cultural nuances and, in many cases, use digital tools to enable these new types of interactions (World Economic Forum, 2018).

Table 18: Distribution of Teacher-Respondents in terms of Teaching Experience

Years of Teaching Experience	School A		School B		School C		School D		Overall	
	F	%	F	%	f	%	f	%	f	%
Less than 1 year	4	29%	6	15%	1	10%	2	5%	13	13%
1 – 5 years	5	36%	12	31%	3	30%	16	40%	36	35%
6 – 10 years	3	21%	10	26%	3	30%	7	18%	23	22%
11 years and above	2	14%	11	28%	3	30%	15	38%	31	30%
Total	14	100%	39	100%	10	100%	40	100%	103	100%

An author [11] in his article titled, Digital Intelligence: A Key Competence for the Future of Work, defined Digital intelligence (DQ) as the ability to acquire and apply new knowledge and skills related to digital technologies: social, mobile, analytics, cloud, and, more recently, cybersecurity. More than just the ability to use digital technologies, it addresses the what, why, where, when, who, how, and how much of digital technology to improve our operational efficiency and outcomes. Digital intelligence is fundamentally about our relationship with technology, just as emotional intelligence is about our relationship with others. The World Economic Forum (2016) presented digital intelligence as "the sum of the social, emotional and cognitive skills that enable people to meet the challenges and demands of digital life". This implies that digital intelligence encompasses the many aspects of the person's totality and how he utilizes technology for all sorts of purposes.

Table 19: Level of Learning of Generation Z Learners as Assessed by themselves and their Teachers in Terms of the Digital Learning Dimension

Indicators	Students		Teachers	
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	Mean	SD	Manifestation	VI	Mean	SD	Manifestation	VI
Own gadgets such as mobile phones, iPad devices, etc.	3.0500	.98985	Frequently Manifested	HL	3.2524	.77609	Frequently Manifested	HL
Rely more on digital resources than books.	2.7706	.87930	Frequently Manifested	HL	3.1942	.75483	Frequently Manifested	HL
Own multiple gadgets and are using them all at the same time.	1.9176	.90181	Sometimes Manifested	LL	2.6602	.88066	Frequently Manifested	HL
Use gadgets in learning and researching.	3.1029	.87811	Frequently Manifested	HL	3.1553	.78911	Frequently Manifested	HL
Take notes by taking photos of the slides/power point using gadgets.	2.9824	.88230	Frequently Manifested	HL	3.2816	.89022	Frequently Manifested	HL
Prefer researching online than visiting the library.	2.7618	.84787	Frequently Manifested	HL	3.2913	.83585	Always Manifested	VHL
Feel more at ease when gadgets are around, or internet connection is available.	2.9971	.86389	Frequently Manifested	HL	3.4466	.66757	Always Manifested	VHL
Accomplish tasks more with the use of gadgets and devices.	2.9353	.86998	Frequently Manifested	HL	3.2718	.79452	Always Manifested	VHL
Use smartphones to tell date & time, taking photos and calendaring schedules.	3.1412	.93320	Frequently Manifested	HL	3.2039	.87849	Frequently Manifested	HL
Complete tasks more quickly through the use of laptops, internet and other technological devices.	3.1059	.89606	Frequently Manifested	HL	3.3301	.67720	Always Manifested	VHL

Composite	2.8765	.89424	Frequently Manifested	HL	3.2087	.79445	Frequently Manifested	HL
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Table 20: LEGEND

SCALE	RESPONSE	RANGE OF VALUE	VERBAL INTERPRETATION	DESCRIPTIVE VALUE
4	Always Manifested	4.00 – 3.26	Very High Level (VHL)	90% to 100% of the time manifested
3	Frequently Manifested	3.25 – 2.51	High Level (HL)	70% to 89% of the time manifested
2	Sometimes Manifested	2.50 – 1.76	Low Level (LL)	50% to 69% of the time manifested
1	Not at All Manifested	1.75 – 1.00	Very Low Level (VLL)	Less than 50% of the time manifested

The items showing the highest mean of both students and their teachers support what [12] claimed as cited which states that the Gen Z populace is quite dependent on their devices, ranging from mobile phones to game consoles. Devices play important roles in their everyday life, ranging from entertainment to providing information. Interacting with the devices, or with people through a digital device, takes a significant amount of their time. Furthermore, a University of Maryland study in 2010 found that 79 percent of young people displayed symptoms of emotional distress when kept away from their personal electronic devices.

Table 21: Level of Learning of Generation Z Learners as Assessed by Students Themselves and their Teachers in Terms of the Social Learning Dimension

Indicators	Students			Teachers		
	Mean	SD	Interpret	Mean	SD	Interpret
Perform better when provided interactive classroom activities instead of formal lecture.	2.6559	.75402	Frequently Manifested	3.1262	.66686	Frequently Manifested
More responsive when actual real-life scenarios are presented to cover topics.	2.9235	.80561	Frequently Manifested	3.4466	.65272	Always Manifested
Actively participate when asked to work in teams/groups.	3.0206	.87045	Frequently Manifested	2.9709	.82196	Frequently Manifested
Enjoy discussing with classmates or peers instead of listening to the teacher.	2.3794	.91215	Sometimes Manifested	2.7961	.79655	Frequently Manifested
Ask peers/friends for feedback about their classroom performance	2.4206	.96983	Sometimes Manifested	2.5825	.73464	Frequently Manifested
Discuss and share notes and projects through digital groups and chatrooms.	2.5088	.83255	Sometimes Manifested	3.2330	.76957	Frequently Manifested
See the class as a social extension of their personal	2.6853	.91743	Frequently Manifested	2.9029	.72104	Frequently Manifested

life.						
Get affected by their peers' opinions.	2.4265	.86075	Sometimes Manifested	2.9029	.64950	Frequently Manifested
Consider social media as an extension of their personal life.	2.5471	.91569	Frequently Manifested	3.0485	.69138	Frequently Manifested
Do homework and projects together in their classmates' home or virtual group.	2.3324	.83338	Sometimes Manifested	2.6699	.84469	Frequently Manifested
Composite	2.5900	.86719	Frequently Manifested	2.9680	.73489	Frequently Manifested

The item which garnered the highest mean from the assessment of students is supported by the study of [13]. It states that Gen Z learners are kinesthetic, experiential, hands-on learners who prefer to learn by doing rather than being told what to do or by reading text. They also love to work with others. This implies that the classroom must evolve from the traditional lecture-type sessions where teachers act as the sole source of information to a more dynamic and interactive environment aided by technology and welcoming to the diverse ideas and practices of students. The perception on the item with the lowest means may have been affected by the current pandemic which prevents students' physical movement. The item with the lowest mean from the assessment of teachers can be explained by how [14] described Gen Z learners as "independent, stubborn, pragmatic". It can be inferred that while this generation of learners are highly social people, they do not get affected easily by comments and opinions of other people about them. They can be stubborn, hardheaded, or logical and are highly confident on how they perceive and do things.

Table 22: Level of Learning of Generation Z Learners as Assessed by Students Themselves and their Teachers in Terms of the Mobile Learning Dimension

Indicators	Students			Teachers		
	Mean	SD	Interpret	Mean	SD	Interpret
Move around during discussions.	1.7647	.83996	Not All Manifested	2.3398	1.00541	Sometimes Manifested
Interact during group activities.	3.0559	.90872	Frequently Manifested	3.2039	.66213	Frequently Manifested
Express preference living in dorms and boarding houses.	1.8676	.94548	Sometimes Manifested	1.9029	.81065	Sometimes Manifested
Communicate using digital platforms than personal interface.	2.3588	.83122	Sometimes Manifested	2.4660	.82623	Sometimes Manifested
Engage during online learning activities.	2.6765	.82443	Frequently Manifested	2.7864	.63633	Frequently Manifested
Submit assignments, tasks, projects and outputs online.	3.1824	.90017	Frequently Manifested	3.1359	.74160	Frequently Manifested
Submit assignments, tasks, projects, and output on digital format instead of printed material.	2.8471	.92817	Frequently Manifested	3.0194	.82819	Frequently Manifested
Prefer seating anywhere instead of being assigned in	2.6235	1.07782	Frequently Manifested	2.6893	.95002	Frequently Manifested

a specific seat during face-to-face classes.						
Engage/connect more when classes are held outside the school.	2.5088	.90063	Sometimes Manifested	2.7864	.81229	Frequently Manifested
Participate in educational trips and tours.	2.9971	.97611	Frequently Manifested	3.1845	.90475	Frequently Manifested
Composite	2.5882	.91327	Frequently Manifested	2.7515	.81776	Frequently Manifested

Table 23: Level of Learning of Generation Z Learners as Assessed by Students Themselves and their Teachers in Terms of the Global Learning Dimension

Indicators	Students			Teachers		
	Mean	SD	Interpret	Mean	SD	Interpret
Express awareness on global issues and trends.	2.6676	.83338	Frequently Manifested	2.8835	.80806	Frequently Manifested
Compare the Philippines with others in terms of practices, culture, lifestyle and etc.	2.4118	.87972	Sometimes Manifested	2.5728	.65082	Frequently Manifested
Share experiences of their actual travels.	2.3441	.88704	Sometimes Manifested	2.6408	.69810	Frequently Manifested
Show interest in watching foreign films, shows and news.	2.6471	.92753	Frequently Manifested	3.0097	.70704	Frequently Manifested
Keep friends from other countries personally and virtually.	2.2147	.97661	Sometimes Manifested	2.2621	.82796	Sometimes Manifested
Rely more on foreign sources during research.	2.4559	.74931	Sometimes Manifested	3.0194	.86297	Frequently Manifested
Quote sayings and statements of foreign personalities.	2.2941	.78441	Sometimes Manifested	2.8252	.79739	Frequently Manifested
Regard foreign research more credible as basis of conclusion.	2.3441	.73821	Sometimes Manifested	2.9029	.74774	Frequently Manifested
Subscribe on foreign online blogs and pages.	2.2588	.92367	Sometimes Manifested	2.6505	.76323	Frequently Manifested
Idolize and admire foreign celebrities and personalities.	2.5971	.93726	Frequently Manifested	2.9903	.77327	Frequently Manifested
Composite	2.4235	.86371	Sometimes Manifested	2.7757	.76366	Frequently Manifested

Table 24: Level of Learning of Generation Z Learners as Assessed by Students Themselves and their Teachers in Terms of the Visual Learning Dimension

Indicators	Students			Teachers		
	Mean	SD	Interpret	Mean	SD	Interpret
Respond more when visual aids and other materials are used.	2.9853	.77750	Frequently Manifested	3.2039	.66213	Frequently Manifested

Watch videos and clips in classroom discussion.	2.4794	.92308	Sometimes Manifested	3.2233	.74006	Frequently Manifested
Engage/connect when shown actual examples.	2.9794	.86365	Frequently Manifested	3.2330	.68890	Frequently Manifested
Use logos, emojis, codes, photos, and signs instead of actual words in self-expression.	2.1794	.92180	Sometimes Manifested	2.8835	.79583	Frequently Manifested
Support their opinions and conclusions through videos and clips seen/viewed online.	2.4412	.78673	Sometimes Manifested	2.8544	.77216	Frequently Manifested
Watch online tutorial channels and videos to learn new skills.	2.9588	.91113	Frequently Manifested	3.1456	.69180	Frequently Manifested
Get motivated in reading write-ups and articles when there are catchy and exciting pictures.	2.7353	.91235	Frequently Manifested	3.0291	.78536	Frequently Manifested
Learn the latest news online through gadgets than reading newspaper or listening to radio.	2.9618	.85962	Frequently Manifested	3.3689	.74083	Always Manifested
Connect/understand concepts and ideas through available photos, symbols, colors or logos.	2.9882	.75639	Frequently Manifested	3.2136	.73632	Frequently Manifested
Remember concepts more when associated with a color or a photo.	2.9647	.80481	Frequently Manifested	3.1845	.77646	Frequently Manifested
Composite	2.7674	.85171	Frequently Manifested	3.1340	.73899	Frequently Manifested

An author [15] claims that Gen Z learners have fast delivery of content with complex graphics. They are kinesthetic, experiential, hands-on learners who prefer to learn by doing rather than being told what to do or by reading text. Learning is not a spectator sport. They prefer random access, graphics first, connected activities.

Table 25: Overall Level of Learning Assessment of Gen Z Learners as Assessed by Students Themselves and their Teachers in Terms of Learning Dimensions

Variables	Composite					
	Students			Teachers		
	Mean	SD	Interpret	Mean	SD	Interpret
Social Dimension	2.5900	.47219	Frequently Manifested	2.9680	.42153	Frequently Manifested
Mobile Dimension	2.5882	.47284	Frequently Manifested	2.7515	.41370	Frequently Manifested
Global Dimension	2.4235	.51934	Sometimes Manifested	2.7757	.48496	Frequently Manifested
Digital Dimension	2.8765	.60336	Frequently Manifested	3.2087	.55820	Frequently Manifested
Visual Dimension	2.7674	.51915	Frequently Manifested	3.1340	.48780	Frequently Manifested

Grand Mean	2.6491	.51738	Frequently Manifested	2.9676	.47324	Frequently Manifested
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Table 26: Significant Differences in the Assessment between Gen Z Learners and their Teachers in terms of Digital Learning Dimension

School Segment	Assessment of Gen Z Learners versus Teachers			
	t	sig	Decision Ho	Interpretation
School A	-.467	.645	Accept	Not Significant
School B	-3.882	.000	Reject	Significant
School C	-1.799	.076	Accept	Not Significant
School D	-4.405	.000	Reject	Significant

The study of [16] revealed that males are more confident in using technology for learning. In addition, the study of [17] explained that men are more logical and spatial as manifested by their preference to connect patterns and designs, solve problems logically, classify information to arrive to an interpretation which are basic skills required in the use of technology. On the other hand, women were found to be more relational and are more inclined to being able to connect and relate with others as manifested by their confidence in speaking and talking to their classmates when interpreting ideas.

Table 27: Significant Differences in the Assessment between Gen Z Learners and their Teachers in terms of Social Learning Dimension

School Segment	Assessment of Gen Z Learners versus Teachers			
	t	sig	Decision Ho	Interpretation
School A	-2.266	.033	Reject	Significant
School B	-3.890	.000	Reject	Significant
School C	-3.882	.000	Reject	Significant
School D	-3.688	.000	Reject	Significant

Table 28: Significant Differences in the Assessment between Gen Z Learners and their Teachers in terms of Mobile Learning Dimension

School Segment	Assessment of Gen Z Learners versus Teachers			
	t	Sig	Decision Ho	Interpretation
School A	-.768	.450	Accept	Not Significant
School B	1.027	.306	Accept	Not Significant
School C	-2.345	.022	Reject	Significant
School D	-2.571	.011	Reject	Significant

An author [18] stated that while digital is alienating Generation Z from the immediate physical environment, it is also eliminating physical boundaries of location. Distance has less meant for them. They continuously interact with peers from different geographies and different cultures if they are united over, say a game or some music. This constant borderless communication is affecting the way their psyche and lifestyle evolve. They are building a more globalized, borderless world. This suggests the preference of Gen Z for physical movement, exploration and travel which at this time of the pandemic has been greatly affected. The difference on the assessment results of Schools A and B and that of Schools C and D, may have been influenced by the nature of the school segment they belong to

and the respondents' socio-economic status. It can be recalled that Schools A and C are both private senior high schools, while Schools B and D are both public senior high schools. It is common knowledge that private schools are given the leeway to integrate certain enhancements on the minimum requirements set by the Department of Education. Private schools may infuse additional institutional activities, programs and even subjects to meet the set objectives of the institution as enshrined in their mission, vision, and philosophy. This is why some private schools have high tuition fees charged to their students. The difference on the nature of the curriculum and the socio-economic status of students between private schools and public schools were explained by [19]. They explained how families of higher socio-economic status have the resources to supplement their child's schooling and educational requirements. Their participation to extra-curricular activities aid to the students' further personal development. Additional trainings at the side or even acquisition of new skills through additional workshops all work together to contribute to the students' advancement. These supplementary schoolings and programs may range from summer talent camps, tutorials, sports clinic, dance lessons, educational trips and more which will charge extra costs. Only those who have available resources will be able to send their children to these kinds of trainings and activities which an average or below average family cannot afford. It is also common knowledge that traveling enriches a person's socio-cultural awareness through the experiences gained from visiting places and exposure to other people's traditions, practices and cultures. However, as this would cost money, only those who have the capacity can afford to travel to certain places, either locally or abroad, whether as part of school requirements or personal trips. Considering the afore-cited factors, these can be inferred as potential reasons for the inconsistency in the perception of the respondents from the two (2) school groups, private and public, in terms of mobile dimension. Though mobility has been greatly impacted by the global health pandemic during this time, the capability to still be able to travel remains intact.

Table 29: Significant Differences in the Assessment between Gen Z Learners and their Teachers in terms of Global Learning Dimension

School Segment	Assessment of Gen Z Learners versus Teachers			
	t	Sig	Decision Ho	Interpretation
School A	-1.522	.142	Accept	Not Significant
School B	-3.025	.003	Reject	Significant
School C	-2.353	.021	Reject	Significant
School D	-3.732	.000	Reject	Significant

Table presents the differences in the assessment between the Gen Z learners and their teachers in terms of global dimension. Using T-Test of Independent Samples, results showed that only School A obtained no significant difference in terms of global dimension. In this case, the null hypothesis was accepted at 5% level of significance. On the other hand, Schools B, C and D revealed significant differences in the assessment made by the three (3) groups of respondents, thus rejecting the null hypothesis at 5% level of significance. It could be inferred that groups of respondents at Schools A had the same views with respect to the assessment of global dimension of learners, while Schools B, C and D had different perceptions. Remarkably, the differences in the assessments of Schools B, C and D were influenced by the higher mean scores revealed by the teacher-respondents compared with the Gen Z Learners. An author [20] defined global dimension as the general characteristics of the Generation Z learners, specifically their global connectivity, exposure to global issues and events and keen interest to travelling, living and working in multiple countries. With the results of the assessment showing that only School A obtained no significant difference in terms of global dimension, it may be attributed to the nature of the school segment. School A was selected as one of the locales for this study not only

because it is the researcher's place of work, but also due to the nature of its curriculum. School A is a hybrid private senior high school and the only locale which offers higher education and TESDA accredited programs. The senior high school curriculum used by School A is also based on the DepEd curriculum but integrated with several enhancements to fit the pre-college design and approach it intended for the program. As an innovative school, part of the enhancements in the curriculum of School A which support the promotion of global learning is the deliberate cross-curricular and trans-disciplinarity integration promoting holistic education among its programs. As a 21st Century school, School A's curriculum is connected to the community – local, national and global. It incorporates higher order thinking skills, multiple intelligences, technology and multi-media, and 21st century literacies and themes. It promotes real-life contextualization using authentic cases, samples and scenarios that exist locally and globally [21]. School A's teachers are also regularly trained in terms of the latest trends in global education practices. They are trained on how to still deliver experiential, holistic and global learning amidst the pandemic. The school's active partnerships with other schools and organizations abroad open opportunities for international exchanges and borderless education to both students and teachers. These suggest a common global mindset among the members of its community. Hence, no significant difference was found in the assessment of the respondents in terms of global dimension.

Table 30: Significant Differences in the Assessment between Gen Z Learners and their Teachers in terms of Visual Learning Dimension

School Segment	Assessment of Gen Z Learners versus Teachers			
	T	sig	Decision Ho	Interpretation
School A	-2.230	.036	Reject	Significant
School B	-2.156	.033	Reject	Significant
School C	-2.345	.022	Reject	Significant
School D	-4.385	.000	Reject	Significant

Table 31: Level of Students' Digital Literacy as Measured by Northstar Digital Literacy Online Test

Variable	SCHOOL A			SCHOOL B			SCHOOL C			SCHOOL D		
	Mean	SD	VI	Mean	SD	VI	Mean	SD	VI	Mean	SD	VI
Social media	82.50	9.91	Failed	87.02	9.62	Passed	90.20	5.46	Passed	86.88	9.65	Passed
Information Literacy	57.43	20.39	Failed	73.57	15.70	Failed	80.19	7.87	Failed	73.62	15.92	Failed
Supporting K-12 Distance Learning	85.38	10.80	Passed	88.24	10.37	Passed	90.49	6.50	Passed	87.59	10.69	Passed
Career Search Skills	52.65	20.00	Failed	70.81	16.25	Failed	78.93	7.93	Failed	70.97	15.92	Failed
Digital Footprint	65.28	16.67	Failed	77.93	17.34	Failed	86.76	8.45	Passed	78.79	17.38	Failed
Composite	68.65	15.56	Failed	79.51	13.86	Failed	85.31	7.24	Passed	79.57	13.91	Failed

Table 32: Level of Teachers' Digital Literacy as Measured by Northstar Digital Literacy Online Test

Variable	SCHOOL A			SCHOOL B			SCHOOL C			SCHOOL D		
	Mean	SD	VI	Mean	SD	VI	Mean	SD	VI	Mean	SD	VI
Social media	87.12	7.61	Passed	87.42	8.64	Passed	86.01	11.91	Passed	88.28	7.21	Passed
Information Literacy	79.30	14.25	Failed	82.49	11.40	Failed	80.45	11.94	Failed	82.16	12.64	Failed
Supporting K-12 Distance Learning	87.39	4.92	Passed	87.35	4.56	Passed	89.64	5.54	Passed	87.45	4.34	Passed
Career Search Skills	75.09	9.59	Failed	76.07	9.16	Failed	76.22	9.80	Failed	77.88	9.10	Failed
Digital Footprint	82.76	6.31	Failed	80.54	14.10	Failed	75.27	23.74	Failed	83.63	5.42	Failed
Composite	82.33	8.54	Failed	82.77	9.57	Failed	81.52	12.59	Failed	83.88	7.74	Failed

Table 33: Significant Difference in the Students and Teachers' Level of Digital Literacy as measured by Northstar Digital Literacy Online Test

Variable	SCHOOL A			SCHOOL B			SCHOOL C			SCHOOL D		
	t	sig	INT	t	sig	INT	t	sig	INT	t	sig	INT
Social media	-.820	.431	NS	-1.636	.109	NS	.727	.486	NS	-.987	.330	NS
Information Literacy	-2.244	.049	NS	-4.650	.000	S	.086	.933	NS	-3.116	.003	S
Supporting K-12 Distance Learning	-.302	.769	NS	-1.157	.254	NS	-.123	.905	NS	-.760	.452	NS
Career Search Skills	-3.493	.006	S	-4.072	.000	S	.185	.857	NS	-3.096	.004	S
Digital Footprint	-2.882	.016	S	-3.147	.003	S	1.461	.178	NS	-2.150	.038	S

4. CONCLUSION

We now live in an unprecedented time where the speed of technological advancement and evolution are accelerating, inevitable and unmatched. We now live in a world where technology created a virtual extension which may be unreal but is causing real-life impacts and significance. We now witness the swift merging of two worlds while us, humans, exist in between. In a world of volatility, uncertainty, complexity, and ambiguity (VUCA) brought about by this technological advancement, it is still through technology that we are able to survive and see ourselves evolving, adapting and thriving. The changes happening around bring unprecedented profits but with all these creative disruptions brought about

by forces beyond our control poses the issue on where we must position ourselves in terms of digital technology. Are we merely the creators or are we the “intelligent” creators? Are we just the end-users or do we prefer to be the “intelligent” end-users? During the conceptualization stage, the researcher was baffled and intrigued by the seemingly advance digital skills exhibited by those who came from the most recent generations, the Gen Z and the Gen Alpha. Observations and anecdotal reports on their surprising level of adeptness on how technology is utilized by these cohorts, mostly for entertainment, even at a very young age, were supported and affirmed by many. The researcher initially believed that this was digital intelligence. However, in the course of the study and voluminous literature review, this unusual exhibition of digital skill is found to be just a manifestation of digital literacy and is only a part of a multifaceted structure of skills-set, capabilities, and competencies which build-up digital intelligence (DQ). Exploring what factors influence digital intelligence among Generation Z students and how the perception of their teachers differs, the researcher identified a set of participants’ profile variables which were analyzed and were found to reveal significant implications to digital intelligence. These profile variables were found to determine and significantly influence the type of technology device being used, the level of technology sophistication needed, the length of time spent, the purpose and expectations, the level of confidence, the varying perceptions and level of maturity towards technology, the purpose for utilization, the ability to respond to technology risks, and even how technology is being accessed. These variables and its impact to how students live and learn, establish the need to go beyond digital literacy and the technology-know-how. People’s need for and dependence to technology continue to change as some of these profile variables evolve. Digital Technology can be considered a double-edged sword. As it brings immeasurable benefits to people’s lives, it can also cause massive threats and risks to personal safety and security if not utilized intelligently. It is only through a set of critical digital abilities that will guide and enable individuals to face the challenges of the digital age. This set of timeless skills is called digital intelligence. As digital skills can be learned, digital intelligence can also be developed. It is never enough that one is adept in using technology. One must also be prepared to use technology, intelligently. Gen Z learners’ skills with technology or their level of digital literacy are part of who they are as digital natives. The generational gaps between students and teachers can affect the perception of how students utilize technology, how they learn, how people behave and how teachers may intervene to prepare students to be digitally intelligent (DQ). These gaps serve as a challenge for educators to understand where the students are coming from. As a result, there is disconnect as to what is acceptable and unacceptable in terms of attitude and behavior towards technology. With the role of education and schools in general to prepare students to become future-ready or future-proof, developing the right mindset and values towards responsible and smart use of technology should start among teachers. This supports the need for a training program that will prepare teachers to bridge these gaps and to develop digital intelligence among students. Digital Literacy can create technology assemblers, but digital intelligence can produce technology designers.

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