

Industrial Design Education: A Research on Generation Theories and Change in Turkey

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Abstract

Due to their birth at the same time interval, according to the generation theories based on the idea that the individuals who were exposed to the same social, historical, and cultural events and thus have common experiences, similar attitudes to similar thoughts and behaviors, nowadays five generations, which are the Silent Generation, Baby Boomer, X, Y and Z Generations, live together. Each of these generations exhibits different tendencies in matters of work, family, and education because they encounter with different historical events, social relations and technological developments that help to see and make sense life from a different angle. Considering the individual who performs the design action and is affected by it, and relationship with the social structure due to the nature of the design, it is thought that generational differences will create similar differences in the approach to design action. Therefore, design education as a reflection of design practice will be affected by this difference. Thus, in this study to examine the change dynamics of industrial design education in Turkey within generations theories, in-depth interviews were conducted with different generations' lecturers working in departments of industrial design in Turkey and data were compared within the framework of generations' theories. As a result of the study, it was seen that changes in education parallel with characteristics of the generations due to changes of the generation of both the lecturers and the students. It also put forward the importance of being able to create a structure of education that is open to support changes.

Keywords

Generation Theories, Design Education, Generation Difference

Introduction

As well as the use of the concept of generations which draws attention to generational differences in social life throughout history, it is used in academic areas such as sociology, psychology, philosophy, political science, and demography. The sociological meaning used in this study describes individuals born in the same period, affected by the same historical events and who have common characteristics with their common experience. According to Jaeger (1985), interest in generations research began to examine how generations' historical movements and changes were actualized. Subsequently it gained popularity with the development of technology and the information age. With increasing interest, generational theories have been handled by different authors and used to explain human behavior in different fields. The studies reached within the scope of this study were classified as shown in Figure 1 and a concept map related to the field of generational theories was created. The first scientific research on generations started with Comte, and the flow of regular publications started with the work of Francois Montre (Jaeger, 1985). In this sense, two important contributions to generations studies were provided by Karl Mannheim (1928) and Jose Ortega y

Gasset (1923). In the recent past the generation theory developed by Strauss and Howe (1991) brings a new perspective to generational studies. As seen in Figure 1, many studies have been carried out on the basis that these authors built.

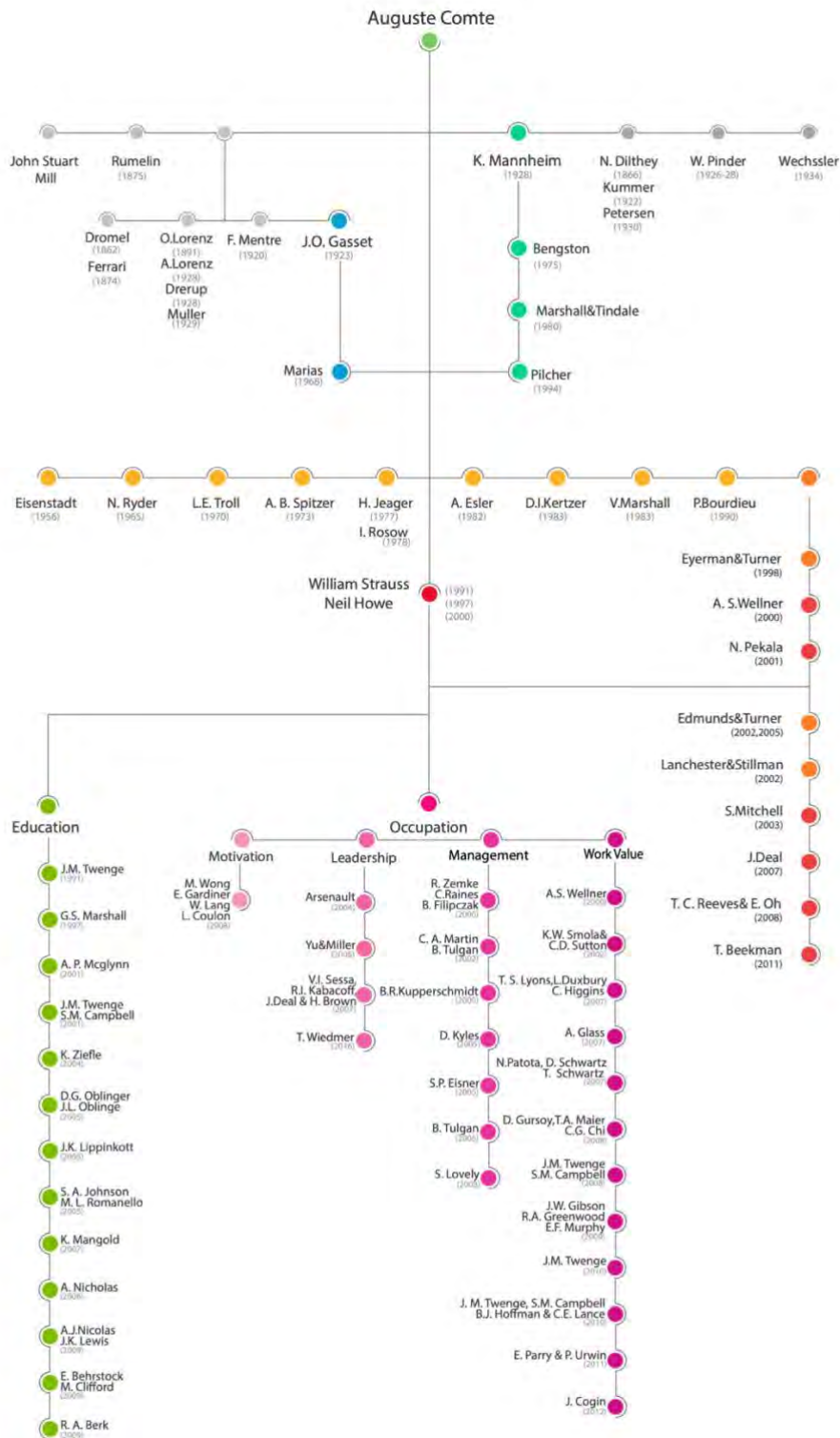


Fig. 1 Generation Theories Conceptual Field Map

According to generation classifications, five different generations, that are the Silent Generation, Baby Boomer, X, Y and Z Generation, live together nowadays. Each of these generations has different characteristics, attitudes and behaviors shaped by different historical events and experiences. As seen in Figure 1, the range of research related to these differences has diversified in recent years such as business values, motivational factors, education life, approach to technology and consumer behavior. However, despite popularity of the subject, relatively little academic work has been done on the verification or rejection of generational differences (Cennamo & Gardner 2008; Lyons et al. 2007; Sessa et al. 2007).

Generation theories make an important contribution to theoretical framework of this study and set boundaries when dealing with changes of industrial design education because it reveals the differences between generations by determining the reasons for each generation to develop their own identity. While varying living conditions, culture, social environment, technology, user expectations and consumer characteristics created changes in design discipline, social and historical events change individuals who realize designs and expect to benefit from this. Therefore, the change in the qualities of the individual who realizes a design and expects benefit from it will create differences in the approach to the design action. As a reflection of this, we think that design education will be affected by this change. According to Prensky (2001), educators today strive to communicate with students who speak different languages, and design of the current education system is not suitable for present-day students. In design education based on a master-apprentice relationship, communication between the lecturer and the student requires a lot of attention. Design education is characterized by continuous dialogue; students learn to share information during communication with each other, a lecturer, or jury members. Since the quality of this communication is related to different experiences, educational life, learning approaches, communication styles, social features and business values of each generation, generational differences are manifested by one-to-one interaction in design education. At the same time, the change in the human resources of the departments depending on the demographic characteristics brings together individuals from different generations to work together and to be in contact with students from different generations. At this point, understanding the generational differences is important for design education, especially to increase the quality of communication with students. According to Chen (2016), how to increase communication, interaction and efficiency between instructors and students is worth studying. Nowadays, most university students who are the subject of this communication are Generation Z who are relatively new to higher education and Generation Y. However, In Turkey, although most of the human resource of departments of industrial design is Generation X, the academic staff is also composed of Silent Generation, Baby Boomer and Generation Y.

In addition to generations of students and instructors changing, design practices are also changing to find solutions to new problems and questions with new epistemologies and ontologies that will help us understand current situations (Forlano, 2017). This change directly affects design education and requires new and flexible models that can deal with future practitioners' needs, unknown markets, and new cultures (Moreira et al., 2016). Until the mid-90s, in industrial design education, whereas the design studio model that evolved from the Bauhaus continued, subjects such as market research, materials and production techniques, graphic design, computer-aided drawing and ergonomics were included (Budd 2011). With the promoting of mobile technologies and understanding that the value of design was not only

related to concrete objects but also to its role of shaping experience and lifestyle surrounding products, in 2000s the emphasis on the relationship of design with human and social effects of digital technologies created new goals and outcome for design. Since the mid-2000s, topics such as participatory design studies, design research, sensor technologies and programming for interaction have been included in design education (Budd 2011). New applications emerged with developing digital and mobile technologies that affected design culture and caused design education to change too. With the including of technological tools in design education, virtual design studios, distance design education programs, interdisciplinary and multidisciplinary applications have started to come into question. Online education practices have become an increasing trend in design education (see Chen & You 2010; Renda & Kuys 2015; Toh et al. 2015). With the development of technology and rise of the network society, resources that students feed have diversified. In addition to traditional resources, student learning has been increased through social media (Renda & Kuys 2015). As design education progresses towards a networked mentality of different knowledge areas and levels of interaction, a sociological approach to education is required. In this context, it is aimed to examine the change in industrial design education within the framework of generational theories, depending on both the change of generations of students and the diversification of the human resources of the departments with individuals from different generations. And thus, it can show how design education can be more productive for the new generations, by understanding the features of industrial design education that make learning more meaningful and effective, along with the educational values of different generations. At the same time, it is aimed to contribute to the understanding of individuals from different generations to increase the quality of communication, which is important in design education based on the master-apprentice relationship. Thereby we think that this study which focused on the different approaches that shaped design education of different generations of students and lecturers contributes to understanding communication between lecturers and students, and students' learning processes and learning resources.

Theory of generations

Mannheim (1952), associating concept of generation with concept of class, used the concept of generation to define people who share similar experiences, share common values and culture in same age group in a common position in the historical and social context. Thusly, a generation refers to an identifiable group that shares the years of birth, age position, and shares important events experienced during critical developmental periods of a society (Kupperschmidt, 2000). Accordingly, it is a social creation rather than a biological necessity (Sessa et al. 2007). According to Strauss and Howe (1997), it is the sum of people who born at the same time, share a common place in history and thus have a common personality. Therefore, individuals born in the same historical period and socio-cultural context have similar thought structures, experiences, and behaviors with effect of the same historical, political, economic, and social events, and each generation creates its own generation personality with impressions of shared experiences in their youth years. (Mannheim, 1952). According to Zemke et al. (2000), a defining moment that captures the attention and emotions of millions of individuals during the formation phase of a generation helps to identify the characteristics of a generation. Wars, communal, cultural, social, political, and economic changes, and technological developments are examples of these important events (Zemke et al., 2000). Thanks to these events, each generation shares a common past that creates similarities.

Similarly, generational differences are the result of different historical conditions experienced by generations (Smola & Sutton, 2002).

Generation researchers classify generations by focusing on the factors that cause generation differences which individuals encounter depending on their year of birth. With these classifications, generations are named with a name suitable to the generation identity which they have acquired depending on the defining moments they have lived (see Table 1). In addition, date intervals for the birth years of generations are defined differently by different authors according to the period, society, individuals, and events encountered (Reeves and Oh 2008). Strauss and Howe (1991) determined the boundaries of generations by year of birth and used the life stages a person passes through to help define the length of a generation. Thus, the length of a generation cohort is defined in periods of twenty two years. But there is no definite limit defined for the transition from one generation to the next when classifying the generation. Depending on the events they experience, the thoughts and behaviors of the members of a generation, as well as their value judgments and attitudes, helps researchers understand the boundary between generations. The historical position of a generation is determined by important historical events, social messages, family structure and technological developments that occur in childhood and early adulthood (Arsenault 2004; Kupperschmidt 2000; Strauss & Howe 1991, 2000; Zemke et al., 2000). According to Strauss and Howe (1991), generations bear a unique signature of past moments. In this way, individuals who were born in the same period and shared a common time in history, constitute a generational personality with important events, beliefs and attitudes that affect them especially in adolescence and early adulthood, defined as the years of formation. The concept of generational identity gains importance for effective definition, recognition and understanding of each new generation (Codrington & Grant-Marshall, 2011). A generation's identity is the set of common behaviors and attitudes that a generation displays throughout its life cycle (Strauss & Howe, 1991). Generational personality is used to define a generation and find the boundary that separates it from other generations. According to Zemke et al. (2000), although every individual does not fully fit the personality profile of their generation, all members of a generation are deeply affected by their generational personality. Even so, when generalizing about a generation, possible definitions and classifications are made with the assumption that not every individual in this generation will necessarily show the same tendencies (Strauss & Howe, 1991).

According to most researchers, country, and national culture play an important role in generational classification and generational identity is shaped by the cultural structure of a society. However, with the increase in communication and interaction through technological advances, global generations emerge (Edmunds & Turner, 2005). According to researchers who advocate the existence of the global generation concept, young people belonging to one generation are more similar to each other day by day (Lower, 2008). Generational similarities reduce differences related to race, ethnicity, or economic components. On the other hand, the differences between the generations become more evident due to changing social structures and technological advances. This situation shortens the length of the generations and causes them to be separated from each other with clearer boundaries. In this context, the different generation characteristics encountered in accordance with the generation classifications are presented as in Table 1 within the scope of the literature reached in this study.

Table.1 Generational Features

Generations	Silent Generation	Baby Boomer	Generation X	Generation Y	Generation Z
Date of birth	1925-1945	1946-1964	1965-1980	1981-2000	2001>
Formative Events	War and economic instability	Economic growth and prosperity Developing education system Increasing urbanization and social change	Familial, social, and financial insecurity Diversity Lack of strict traditions Technology and information Increasing divorce rates	Technological advances Terrorist attacks Violence Income inequality	Culture that with high technology products and social networks Demanding and impatient Wars Terrorism
Family	Traditional immediate family	Traditional concerned family Spoiled child	Divorced parents Working parents Neglected children	Helicopter parents Protected child who consults and trusts his family in all matters	Second type helicopter parents that is extremely interested, doing whatever their children want Older parents
Characteristic Features	Loyal Formal Well-disciplined Patient Devoted Unselfish Thrifty Compatible Obedient Hardworking Honorable Patriot Respectful to authority Depending on traditions and moral values	Optimist Idealist Selfish Rebel Prescient Competitive Ambitious Career-oriented Workaholic Rational Contender Responsible Questioner the status quo	Skeptical Wry Skilled Informal Confident Self-contained Sensible Accommodating Compliant Self-reliant Fun-oriented Creative Pragmatic Tolerant to differences Suspecting and questioning of authority	Realistic Optimistic Global Ambitious Technology-prone Good team-player Success and fun focused Selfish, Confident Social Conscious Open-minded Impatient Demanding Result-oriented Tolerance to differences Willing to take responsibility to make change and difference Accepting authority but does not trusting	Global Technology-dependent Loyal Thoughtful Compassionate Open-minded Result-oriented Good-natured Diligent, Innocent Risk-avoiding Individualistic Innovator Impatient Discontented Creative Tolerant to differences High-motor skills Lack of social skills Emotionally fragile
Values	Work hard Do with less Moral values Customs, and traditions	Idealism Health and wellness Self-improvement Personal pleasures	Resisting their parents Freedom	Moral values Race and ethnic diversity	Race and ethnic diversity Supporting the disadvantaged population
Attitude	Control-command Sacrifice	Optimism Workaholic Materialist Believing that you can change the world	Skeptical Independent Not belonging to any group Focus on multiple goals	Hopeful The rules are for breaking	Diligent
Technology Perspectives	No technology, no adaptation Uses for very rare work	Far from technology adaptability difficult Technologically conservative Uses for work when needed	Compatible with technology Technology provides convenience Uses often for business and social life	Indispensable, High relationship with technology, growing up with it Uses in business and social life for your needs	Technology is an important part of natural life 24/7 online Uses to meet all kinds of requirements
Communication Preferences	Face to face by Phone	Face to face by Phone	Email SMS	Email, SMS Instant message Social networks	Instant message Social networks 24/7 online
Learning Characteristics	Disciplined Very strict education system	Learning in the lesson	Fast and efficient learning	Based on search engines Experiential	Result-oriented Impatient Multitasking

	High educational success	Learning with individual experience The best learning if the topic is of interest Freedom of expression Waiting for positive support for their efforts Formal Structural Technical Data/Evidence based Lifelong learning	Learning the things that will benefit Flexible learning times Practical Educational Comfortable Interactive Applied Case-based They don't want to spend time Learning something they don't need	Kinesthetic Short attention span Impatient Visual literate Communication expectation Weak time management Frequent and short-term feedback expectations Success and grade-oriented Want learning with real life experiences Bored from traditional teaching methods	Lack of attention, Effective use of technology Personalized learning with graphics Primary source internet Education at home before school Longer education Instruction and guidance expectation They feel pressure for success and are afraid to disappoint others He wants to make a difference, but not determined
Learning Environment	Class	Class, Calm environments	Comfortable environments	Whenever they want, wherever they want	Distance learning
Suitable Learning Activities	Keep to strict rules	Detailed information Take notes Personal stories about the subject of the lesson	Independent learning Detailed study guides and test comments that focus on how to test	Activities related to real world Creative, innovative, interactive exercises Group activities Technological innovations Programmed instructions	Activities that trigger creativity Dramatization Storytelling Use of technology Focus on visual elements Clear homework definitions
Work Values	Live to work Avoiding risk Follow the rules Work hard Mission before fun Strong work ethic Job security Long-term career Long hours linear operation at the place and time expected from him Formal and one-to-one relationships with colleagues Honest business honest salary	Living to work Workaholic Competitive Idealist Respectful to Hierarchy Personal development and job security Permanent and strong business ethics Education for business success A showy career Seniority-based promotion Proving yourself by working long hours in the office Face-to-face formal communication Personal relationships with colleagues	Work to live Unfaithful Creative Entrepreneur Result-oriented Fun at work Instant feedback and rewarding Lifelong learning Career options evaluation Workplace; office, home, Flexible working style and less hierarchical structure, seeing colleagues as friends Direct and electronic communication	Work-life balance Entrepreneur Innovative Multitasking Working with fun Education at work Advanced technology Multi-career Getting more experience before work life Short-term and flexible work Determining the place and time of work Communication with informal Social relationships with colleagues Expect immediate feedback and appreciation	Frequent job changes are expected Working wherever and whenever they want
Teamwork	They like to work with loyal teammates accompanied by a strong leader and when told what to do	They like teamwork collaboration, and decision-making, but they are afraid of losing their place in the team	Doesn't like teamwork Want to be evaluated with their own performance	Like collaboration and teamwork Like diversity	Not suitable for teamwork

Source: (Arsenault, 2004; Beekman, 2011; Berk, 2009; Codrington, 2008; Cugin, 2012; Deal, 2007; Dziuban et al., 2005; Eisner, 2005; Gibson et al., 2009; Glass, 2007; Hampton & Keys, 2017; Howe & Strauss, 2000, 2007; Johnson & Romanello, 2005; Kupperschmidt, 2000; Lancaster, 2004; Lancaster & Stillman, 2002; Levickaite, 2010; Lyons et al., 2007; Lyons & Kuron, 2014; Mangold, 2007; Martin & Tulgan, 2002; Mcglynn, 2001; Mohr & Mohr, 2017; Nicholas, 2009; Oblinger & Oblinger, 2005; Parry & Urwin, 2011; Pekala, 2001; Prensky, 2001; Reeves & Oh, 2008; Sessa et al., 2007; Smola & Sutton, 2002; Strauss & Howe, 1991, 1997; Sullivan et al., 1997, 2009; Tapscott, 1998, 2009; Tolbize, 2008; Twenge, 2009; Twenge et al., 2010; Wiedmer, 2015; Zemke et al., 2000; Zopiatis et al., 2012;).

Method

The aim of this research is to examine the change of industrial design education depending on both the generations of students and the diversification of departments' human resources with individuals from different generations. Accordingly, first the infrastructure of research has been established examining concepts, theories and past studies related to the research topic. Studies addressed generational differences in the academic field were conducted with the help of interviews, focus group studies, surveys, and meta-analysis methods. When handling the structure of studies using qualitative research techniques (see Arsenault, 2004; Broadbridge et al., 2007; Gursoy et al., 2008; Kunreuther, 2003; Nicholas & Lewis, 2009; Rodriguez et al., 2014) among the studies examined within the scope of the literature research and the quality of the data obtained, it was concluded that qualitative research techniques, which are preferred to systematically examine the meanings arising from experiences of individuals (Ekiz, 2003), are a suitable method in order to understand the values, attitudes and thoughts of individuals from different generations towards education in this study. Thus, primarily human resources of the department of industrial design in Turkey were determined. Then, by using the purposeful sampling model (Maxwell, 1996) which aims to collect in-depth information about the event, situation or person that is the subject of the research in line with a purpose and the semi-structured interview technique, interviews were conducted with the academic personal as it was thought that they could competently evaluate the change in education over a long-term. Selection of participants was carried out with the inclusion of enough academic staff from each generation, after determining the human resources of the departments. Yet, parallel to the general structure of the human resources of the departments, most of the participants were Generation X lecturers. The most important criterion in determining the participants was that the undergraduate graduation of the instructor is industrial design. This was considered to be important for the participant to be able to evaluate his/her own student status, the current educational process and student profile. However, due to the founding faculty members in Turkey containing graduates from architecture or interior design, in order to better understand the process since education started, exceptions were made, even if participants were not a graduate of industrial design but had worked in the department throughout his/her career. In addition, while selecting the participants, attention was paid to their active work in universities to discuss current education dynamics. But, for the reasons stated above, two retired academic staff were also interviewed. In addition, the diversity of the institutions where the participants graduated and worked was also taken into consideration. For the interview, an invitation letter and interview questions were sent to the instructor by e-mail. Instructors, who could not be reached via e-mail, were reached by phone and an appointment was requested. This process was repeated to get enough participants. Thus, interviews were had with 24 academic staff who responded positively to the interview request. 16.7% of the participants were Silent

Generation, 25% was Baby Boomer, 50% was Generation X, and 8.3% were members of Generation Y.

With the interviews, it was aimed to get the opinions of individuals from different generations about the change of design education based on students, curriculum, and instructors. Interviews for this purpose consisted of 13 open-ended questions: change in student profile, curriculum changes and teaching methods, and work-related attitudes and behaviors of different generations of academicians. During the interview, first, information was given about the purpose of the research and the scope of the subject. On the interviews, the order in the questionnaire was adhered to, but was flexible about the answers of the interviewee. The interviews were conducted with twenty-four lecturers from fourteen different universities in four different cities, namely Istanbul, Ankara, Izmir, and Eskisehir. Twenty-three of the interviews were conducted face-to-face and at the participant's workplace. One interview was made via Skype. In addition, at the request of two participants working in the same institution, a meeting was held with two faculty members at the same time. Interview times ranged from approximately 45 minutes to 2.5 hours. The interviews were recorded with a tape recorder, with the permission of the participants. Since one interviewer did not give consent to be recorded, the data were recorded by taking notes during the interview.

During the analysis phase, the audio recordings were analyzed and written down by the researcher. The analysis of the obtained data was carried out with descriptive analysis and content analysis method using NVivo12 Qualitative Data Analysis Program. In the analysis process, first, to examine the issues covered by the data from a holistic perspective and to determine the prominent points in the interviews, the interview records transcribed in writing were examined in detail. Then, appropriate themes were assigned to sentences or passages, considering the questions asked. In order to systematically encode the data and to see the connections between different parts of the data, the written interview records were transferred to the NVivo12 program, the themes were determined, and the coding process was performed. First, the answers of the same generation lecturers were grouped and then the classification was made according to the determined themes. After the first coding process was completed, the quotations under the same code were read again and if necessary new codes were assigned, similar codes were combined, or the places of the quotations were changed. As a result, the results were organized systematically, quotations representing the results related to the context were selected and the codes were supported.

Results

Education Approaches

It is the first common opinion that the most important factor affecting the approaches of generations in university education is the quality of their pre-university education. It is thought by the participants that the pre-university education of the Silent Generation and the Baby Boomer Generation is more qualified, and this is reflected in their university education. Another point those lecturers emphasized was the role of students and lecturers in education. It was stated that a more student-centered education approach was adopted in line with the approaches of Generation Y students and Generation X instructors. While A Generation X participant said, "In our time, the teacher had more power. Now the student is in the foreground. So, the lecturer has to think. If I do this, how does the student behave... Something is done considering the student's reaction.". Another point expressed is that the Generation Y

students wait for more instructions and avoid taking initiative. A Generation X participant expressed this general opinion as: "Students have become more demanding. So they said, give us more information, how we will design it. This happens by saying that the student cannot take the initiative, let's direct them..." The participants of the Silent Generation and Baby Boomer stated that they were more demanding in terms of information when they were students. A Silent Generation participant stated this situation as: "...there is no demander, like the difference between student and pupil. So, they don't demand." Another point that the participants emphasized is the expectation of the new generation students to set out defined rules. A participant in the Baby Boom Generation expressed this expectation of the students as "For example, one of the desired things in recent years is books... It is the first time in my 36 years of professional life that I encounter groups of people who request books...". In addition, there was another common view that current students showed a result-oriented approach. A Baby Boomer Generation participant said, "...In our time we were process oriented, learning was more important than results. Now the results are important... they want to ignore the fact that design education is a dedication, a process, and in terms of its requirements, it includes more work, the processes of working together in a fast, collaborative and hands-on manner." expressed in the form. Another member of the Baby Boomer Generation spoke of his student life, "In our time, the student was responsible for learning. His goal was to learn. He said I did not learn this lesson well this semester, I would take this course again next year. Because the learning focus was process-oriented. The current ones are results oriented." A Silent Generation lecturer who believes that the education system has become less disciplined in this way said: "The idea that students' demands will decrease when an oppressive order comes is very wrong. On the contrary, if the pressure increases, the demand increases. The student demands something that does not exist, it is a beautiful thing. The only thing that can carry his teacher forward is the student, no other factor..." Therefore, the Silent Generation, who grew up in a strict education system, believes that this lack has negative consequences. In addition, from the answers of the lecturers, it was understood that the previous generations saw design education as a way to realize themselves. A Generation X participant said, "'Ours was more of an existence. Here, however is a 'Survivor' situation, the captain who saved his ship..."

Research

Although data on the attitude of the Silent Generation towards research could not be obtained, the general opinion of Baby Boomer and Generation X instructors is that the students' desire for research decreases with the transition to Generation Y. Participants think that the biggest factor in this regard is technology, that the relations of new generation with technology provide easier access to information but these generations are reluctant to evaluate it. A Generation X member said, "So the information is always there. You can reach it whenever you want. Maybe there's a relief that he gives right now... Maybe it's more difficult because you have access to a very wide range of information. So, you have to scan through all that information." and drew attention to a difficulty experienced by the students during the research phase. Another common opinion was that the students did not question the reliability of the information they obtained over the internet and needed guidance in distinguishing reliable information. Another common attitude about the research has been the gradual decrease in the understanding with meeting with the user, observing and identifying the problems in this way, in the studio lessons. A Generation X instructor expressed this common opinion as follows: "Now everything is on the internet. There we encounter all the miracles, all the truths. And so everything is based on getting the result the easy way with the least amount of hassle." A Baby Boomer Generation

participant talked about his student period and that this situation is gradually decreasing as follows: "It was more research-oriented in the past. There are more possibilities for research now, communication is much more important... In our time, it will be produced, is it produced, where is it produced, who produces it, how much is it produced, what are the conditions for production, you would research everything. Today, there is a more productive environment such as the internet, it is more common than before, but the students are not willing..."

Communication

The expressions of the instructors revealed that the development of communication technologies and the ability of new generations to use them differentiated the interaction between students and instructors. While the lecturers of Silent Generation and Baby Boomer stated that they prefer face-to-face communication, Generation X lecturers also stated that they preferred e-mail to communicate with students regarding the lessons. The opinions of the participants revealed that the new generation want to communicate with digital technologies anywhere and anytime. In particular, Generation X lecturers stated that they have created certain platforms to give criticism over social networks in order to satisfy this need of Generation Y, who expect immediate feedback on any issue related to education. Instructors also stated that Generation Y students could follow an event, a designer or be aware of educational opportunities anywhere in the world through social networks. In addition to this, another common view expressed by the instructors was that, in parallel with the view that they communicate and socialize through technology, the interaction of students at different universities with each other increased and they also used this to conduct joint studies. A generation X instructor said: "Actually, they want to take the initiative. They want to do something, and they use technology for that. They are doing workshops. Students from different universities come together... In our time, everyone used to do something in their own school."

Learning Environment

Lecturers agree that classroom study habits are gradually decreasing, and Generation Y students expect flexibility in their decision to work wherever and whenever they want. A Baby Boomer lecturer said, "There is a student profile who does not say that I will do it here and that I do it wherever it is." Another Baby Boomer participant said, "I cannot follow the habit of working in the classroom as I used to. So, it is not possible to keep children here". Participants think that the most important factor that triggers this habit of students is the communication established through technology. A Generation X participant said, "Now students actually think that everything in life is actually a YouTube video, and they can do it by watching it". In addition, it has been frequently stated that internships, competitions, workshops, student exchange programs and student communities create an alternative learning environment for Generation Y students.

Technology Impact

The responses of the lecturers revealed that technology creates a lack of concentration, especially for Generation Y, but enables multitasking. A Generation Y instructor explained the students' lack of concentration due to technology as follow: "They certainly can't adapt. You will draw a sketch, but as soon as you put the phone next to them, the event ends. Because something is constantly burning from there. When we talk among ourselves, we see the biggest problem in the absence of a line of thought. Because he has a phone in classes, and the

moment he looks at it, he stops listening to you." It is frequently stated that technology is a part of the education life of these students and the tools and equipment used by students change. While a Baby Boomer lecturer express the general view on this subject as follows: "Of course, they are more open to technology, so it's a part of their lives. They also use it for education. I mean, for example, nobody takes notes anymore, takes photos of what we write on the board...", A Generation X lecturer said: "I call the programs used by the students a holy program. When the Holy program does not allow, you cannot do anything. Of course, the tools in your hand direct the designs of the current students, but in our time, our imagination was your guide. Because you were drawing by hand. But now he can't do the model... the program didn't allow it or says it didn't happen while modeling here". However, most of the lecturers stated that technology changes the learning environment of students and new generation students prefer an independent learning style. In addition, the other common opinion expressed by the instructors was that the changes in the technologies experienced by the current students and their interactions with the products created a dilemma for design education, that they differed from previous generations in terms of looking at products, and that the changes in education did not occur as rapidly as technological advances. Therefore, it has been revealed that students need instructors who can mediate with technological developments in order to keep up with this, and that instructors need to update themselves. A Baby Boomer Generation instructor said, "Some exercises that we can accept as educational trainers are no longer valid. Because that technology no longer exists. Even if we reveal this, it does nothing but alienate students. Dysfunction arises, motivation falls..."

Study Skills

From the expressions of the lecturers, it was understood that during the transition from Silent Generation students to Generation Y students, shortened their concentration time, increased multitasking habits, and especially the close relationship of Generation Y with technology was effective in this case. While a Generation X participant said about students' multitasking skills as follows, "...They use the program with their laptops. At the same time, they surf on the internet with their tablets. They also hang out on social media with their smart phones..." another Generation X instructor said, "Previously, students were able to concentrate on one thing and do it... Now, there are so many options, and I think they just scatter through them little by little without doing any of them completely." Another topic pointed out by the instructors is that students' time planning and discipline skills gradually weaken. A Generation X participant expressed the consensus on this issue with the statement "They do not use the time properly, they cannot manage the process...In other words, most of them do not have the ability to live with rules and discipline". In the transition of students from the Silent Generation to the Generation Z, another issue the academic staff underlined was that, willing to spend time while doing a job gradually decreased. A Generation X lecturer said, "The convenience, demanding life and being easy to achieve results in life, have also reduced the effort in the operation of a project". Another issue raised regarding working skills is group work. According to the majority of the participants, Generation Y students are not prone to group work due to their individual attitudes compared to other generations. A Generation X participant said, "Group work becomes increasingly difficult at the point where so many different people, lifestyles and everyone come together with a strange certainty." As a Generation Y lecturer said, "I see that they approach them individually. Maybe after our competitive education system in high school, individuality is very dominant here as well. Frankly, we have a hard time breaking it. So I see that they are not very inclined in the group project."

Education System and Curriculum

According to the statements of the lecturers, it was understood that the changes in the education system and the curriculum were shaped deliberately and slowly with little effect, according to the student profile. While a participant from Baby Boomer, expressed this situation as follow: "The change of the student is also a data for the design education here.", instructors think that it varies more depending on the structure of the university and its human resources. However, considering the factors affecting design education and educational strategies, it was a shared idea among all participants that education should adapt itself. A Silent Generation lecturer comment: "It is not possible for you to think as you thought in the 70s and 80s and to plan your education accordingly. Lifestyle and working conditions have changed, speed has entered life. Design thinking, that is, design work is changing depending on what comes up when analyzing the needs of the user. Accordingly, education should of course be re-planned." As too, a Generation X lecturer said: "Actually, generations of students change, and this registration is taken... It becomes the general characteristic of the incoming student, that is, of a generation, and that characteristic shapes how you will carry out your program."

Courses and Methods of Teaching

According to the lecturers, changes in the education system are due to new topics on the agenda in the field of design in the world, Turkey's local conditions, changes in the expertise of human resources, and the current student profile. And it takes place on a course basis depending on the content and rarely on the teaching method. A Generation X lecturer said this consensus was "It is necessary to change it somehow. But it's more about the course names and contents. There are no radical changes in the way of teaching. I can only see topics changing. A new generation should come after us. So, we are still using Generation X methods, changing the subjects". In addition, it has been frequently stated that the change of design tools and production methods due to the development of technology has an effect on the change of lessons. A Generation X participant said: "The design history, design sociology course may not be updated very much. But the material lesson, the production methods lesson is changing. Because in this sense, life is changing, life patterns are changing, instructional systems and engineering are changing". Another Generation X lecturer said: "Technical drawing is changing. Computer classes are changing. The material and production technology courses changing. There are also unchanging lessons. The basic design does not change. Because the fundamental in the design does not change, so there is no new perspective. Therefore, the critical thing among the changing lessons and the unchanged lessons is technology. The lessons that it influenced develop or disappear, something else takes their place, but the lessons that it does not affect do not change." Lecturers, regarding course changes also stated that since the early 2000s, courses related to computer programs, multimedia design, research for the product, user research, design methods, service design, robotics and ardinio related courses have been tried to be included in the education programs.

Studio Lessons

Project Topics

In the studio lessons, it was seen that the projects were mostly shaped according to the trends in the world and new subjects included in the design practice were reflected in the project subjects. As a result of the responses of the participants, it was revealed that the issues on the agenda in the projects were directed towards service design, interaction design, experience design, system design, designs for the social field and interdisciplinary studies. The most

important factor in the change of project topics has been technology. A Generation X instructor reflects general view by saying: "Of course, the subjects of industrial design as a field of science have changed. In other words, with the introduction of information technologies into products, we started to talk more about interaction design or experience design... In the past, maybe static features were more important... Now the relationship with the product has started to include more processes... of course, the content of the project topics has changed." From the student's perspective, another change observed by the instructors is that students are more comfortable expressing and objecting to their ideas about project topics. It was stated that Generation Y students wanted new technologies to be included in their project subjects. The view that the lecturers of Generation X and Y shape projects because they are more open and prone to new topics, has been frequently expressed by the Silent Generation and Baby Boomer. A participant of the Silent Generation states this situation: "If you have an unrealistic request due to the habits of the old generation, then the student is really do not want it and say there is not even an example of this, 'Why do we do it?' The new generation of faculty members are dealing with things that they know themselves more naturally". In addition, according to the instructors, the fact that characteristics such as perseverance, discipline and taking initiative became less visible in the transition from the Silent Generation to the Y Generation caused the scope of the projects to be limited sometime.

Project Description

The data revealed that Generation Y students expected clearer definitions compared to other generations. A Generation X lecturer said, "One thing is very clear, for example, I can definitely say that. If I'm giving an open-ended project, it doesn't work". A participant of the Baby Boomer said that the project descriptions were made clearer because of this attitude of the students and added "...We try to write as clearly as possible... I mean, student asks what you want in this project very clearly". It was another common view that this attitude of the Generation Y students led to a more methodological approach in defining each step related to the project. Generation X instructor expressed this situation as follows: "For example, they would give us a project, they would not define the steps of the project too much. You will decide what to do. Now design thinking etc. It seems like it started to go a little more methodically with concepts such as..." By addressing the intersection of design practice and the change of student profile, a Baby Boomer Generation participant said: "The World Design Organization also changed the definition and expanded it. It doesn't just say product, it says product, system, service, experience and defines it as a problem-solving process. Therefore, the project, which was given in education while it was object-oriented in the past, now a more contextual definition is introduced, or perhaps a technology is defined. Therefore, we tell the student where to do research and with whom to meet. For whom it was designed. In these respects, of course, the briefs have also changed."

Critique Process

Feedback in studio classes is an important pedagogical tool to encourage students' progress. A Generation X instructor stated that this process was also affected by the personal qualities of the instructor and said: "I learned everything on the project. The way the person who told me everything handled the problem, his personal charisma, the sociological, cultural and objective heritage he accumulated in his own vital world became so important..." Therefore, it has been understood that different generation characteristics manifest themselves in the critique process. According to the expressions of the participants, one of these features is that students'

expectations of approval for each step of the project during the critique phase increase. Particularly, the desire of Generation Y students to progress by getting approval at every step was frequently observed by the participants. Generation X participant said, "Our teachers would confuse us and leave. They do not tolerate confusion; they want to get results more quickly and they want approval..." Another generation X participant expressed follow as: "Criticism turn into a process of domination and approval... The student develops tactics that go against the nature of this job." In addition, it has been frequently stated that the ability of students to stand behind their ideas has gradually weakened since the Silent Generation. A Generation X participant stated this attitude of the students "Of course, we were very stubborn according to them. In other words, when the lecturer said something, there would be things we objected because 'no, I do not want to do it, or that I do not think so'... Now we cannot create that station at the student..." Another change caused by the different characteristics of the generations has been the auxiliary tools used. Instructors stated that Generation Y students tried to include technological elements in the criticism process after they started to participate in education. A Generation X lecturer said: "The main change in studio lessons may be criticizing on the computer screen, not on the paper, because in the past, people used to express their ideas by drawing, since we were not too busy with computers. Since everyone can change the model quickly and return to the previous alternatives in that change, we can see the before and after, and we experience a faster process in that way." A Generation Y instructor exemplified the involvement of technology in the process as follows: "For example, we have a portal on the internet. We critic from there. There was no such environment before..." Another issue that was mentioned by the lecturers about the criticism process was that the process was shaped depending on the subject student profile. A Generation X participant said, "For instance, the board criticism does not fit the students, so you try to make another review. In other words, I think all studios adapt themselves to the incoming student."

Design Process

The data of this study showed that the problems experienced by current students in the design process were personal, especially design thinking and abilities. It was the first opinion expressed by the instructors that they had more difficulty in managing the project process alone compared to previous generations. A Generation X participant said, "The current student has a situation like not being able to take initiative. They have less jurisdiction. Everything is given they, probably because of that...But what happens is that you cannot perceive something without touching it, so what the previous generation did is directly related to life..." In addition, it was observed that in the transition to Generation Y, it was evident that they mostly made research on the internet and wanted to reach the result with less effort, that were considered as a negative development by the academic staff. The Generation X instructor expressed this situation as follows: "20 years ago, when students were given a project, they would do research on it. They would go to the producers to do research to listen to it first-hand. The current generation has a problem like this; they take over the internet and they get what they see." Other problems expressed by the participants and thought to be increased compared to the past are the poor use of time, the long duration of the research process, distraction, and lack of intellectual infrastructure. Regarding this subject, a Generation X lecturer said, "The process of researching and finding the subject takes too long. They cannot adapt, they cannot examine the problem. It is getting much more difficult. Time is not enough..." Another Generation X lecturer stated as follows: "At the stage of the formation of the product we call "concept" in terms of intellectual depth, major bottlenecks arise in supporting the intellectual background, maturing

the process and criteria, reconciling, and drawing a sane and sustainable conclusion from this.” Another common view expressed by the lecturers was that the students tended towards projects far from reality. A lecturer from Generation X said: “The share of productivity is less. It got a little lighter. Our juries are getting lighter.”

Technology Impact

According to the responses of the lecturers, the most important reason for the change in studio lessons is technology and the relationship that new generations establish with technology. It is one of the common views that the tools and techniques that required manual skills were used in the past have lost its effects and because of the use of technological tools manual skills are affected negatively. This criticism, especially voiced by Silent Generation lecturers as follow: “For example, we did not have a computer in our environment, it is the most important one. The utility of the computer is of course very definite, but the whole issue begins with the pen I hold and, in the imagination.” And “The most creative, original part of design is not something to do with a computer. The only thing that determines the idea is your perspective, your line...Now, this event brings two kinds of beauty, such as saving time and convenience, and one great evil. You're what the computer gives, it's a pathetic situation.” The most expressed thing by the lecturers is that students' projects depend on computer facilities. It has been frequently observed by the instructors that with the digital design tools becoming dominant, students are advancing the projects they can do with these tools. A Baby Boomer participant expressed a common opinion on this subject as follows: “I definitely see that students take shelter in the easiness of giving up something that cannot be drawn in the computer program. In our time, a lot of effort would be spent. This handicraft, that is, the craft side of the work, was stronger, and those who did not do this could not be successful...” A Generation X lecturer expressed his view as follows: “The introduction of the computer created laziness and created trust to machine. It should have been a tool, it became a goal, it became a limiter...” With this approach of the students and the loss of hand drawing and other hand skills were frequently criticized by the instructors. Especially the Silent Generation and the Baby Boom Generation expressed the view that the need for students to have a drawing skill to express themselves, their designs should contain flavors that will show that are made by human hands, and technology cannot provide the qualities that the designer's infrastructure in solving problems will provide. A Baby Boom Generation instructor made the following criticism: “In the past, people were learning by doing, now they are learning by using... So, we are trying to train designers who do not have manual dexterity but leave the job to the machine with rapid prototypes and do not learn about the concepts of surface quality, behavior of materials, vein of materials. How true this is and how healthy it is evident with the results. Of course, technology is very important in design education, but it has a basis and has nothing to do with technology.” In addition, there was another common opinion expressed by the instructors that, with the start of computer programs to give satisfactory results, the need for mock-ups and models by student in the design process began to decrease. A Generation X instructor expressed the general view of instructors as follows; “While there were students who made models by hand 15 years ago, they no longer want to make models. Now they do not see this as an education and learning process.” In addition to these criticisms, it has been observed that some Generation X instructors have a more positive attitude to the use of such tools as they accelerate the processes. For example, a Generation X instructor said that; “Things like three-dimensional modeling, they brought a lot. They can see more clearly if something is going to happen.” A Baby Boomer Generation instructor expressed his opinion on this subject, contrasting his

generation, as follows: "Instead of making a mock-up with cardboard, if even the student has these tools, it doesn't bother me at all that he should do with these tools. On the contrary, I think it's good for them to try different things. If it cannot easy, maybe they will never try it, maybe the design will not develop on that side. I think all these are very useful..." In addition, it is another common view for Generation Y students who technology is a part of their lives, do not accept and make sense of any approach other than using these technologies in the design process. A Baby Boomer Generation instructor said, "The students feel that they can now do their presentation with the professionalism they see outside, and therefore they want to separate themselves from traditional technologies as much as possible. Therefore, it is not possible to say that this request of theirs is artificial."

Jury Process

The statements of the lecturers have revealed that the behaviors revealed in the juries differ according to the characteristics of the different generations of students and faculty members. Especially for Generation Y students, it was understood that respect for authority, attitudes towards criticism and their ability to express their thoughts supported this change as distinct characteristics. Accordingly, it is one of the shared common views that this generation is more closed to criticism than the other generations, that they express their opinions freely without accepting any authority, and that they question the evaluation criteria. One of the instructors of the Baby Boomer added that this situation also affected their own attitudes and said, "In the last 5-10 years, we could not to break that attitude of the students. This education is a discipline based on criticism and trial and error. However, the students are so closed to criticism...They perceive it as a personal thing, they approach all kinds of criticism very emotionally, and reactively. We have become unable to criticize the work done comfortably as we used to do. They are raised spoiled; they have high egos. So, when you criticize his work, you overthink. I wonder, how much it will hurt they, will I disincline emotionally they, what do I need to do to win they..." While talking about their student period, Generation X instructors stated that they were exposed to a harsher attitude by their professors and that the behavior of instructors in juries changed in line with the changing student profile. A Generation X also stated that the students' perspective of the jury changed, the juries became a process where students focused on the note instead of seeing their shortcomings, and that affected the communication of the academic staff with the student and said, "The perspective to the judges has changed. For example, one of my students said please do not criticize at our graduation jury the other day...Unfortunately, one of our lecturers said that 'you failed to that one of things of that model'. He/She said, 'please don't say that'. Because he/she sees it as a note tool. However, the juries are a place for discussion...Actually, the student is not aware of it, this affects the relationship of student and lecturer."

Studio Culture

The Silent Generation, Baby Boomer and Generation X lecturers have stated that studio courses not only founded the base of the education system but also created a specific culture as a social interaction environment as. They think that working with their friends and adopting that place creates a corporate belonging and affects their projects. When they compared their student periods, they indicated that there was no such case for Generation Y students, and they observed that this situation was parallel to the individual attitudes of the individual students. A Generation X instructor expressed students' attitudes as follows: "There is nothing like a studio culture in the new generation, they do not have a working together culture...They are not

tempted to work together, and they are too individual which creates a problem. Therefore, they do not like working in the studio either...I can say that we were not like that. There is a huge difference compared to 10 years ago..." On the other hand, the decrease of the concentration duration and the request of working independent of a specific environment show parallel results with the participants' opinions. A Baby Boomer lecturer provided the following example about this situation: "...I cannot carry on the working habits in the same class as I used to in the past since the concentration duration decreased. I can't go over a table and work for a long time with a pencil and a paper."

Relation Between Student and Lecturer

When the statements of the instructors are taken into consideration, it has been understood that how the instructor shares the tacit knowledge which an instructor conveys by combining his background knowledge, basic education skills and principles, with the student is very important for design education. In general, there has been a common opinion on the increased student-lecturer interaction compared to the previous generations. When Generation X instructors compared their studentship periods, they expressed that currently the attitude towards the students have been softer, while there was a tougher structure against the students in the past. Particularly for Generation X and Y, the instructors stated that they have more duty in developing the student-lecturer relations and they put more effort to understand the students compared to their studentship periods. A Generation X lecturer explained this effort as "...We are trying to talk not only as a project but also in general. So, if he/she cannot succeed in something, you are trying to understand him, for instance if there is something about the family and so on... Now we have become a little more accessible by doing so." The fact that social networks increase and differentiate student-lecturer interaction is another common opinion of most lecturers. A Generation X instructor expressed this situation with the following statements: "When I check a colleague's Facebook page, I see that more than 50 of his students follow... The flow of information, the announcement of the exam dates, the school trips etc. It has much more advantages over classical announcement pane leading to deterioration of relations. In the project development process, regardless of the working time or the lecture limit of the project, it has many benefits to support student's development when his/her effort has been seen. It is impossible to deny that there is a more socialized and fluid relationship level." In addition, depending on the conflict between the generations, there is a common idea that the old generations criticize the young generations and the young generations do not like the old generations.

Conclusion

While the oldest generation who studied in Industrial Design Departments in Turkey is the Silent Generation, existing generations consist of Generation Z who are relatively new to higher education and Generation Y. In this study, the changes in industrial design education since the studentship of the Silent Generation were examined. In-depth interviews revealed the values, attitudes, and thoughts of different generation individuals towards design education. The data obtained showed that changes arising from generational differences generally occur in the student profile, learning characteristics, education system and curriculum, studio courses and student-instructor relationship.

Generational differences in education were most evident in the students' changing characteristics and different perspectives arising from their involvement with technology. One

of the clearest conclusions reached within the scope of the study is that the generation identities of different generations of students in industrial design education are significant and distinct. According to the data obtained from the study, most of the characteristics of the generations are in line with the literature, whereas the Generation Y is described as individuals who accept authority and obey the rules in the literature contrary to the obtained data (Howe & Strauss, 2000; Gursoy et al., 2008). On the other hand, Generation X and Baby Boomers, who are stated to question the authority in the literature, have been described as individuals submissive to authority in this study. However, in education, it has been observed that different attitudes about respect to authority are discussed in terms of the students' acceptance or questioning levels of traditional views and orders. In addition, it was revealed that Generation Y students were not prone to group work, unlike the literature, depending on their individual attitudes. The changing characteristics of the students resulted in both the differentiation of educational approaches and the adaptation of communication with students accordingly. It can be said that a more student-centered and more declared process included educational approach has begun to be adopted by Generation Z students.

Within the scope of the study, it has been revealed that the biggest factor that makes a difference between individuals from different generations is technology and the involvements of generations in technology. In parallel with the literature, it was found that the involvements of the Generation Y and Generation X students in technology was more intense and better than the Silent Generation and Baby Boomers. Considering the effect of technology, it has been observed that with the inclusion of technology in the process in accordance with the generation literature, the concentration time of the students in the transition to the Generation Y has been shortened and the multitasking habits have increased, and it has been revealed that the close relationship of Generation Y with technology is effective in this case. It has been revealed that technology also changes the tools used by students and learning environments of them and thus students prefer an independent learning style. In compliance with the generational literature, the desire of Generation Y students to include technology in every stage of education has been criticized by the Silent Generation who are relatively distant from technology and approach cautiously. The X Generation instructors, who are better with technology, approached more positively. Baby Boomers, who have a more indifferent and harsher attitude towards technology, do not take a conservative attitude towards the use of technology by the students as long as it is used correctly. That fact shows that the obtained data conflicts with generation theories.

It has been observed that this process tried to be made more methodological when the approaches of the Silent Generation instructors who rely on the standardized procedures and templates with their commitment to the control-command leadership (Martin & Tulgan, 2006) and Baby Boomer instructors who respect authority and hierarchy (Gursoy et al., 2008), combined with the characteristics of the Y Generation students. It has been observed frequently that Generation Y students avoid taking initiative, want to move forward with approval, their ability to stand behind their ideas has weakened, and they are result-oriented compared to previous generations. In line with the literature, the reason of that fact is, helicopter parents making decisions for them and planning their lives. Besides, these attitudes of new generation, who want immediate results-oriented feedback and approval, have also been parallel to the generation literature. Interaction and communication emerged as another

problem especially in the decision-making process and the study revealed that students rely on instructors and the internet to solve learning problems.

Considering the characteristics of Generation Y which make up the majority of the last generation of students and Generation Z, which make up the majority of the current generation of students, the inclusion of the latest technologies, which have an important role for these generations, will strengthen the sense of responsibility of students, improve their decision-making skills and improve their creativity in wider areas. It can be said that it would be appropriate to carry out the activities that they can use. In addition, it is considered important to provide clear definitions of projects and processes and to make clear expectations. It is claimed that the use of visual elements in education is more beneficial due to the cognitive development of Generation Z (Rothman, 2014). In addition, it is argued that students should be given the opportunity to use the skills they are aware of and that motivates students to do so (Prensky, 2014). The development of support for communication and interaction with students, the provision of frequent and immediate feedback, the use of online course materials, the incorporation of learning materials with more visual elements into the process, the presentation of projects that interest them and can relate to real life, and the creation of an understanding of research-based education for Generation Z students are required education strategies. Hence it is important to create an open educational structure that can support a dynamic approach in both the design practice and the student profile and adapt to rapidly changing content. To ensure that education is appropriate and effective, the ability of control to students learning processes should be supported by a student-centered learning environment.

This study was carried out within the scope of industrial design departments in Turkey. Therefore, even if the concept of global generation is mentioned today, the study should be evaluated in the context of Turkey's local conditions. Industrial Design Departments of Turkey due to the great majority of the human resources Generation X, and mainly consisting of the participants of Generation X lecturers, are limitation in this work. In addition, since most of the last generation of students are Generation Y, the views of educators focused on Generation Y. In addition, it should be stated that the results obtained in the study are limited to the views of the academic staff participating in the study and that the differences arising from the educational approaches of different universities are excluded from the scope of the study. On the other hand, another limitation of the study is that it is based on cross-sectional data, due to the uncertainty of the differences between generational characteristics and individuals' age-related characteristics. It would be appropriate for future research to consider the characteristics of the participants longitudinally.

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