

# Generation Z Students: Will They Change Our Computer Science and IT Classrooms?

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## ABSTRACT

The students who are age 21 years and below, born either in 1997 or after, are the ones belonging to the new category of Generation Z. Naturally, in regards to any other groups of generational cohorts, the Generation Z students have their unique and distinct characteristics which subsequently influence the approach that they have towards work and education. The paper presents information about the Generation Z students' personalities, their views about work and education, the need of information faculty to understand about the students, and the implications for computer science and IT educators.

**Keywords:** Generation Z, Computer Science and IT students, Computer Science and IT educators, Generation values, active learning, Higher education.

## 1. INTRODUCTION

The new generations of learners are different from the prior generation of students, and their response to instructions are not the same. The Generation Z students have been termed as the "screeners," "internet generation" and the "digital natives." They are the first generation of students to be born in an environment that is extremely internet-connected and tech-savvy. Generation Z uses all forms of technology and multimedia which have constituted to being seamless parts of their lives. Generation Z students simultaneously use different electronic devices including laptops, smartphones, tablets, and iPads allowing them to access information easily from any internet sources available (Ivanova & Ivanova, 2015).

## 2. CHARACTERISTICS OF GENERATION Z STUDENTS

The Generation Z students have a short span of attention. The Generation Z students have been subjected to the exposure of constant short segment streams of information and clips that rarely last beyond six seconds including the videos on YouTube and FaceBook posts. As argued by Ozkan & Solmaz (2017), the Generation Z learners, with the availability of online texts, are now spending approximately 8 seconds to pick keywords that are hyperlinked to assist them find answers instead of having to read the whole text, which translates to about 4 seconds per 250 words of the entire text. As a result, the Generation Z students have acquired a syndrome referred to as the "attention deficit disorder." Consequently, Generation Z has been determined to lack the ability to focus, concentrate, and pay attention to the problems that may seem longer or more involved and complicated.

The Generation Z students have increased visual development abilities. The visual learning forms through the use of videos, pictures, collaborative projects, and interactive games have been determined to be more effective and exciting for the Generation Z students. A study conducted by Chang & Guetl (2017) shows that the cognitive functions of Generation Z students' brains are different structurally from those of the earlier generations. The situation has been proven to have nothing related to genetics but rather has everything to do with the way the brain is used when responding to the occurrences in one's environment. Due to their digital environment, Generation Z students' brains have become wired in nature making to develop more complex and sophisticated visual imageries. As a result, the segments of the Generation Z students' brains responsible for the visual abilities are far much developed, and this makes the visual learning forms more involving and interesting. The

auditory forms of learning such as discussions and lectures are strongly disliked and considered boring by the Generation Z age group (Iorgulescu, 2016).

The Generation Z students have developed the expectation of constant feedback and instant results due to the ease of information accessibility. The Generation Z students expect immediate answers and do not always spend their time to verify the reliability or legitimacy of the sources found. Their familiarity with the digital technologies has impacted them positively making them view technology as something to be embraced but not feared. To these groups of students, they take both the opportunities and challenges of researching anything thing of their interests, mostly online. They are realist and creators making them never to be afraid to explore, experiment, and try new things. They are social and connect globally with people. They are accepting and tolerant of cultural and racial differences but are hungry for making their lives matter by being dedicated to looking for solutions, impacts, and answers. In this context, the Generation Z is the most ethnically, socially, and racially diverse in the history of U.S. with 5% being Asians, 14% Black, 19% Hispanic, and 61% Whites (Jacobsen & Forste, 2016).

However, besides the increased diversity and improved technology access that differentiates Generation Z from their predecessors, there are major cultural paradigm shifts in the world events and social norms that have shaped their values. Generation Z has been brought up amid the world markets' economic decline marking the Great Recession. They have seen their parents lose their businesses and jobs as well as their siblings moving back home due to economic difficulties. These situations experienced have made the Generation Z careful with their money and will avoid debt at all costs. They conduct diligent research to consider good investment and are less likely of making impulse purchases since they prefer to save their money over immediate spending. The Generation Z has experienced the 9/11 world dominated by the on-going reports of terrorist attacks. The Generation Z has grown up in school environments where horrific scales of violence are a common phenomenon (Young, 2016).

### **3. VIEWS OF GENERATION Z STUDENTS ABOUT WORK AND EDUCATION**

Forward-thinking companies, firms, and even small businesses acknowledge that characteristics of generations changes with time. The passion, drives, attitudes as well as weaknesses of each of the distinct generation influenced by the technological changes, political factors and the economic factors prevailing (Mesquita, Moreira, & Peres, 2017). These factors play a critical role in molding a new set of people who view the world from a different perspective than the generation before them. Research by the World Bank indicates that 75% of Generation Z in developed and developing countries view work as an opportunity for career progression (Mizintseva et al., 2017). The generation is known to have a strong entrepreneurial spirit and occasionally work industriously to succeed in whatever they do. Therefore, 60% of this generation knows that they have to work harder in their workplaces outshine others in the same profession to achieve career progression as well as satisfaction. The generation has contributed immensely in rescheduling work since they prefer being in officers only when there need to do so.

Generation Z students behave, think and learn differently as compared to the old generation. The change in their thinking as a result of the environment they grow full of technology and technological devices at their disposals. The technological devices enable them to acquire and familiarize themselves with diverse knowledge and ideas thanks to the presences of a lot of online research materials on different fields (Ding, Guan, & Yu, 2017). For these reasons, Generation Z views education as a mean of acquiring unique information or getting an explanation of a particular concept or learning more about a subject.

Generation Z agrees with the past academic scholars that education is the key to life. However, Generation Z is also concerned with the great education that entails many life skills and what the corporate world expect from them once they graduate from education centers. In their view, education should include both academic works in classrooms and sports. They view supported by the research that shows that 29% of students in junior schools, colleges and universities opts for the integration of sports activities at all levels of education. Similarly, only 29% of the Generation Z

opted for academics in schools with sports activities. These data show how this generation has divergent view on education. Finally, the academics that this generation opted for is one that equips them with a lot of practical skills in their line of profession. They based their arguments on a current trend in the market that opts in employing students with practical skills within their line of profession.

#### 4. TEACHING GENERATION Z STUDENTS

Teaching students of Generation Z are one of the interesting things in the learning institutions and at the same time can be as difficult and boring to the tutors. The students of this generation understand different dimensions of the world thanks to the presences of technological advances that allow them to acquire such information at their disposal (Reilly, 2016). The problem of handling these students comes in instances where the teacher still applies traditional methods of teaching which are obsolete. Generation Z students have short span concentration time in classroom caused by a lot of interferences from the use of technology and prior information acquired which might be relevant or irrelevant.

However, the application of appropriate technology machines with correct content and incorporation of interactive learning has enabled students to learn more effectively. Teachers should encourage such learning by creating online lessons rather than using traditional methods where students participate in just learning that creates boredom after a short duration. Students of Generation Z are access to technology and digital information right from birth and as a result, developing interactive classes is simple to use among them (Mohr, 2017). For active learning to occur among the students, teachers are at liberty to employ the right techniques to achieve this objective.

Scholars are of the view that digital disseminating information to the students is core to these students. Decades may have moved very quickly to do away with massive handouts teachers used to prepare for students (Reilly, 2016). However, for Generation Z, creating school or class portal is a better idea to allow storage of all the lecture notes as well as other e-books. Through the portal, Generation students who are used to getting information at any time will be in a position to access any of the learning

material at their expediency and print them if there is a need.

Since Generation Z finds more exigent or challenging to concentrate for long hours of learning, educators must find means of increasing these students' interaction and level of activeness in class or during lectures. Reducing lecture hours by breaking up some of the long lectures that go beyond two hours is a technique that can allow students to remain active. Creating such a break for discussion among the students allow them to recall what has just been taught and get more clarification from one another (Shatto & Erwin, 2016). By so doing, Generation Z students will maintain interest in the subject of discussion hence keep the class moving without impediments.

Barley(2016) suggests some advice that marketers must know about Generation Z; this advice can also be relevant for faculties that work with Generation Z students.

(1) Be real with Generation Z; Most of the students want to acquire value from their education and be prepared to be offered a job. They want to learn and hope to be mentored by faculty member continually through their education system. Therefore, instructors should also make sure that students understand the value of course content, projects, and assignments that can be related to their careers.

(2) Celebrate Generation Z diversity; Generation Z respects the diversity of race, ethnicity, and age, and they can relate well with fellow students and faculty from different generations.

(3) Be brief when communicating with Generation Z; Generation Z students have a very low attention span. Expecting students to focus on the same topic for an extended length of time will not hold the attention of Generation Z students. They love to be engaged with various videos and Youtube channels, also are huge fans of live-streaming. Instructors should talk briefly about content and then allow students to apply the information that they have learned and also provide opportunities for the students to use their knowledge in real-world experience settings.

(4) Remain focused on the basics of Generation Z. Students need to be good critical thinkers and to make the right decisions throughout their life.

Research reveals that Generation Z students may not pay as much attention to detail as they should, faculty needs to help and develop activities that help students learn how to think critically, and able to use their critical thinking skills in their work as well as their life.

## **5. IMPLICATIONS FOR COMPUTER SCIENCE AND IT EDUCATORS**

The high demand for IT experts in the workplace has gradually risen over the last three decades, and the possession of such knowledge strongly gains a competitive advantage in the global market. Networking and e-commerce are two specific areas where demand for IT professional is constantly growing. The demand is a global phenomenon since most of the international organization offers most of their services online (Hazzan, Lapidot, & Ragonis, 2015). The same trend is also witnessed in learning institutions right from preparatory schools to university. The implications of studying computer science in schools are felt currently in all sectors of the economy. The trend has compelled IT educators to improve their professionalism to deliver and teach new students in the IT field on the best techniques required in the market. Rajabion(2016). Generation Z students have more preferences for more practical and active learning classroom environments. Some of the teaching methodologies such as simulation, problem-based learning, games, case studies, and group activities will need to be part of the course plans.

Globally, the implications of computer science various in key sectors economy ranging from education, health, business, and transport and the IT educators must note the trend in those areas (Hulsmann, 2016). Knowledge revolution taking place in the education sector combined with the globalization of the economy has created conditions where countries shift to the industrial based knowledge that allows their personnel to have a competitive advantage. Computerization of the industries has forced education sector to focus on producing labor force with computer literacy (Hulsmann, 2016). Due to the computerization process, the IT educators are under pressure and obligation of developing better techniques of teaching ICT in schools.

Also, IT offers better means of enhancing standards of learning among students, developing IT educators' professional capability as well as strengthening learning institutions capabilities. The use of computer-aided application assists students in learning by giving instant feedback or solution to some of the problems they might come across in the learning process. For instance, computer conferencing allows students to interact online actively (Zhang, Van Donk, & van der Vaart, 2016). Even though the introduction of IT in different fields is advantageous, the cost implication of maintaining ICT systems in different sectors is too expensive. Secondly, ICT has exposed several organizations to a harmful threat of cyber-hacking. Most organizations spent many resources in developing firewalls to protect their data and information from leakage. Despite the efforts, some hackers bypass the security systems installed by the organization to retrieve crucial information without the management knowledge. Therefore, IT educators and ICT experts are under pressure of devising new method or techniques to mitigate and prevent illegal access to information from organizations by hackers.

## **6. CONCLUSIONS**

Generation Z, just as the previous generations, has unique characteristics which subsequently influence their ways of approaching work, education, and social relationship. The Veterans and Baby boomers influenced politics, Generation Y changed work, and Generation X changed the family. Similarly, Generation Z is considered to bring changes and create a significant impact on our education from the aspects of course contents, learning objectives, and teaching methods in our computer science and IT classrooms. To help the Generation Z students maximize their skills and professional potential, it is necessary that the educators understand the history shaping the perspective of Generation Z. The educators should create opportunities that can leverage the uniqueness of the Generation Z students in computer science and IT classrooms for positive outcomes. Career counselors should help these Generation Z job seekers identify their set of values to help them match with future employers. Educators can inspire them by posing complex, real-life problems, and provide feedback, early on in the process and in an efficient manner. The students get

motivated if the educators also can tap into their enter entrepreneurial spirit.

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