



Generation Z: Learners' Profiles and Teaching Challenges

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ABSTRACT

Given the significant differences among different generations, acceleration of changes due to technological developments, and characteristics of recent generations, it is necessary to recognize the characteristics of Generation Z, in order to be able to create an effective teaching-learning process. Under the influence of digital technology, Generation Z has undergone tremendous changes in several learning parameters, such as time and manner of focus, tendencies, and specific strategies. In this article, by reviewing the characteristics of this generation, the authors tried to provide practical points in teaching methods for this generation.

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INTRODUCTION

The term "generation" in social and demographic studies has different dimensions and definitions. Generation in the social dimension refers to people who are born in the same time period and have similar cultural experiences [1]. The reactions, preferences, and priorities of people of each generation are shaped by the events of the world around them, technology, and social norms [2].

Four generations form the body of the current employment and educational system:

Explosive generation (baby boomers): Baby boomers were born between 1946 and 1964 and lived in the post-World War II era. During this period, the birth rate increased significantly. The Western world also faced political and social turmoil, including the Vietnam War and civil unrests [3]. In the workplace, this generation

was less stressed and more independent but showed more emotional dependence on their environment and more commitment to timing than the next two generations [4]. The explosive generation influenced by the post-war atmosphere worked hard with a high team spirit. Being judgmental is another characteristic of this generation [2].

Generation X (baby busters): This generation was born between 1965 and 1980. They grew amid financial, familial, and social distrust. There was a high unemployment rate and economic recession during this period. Features of this generation were flexibility [4], less loyalty to their employer, realism, and more flexible scheduling preference [3]. Evidence shows that although they are individualistic, sometimes they strongly prefer teamwork [4].

Generation Y (millennium): This generation was born between 1981 and 1996. They were born and raised in the years leading up to events such as the fall of the Berlin Wall, 9/11, global warming, growing international connections and travels, and the rise of technology. Having diverse experiences in various fields (job, education, and leisure) is a priority for this generation, unlike the previous generation, who values deep and long-term experiences. This generation is optimistic, confident, and eager to do teamwork and share ideas because it has grown up in an environment full of information and choices (unlike the previous generation who wanted to protect the ideas) [2].

Generation Z (Internet generation, Zoomers): This generation was born between 1997 and 2017; they lived in the age of technology and preferred to work or study at their own pace [5]. This generation is interested in receiving immediate rewards and personalizing affairs (having personal experience of events). This feature makes these people entrepreneurial and willing to learn self-study. Another important feature of this generation is their appreciation of stories. This feature is presented in the form of self-expression or following others' stories. This generation clearly cares about the opinion of their peers [6]. They are present in cyberspace, excited, and, at the same time, worried about the future and preparing for the real world [5].

The importance of knowing Generation Z: Learners of each generation have their own unique characteristics that distinguish them from the previous generation. Knowing the diversity of generations is very important for medical professors because they are looking for educational strategies that are compatible with the needs of students [7]. While medical schools were adapted to millennial students, the Zoomers generation is entering university with different characteristics from the previous generation, consequently presenting new challenges for educators [8]. Professors (mostly from Generation Y or X with different characteristics such as less understanding of technology) have different expectations and

concerns from their Generation-Z students [9]. Evidence shows that while college students spend on average 9 hours a day using multimedia, professors believe that today's students do not pay enough attention in classrooms [10]. It is quite clear that using old teaching methods is not effective for the new generation of students. Theoretical approaches that are more textbook-based are boring for these students. On the other hand, the quality of learning increases with the self-learning activities of students. Therefore, teachers should encourage students to use appropriate and high-quality learning methods [11]. It has been shown that the brain of Generation Z is different from other generations. This difference is not in terms of genetics but rather under the influence of external environmental factors; the brain of this generation is intricately wired. The part of the brain that is responsible for visual ability, including "complex visual images," is much more advanced in this generation; thus, visual forms of learning are more effective. Learning through listening, such as lectures or discussions, is much less popular in this group; while interactive games, collaborative projects, and so on are more acceptable to them. The use of technology is highly important to this generation; in a study, 100% of students said they had learned more from technology than lectures. Therefore, not only should technology be integrated into teaching, but also creative classes with student-based learning environments must be designed. For example, by applying unique initiatives, instructors must use more visual teaching methods that involve the active participation of their learners. The students should be able to quickly see the results of their activities so that the learning process becomes attractive for them [12].

The purpose of this narrative review was to identify the conflicts that can occur between professors and students due to generational differences and to provide practical information about the characteristics and needs of this generation that can pave the way for these individuals to achieve more success in the field of education.

METHODS

According to the type of this narrative review, a search was carried out with the key words “Generation Z, Zommer, teaching-learning, education” in the Medline database. English articles published from 2000 to 2021 were included. All articles related to the teaching-learning characteristics of Generation Z were assessed.

Educational features and requirements:

Entrepreneurship and self-reliance

Zoomers are accustomed to getting the information they need through search engines. Therefore, in learning, they also want to use self-service tools and self-education methods [6]. However, there are individual limitations for students in this direction (for example, difficulty in self-assessment or determining their educational goals) [13]. Therefore, the role of teacher as a facilitator and role model in transfer of teacher-centered education to student-centered education is vital to guide students in setting educational goals and self-assessment of the learning process [14].

Purposeful, competitive, and eager to take practical action

Generation Z focuses on the future and its goals. Thus, if they are aware of the goals and effectiveness of educational materials, they will participate in the educational process with more motivation. Acquisition of practical experiences, especially in the context of class and university competitions, accelerates and facilitates learning [6]. Holding a reverse class (flipped classroom) and journal club is an example of problem-solving training methods that allow Zoomers to be creative to discuss with peers and strengthen their problem-solving ability [15].

Seeking feedback and rewards

Generation Z seeks person-to-person feedback [16]. Feedback should be brief, concise, and presented in the relevant situation [10]. For this generation, working hard is a value as long as it is properly appreciated. For example, certification after the end of each training course can be an incentive. For this generation, rewards should be commensurate with the amount of time they spend working. The most

important incentives for Generation-Z students are job, learning, and self-respect. The biggest advantages of this generation are having information about advanced technology, willingness for teamwork and social communication, and being multitasking [17, 18].

Studying the learning features of Generation Z shows that they like to learn by themselves, and that they are ambitious, independent, and focused on personal development. They are always looking for connections between scientific issues and real situations. As in real life, the learning process may not be successful with the first attempt. Therefore, teachers should have a supportive role for their students and motivate them for more search and better engagement so that they can study additional educational content. Generation-Z students tend to be flexible, but they also want to have the right to choose their favorite educational courses [11, 19, 20].

In order to reduce the conflict between professors and students, educational designers must build a bridge between generations. The use of technology and combined teaching methods make Generation Z feel that they are involved in educational content. Lecture-based methods are not effective for these students. Instead, using active learning methods and inverted classrooms (flipped classroom), which allows students to participate actively, such as case studies, joint projects, use of clickers for voting, critical thinking tasks, and storytelling that discusses different perspectives, can be more effective. Encouraging students to use their own technology (such as cell phones, tablets, laptops, etc.) in the learning environment is very important. For example, the teacher can ask students to search for a suitable website on the subject of the class and share the information with their classmates. The use of social media is a good way for students to connect with each other and answer questions or rethink the questions asked by professors [20]. Texts can be shared for pre-class study, or students can be asked to form a group to share class content. There are suitable educational

videos on the internet so that students can be asked to find one about the subject under study or to make a suitable film individually or in groups and share it on the Internet. The students of this generation can easily make movies on their mobile phones. Internet-based games that enhance critical thinking skills are a modern way of making learning environments attractive to students. Feedback should be based on the needs of the students, as it is very important for this generation to receive feedback. Of course, it should be noted that when social networks are used more widely, students must understand and comply with all aspects of patient confidentiality. This is so important that some universities, such as the University of Minnesota, have developed rules for students' explanations, even for corpses. Studies suggest that students should be supported by professors or mentored students, as well as that transition courses should be provided for students upon arrival at the university to familiarize them with the supportive structures and services available at the university, such as a library, computer site, etc. [10].

Student counseling services

Evidence shows that students of Generation Z may have more depression, anxiety, and other psychological problems than previous generations. Even subclinical levels of these problems lead to a decrease in students' empathy and altruism, lack of program design to help others, and more self-centered reasoning regarding other people's mental issues. Therefore, educational institutions should expand their consulting services to deal with these problems [21].

Voluntary actions

Generation Z has less volunteering experience and also is less motivated than the previous generations to volunteer in clinical settings. On the other hand, this generation emphasizes on providing solutions to social problems by eradicating the underlying problem, especially using the entrepreneurial approach and technology. For example, if they are asked to help charities to distribute food to the needy, they would rather work to find a way to

eradicate hunger in the community. The plan may be to design a new technology with a huge investment reflecting technology and entrepreneurship [21]. Students' voluntary activities have a positive relationship with students' involvement in clinical education. Voluntary activities also increase the number of professional interactions that medical students encounter, enhance their understanding of the overall quality of their medical education, and can influence students' choice of specialty in the future. Therefore, reduced motivation to perform voluntary activities in the new generation has changed the perception of these students about their medical education. The decline in volunteerism can be offset by the increasing demand for entrepreneurial opportunities that some colleges already provide. Such opportunities can be useful for medical education. For example, educational activities in entrepreneurship groups that include problem-solving have been shown to develop students' critical thinking skills. Creating medical education pathways that allow entrepreneurship can serve as pathways to create technological innovations. Although the majority of voluntary activities in medical schools occur in students' clinics with the aim of gaining clinical experience, in many medical schools, service opportunities are provided in the context of community organizations. Taking part in these activities not only increases the civic engagement and social responsibility of students but also helps public health and disease prevention programs. Instead of gaining clinical experience, these activities help students develop other professional skills. Developing programs in which students participate in community-based service activities is not only consistent with their relative characteristics but also helps shape their professional identities, improve their understanding of social accountability, and enhance their commitment to work in rural and low-income areas. Faculty members and managers should be aware of changing attitudes about volunteering and entrepreneurship between generations [7, 22].

Learning environment

Generation-Z students' preferences for

physical spaces are almost the opposite of the millennial generation. The previous generation prefers to operate in large, open, and unstructured environments where many people work together in different areas; while the new generation prefers quiet, visually designed locations where the goal of the activity to be performed is obvious. Redesigning or dividing existing learning spaces for specific educational activities may be considered for this purpose. In addition, Generation-Z students prefer to have spaces for collaboration and guidance. In both educational and working environments, Generation-Z students expect to be monitored rather than learning independently through new experiences. For Generation Z, training spaces with small groups for consultation and collaboration are recommended so that they can benefit from both the learning and professional development of the members. Generation Z expects more technology to be integrated into learning spaces [23]. For example, a survey of students found that 71% expected more use of technology in their classrooms. They are also increasingly using social media to connect with their professors. In addition, they prefer using electronic learning materials and electronic tests. Creating university spaces designed to address the technological concerns of the new generation may make learning easier compared to previous generations. In medical education, there are essential and elective educational topics. Regarding the selected topics that may be related to certain social deviances, such as abortion, addiction, etc., which can often be worrying and annoying for students, it is necessary to create safe spaces for teaching these topics. For example, these educational subjects can be provided to students in the form of pre-course plans so that students who are likely to have educational anxiety due to similar personal experiences will be exempted from participating in these courses. It should be noted that given the importance of coping with such emotional reactions for future physicians, supportive services should take steps to ensure that

these students receive the necessary training on how to cope with these issues [7, 19, 23]. Generation-Z students, due to the nature of critical behaviors, need more guidance in the learning process, especially for group interactions. Although Generation Z is a so-called “digital native” and has grown with technology, it prefers combined online activities designed in collaboration with another person. Since they are accustomed to online search, they can quickly synthesize information. In addition, they like to use educational materials that have not been introduced by their professors. When using educational materials provided by instructors, they prefer video presentations of lectures, simulations, and case studies rather than reading assignments. Therefore, teachers should consider these perspectives of learners in designing educational courses and curricula. The reason is that these topics in the form of a hidden and informal curriculum can have both positive and negative effects on the teaching-learning process [7, 19, 24].

Generation Z has sufficient skills to use technology in e-learning, but their limited attention span challenges their efforts to stay motivated and disciplined when learning online. Therefore, teachers can use the following recommendations to have the best online teaching performance for these students:

1. Strengthening student involvement in education

This strategy includes activities that teachers should consider when designing a course for Generation Z. Through these activities, students engage in strengthening the student-student and teacher-student communication through interactive discussions. For example, in online interactions, instead of using traditional textual discussions, technology should be used to provide students' answers in cyberspace. However, it is important to avoid using acronyms, informal language, and unreliable sites. For Generation-Z students, teamwork and joint projects are more attractive than individual assignments. Generation Z is labeled to have poor social

relations, weak communication skills, and being at risk of social isolation. On the contrary, they are sociable individuals who prefer working with others. Group projects create opportunities for developing necessary social skills and encourage students to communicate with their classmates, thus preventing social isolation that often occurs when working in cyberspace.

2. Stimulation of intellectual growth

Professors must create a critical learning environment through activities that include problem-solving and inquiry. This learning approach helps students think about their assumptions about course content, examine their thinking about topics, and involve them in problem-solving and ideation [25]. Online students should have a learning environment that helps them answer the questions posed by professors. Generation-Z students entering online learning need a facilitator to encourage them to use learning methods that fit their characteristics.

Another way to stimulate intellectual development is to use short videos to teach topics, followed by a question related to a real patient. Instructors can use available videos from various platforms or create their own short videos related to their topics [26]. Storytelling is another effective method in this field. Storytelling by teachers stimulates students' thinking and rethinking, and enables better understanding of the topics. Professors can prepare these stories by recording short interviews with their patients, creating podcasts, and then asking students to discuss the topic or do activities related to social problems (simply listening to the story is not interesting for students). The use of infographics is also helpful in this regard. These visual stories can easily be prepared by professors about the content of the course and made available to students. In order to engage students with the subject, they can be asked to identify the key elements of the discussion, or the students themselves can prepare an infographic. Since Generation-Z students have a tendency to be creative and entrepreneurial, their confrontation with social problems related to the educational subject and asking

them to provide solutions can help them in the learning process. Creating team competitions and giving digital certificates can make activities more attractive. Teachers can use approaches such as "Hackathon." Hackathon is often used to design software and involves expert teams intensively working together to come up with innovative solutions to problems. Students can participate in competitions similar to Hackathon to solve clinical problems. They can present their ideas and solutions to their classmates in online classes using podcasts, infographics, short videos, and virtual posters. These types of activities can help with teamwork spirit, creativity, problem-solving, and critical thinking skills [26, 27]. Audience response systems have been reported as the most desirable, attractive, and effective way of learning. Professors can use online polling activities such as pretest and self-assessment of course content to collect basic information about the students' level of knowledge and experience, and encourage them to reflect on course topics. These surveys can also be done after completing the course to assess students' comprehension of the subject. For example, students can create Twitter surveys on a cardiovascular health topic and receive feedback from others. Responses can be shared with classmates, compared to other Twitter survey responses, used for analytical processes, and used to stimulate students' thinking about issues.

3. Building relationships with students

Establishing a good relationship between professors and students is important, as it was in previous generations. The introduction of the course plan by professors and the feedback given by students typically form this relationship. Generation Z (i.e., the digital generation) provides short and fast forms of communication [28]. Therefore, instead of using traditional texts, professors can introduce themselves by producing a short audio or video message. During the semester, professors, as the students themselves, can send short text messages or use various programs such as Remind app to communicate with students. These methods are better than

the older methods (such as email) and are more desirable for students. Introducing students in the online environment also helps to build a better relationship. In this regard, students can also use pictures or videos to introduce themselves or even share interesting information about themselves, such as their favorite food and entertainment. Thus, better social relationships and better communication skills can be shaped. Another way to build a relationship is to provide feedback to students. Students of this generation prefer immediate and convenient results. Instead of reading text, they prefer specific examples and visual feedback. For example, to provide feedback, teachers can use an online whiteboard to identify homework problems and then provide images of modified examples. Recorded videos or short audio messages can also be used to give individual feedback and share more detailed examples than written comments.

In addition, the teacher can provide an infographic for the whole class on common mistakes in a task while highlighting the points that have been done correctly. General feedback on assignments can also be shared by creating animated video feedback. There are a variety of platforms available for professors to develop and share animated videos that can be appealing to their students. This generation of students wants professors who help them in their personal and professional development. Therefore, teachers should consider the specific characteristics of this generation and use methods appropriate to their learning needs. Instructors can share tips for success in online courses. This provides a useful guide for students and shows that student success is important for the faculty [27, 29].

CONCLUSION

Generation Z is different from other generations. They are intricately involved with technology and accustomed to doing multiple tasks simultaneously, which distinguishes them from previous generations. They are eager to learn, but in a way that suits the digital generation. Teachers can bridge the gap between their generation and Generation

Z by using modern teaching methods. However, these methods should be relevant to the needs of students in accordance with the real social environment; they should be more interactive and use fewer one-sided lectures. Only by creating a dynamic environment can professors help students become more effective learners and more useful people for society. Students' satisfaction increases when they can decide for themselves, work at their own pace, and receive guidance and support.

CONFLICT OF INTEREST STATEMENT

None declared.

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