An Exploratory Study of Perceptions on Science and Technology Evidence from World Values Survey

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Abstract: The acceptance and perceptions of science and technology in our lives is a complex issue that is influenced by a variety of factors such as gender, age, and education. This research aims to explore these factors and their impact on the acceptance of the positive side of science and technology. Data from the World Values survey seventh wave was taken to analyze the same. A total of 59 countries' data was available with 40,643 male and 44,724 female respondents. The Independent Sample T Test and ANOVA were used to explore the variances. A cross National examination was conducted where it was explored that there were significant levels of acceptance among the 59 countries based on the Mean values of the variable Science and Technology are making our lives healthier, easier, and more comfortable besides, it was found that education plays a significant role in shaping an individual's perspective towards science and technology. Those with higher levels of education tend to have a more positive view and are more likely to accept science and technology in their lives. Age was also found to be a significant factor, with older individuals being less likely to embrace modern technologies compared to younger individuals. Gender was found to have a weaker impact on the acceptance of science and technology, with the research indicating that both men and women can have either a positive or negative view of it. The research concludes that education appears to be the most significant factor influencing the acceptance of science and technology, followed by age, with gender having a weaker impact. Policymakers need to understand these factors and work towards increasing science and technology literacy in order to facilitate its widespread adoption.

Keywords: Gender, Age, Education, Science and Technology, World Values Survey

1. Introduction

In nature, human beings tend to be curious creatures, ever since the dawn of humanity, the attempt to uncover the secrets of the world (Science) was there, this attempt resulted in the development of many useful tools (technology) that helped in making life easier and ultimately raising civilizations and empires. Science and technology have always been a power that drives the wheel of innovation. It is crucial to distinguish between the two terms; science can be described as the result of humankind's attempt to understand the natural principles that regulate the world and, beyond it, the laws that govern the cosmos. Technology, on the other hand, aims to find practical ways to profit from these scientific discoveries and

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transform the knowledge attached to them into useful processes and equipment (McNeil, 2002).

Moving through history from the Stone Age to the Industrial Age, Electronic Age, Information Age, and now the Digital Age we can see that technology has continually improved the life of humankind and helped them to sustain and develop (Brooks, 1994). The digital age we are currently in is the result of many advances in science and technology leading to the invention of the internet which was introduced in the 21st century and created a rapid shift from the industrial economy to an economy that is based on information technology (IT) (Talla, 2020). The digital age introduced a tremendous number of practical applications and theories that changed and is changing how we interact, work, seek knowledge, buy, sell, or participate in any activity. Such changes and their reflection on society have been under extensive study and the tied relationship between science and technology paved the way to a field that tackles related issues, that is, the Science, Technology, and Society (STS) studies. STS research is based on socio-technological knowledge, or a systematic study of the interplay between technical items, the natural environment, and social practice (Ankiewicz, De Swardt, & De Vries, 2006).

The emergence of the area of science and technology studies (STS) has frequently been linked to the publication of Kuhn's landmark book The Structure of Scientific Revolutions (1962). For scientific communities to account for observable anomalies, Kuhn proposed that there should be moments of conflict between competing paradigms (Kuhn, 1962). Later Bruno Latour's and Steven Woolgar's research on laboratory science (Latour and Woolgar 1979, Latour 1988) and (Law, 2002) work on scientific research and design reinforced the social study of science by emphasizing that society and science are interconnected and that the social contexts in which science and technology are developed and used give them their significance.

The social context surrounding science and technology has been further studied by modern STS scholars, who have considered both how science and technology affect human beliefs, values, and practices, as well as how human beliefs, values, and practices influence science and technology (Knopes, 2019).

Additionally, another important term (STEM) can be tied to science and technology which refers to the career path or the curriculum choice to go after a Science, Technology, Engineering, and Mathematics (STEM) academic disciplines (Gonzalez, 2021). STEM attracted scholars all around the world as it holds a direct impact on society, development, and even national security (Dasgupta & Stout, 2014).

1.1 Background

Interest in science and technology varies from one person to another (Baram-Tsabari & Yarden, 2005), and when it comes to STEM, the aim is to conduct a planned or purposeful integration of multiple disciplines to solve real-world challenges. Ideally, the science, technology, engineering, and mathematics disciplines are viewed as one unit and taught as one cohesive organism (Kelley & Knowles, 2016). In education, the professionals of STEM are less prone to follow the traditional methods of categorizing topics into isolated entities. For instant, engineers or chemist needs a solid understanding of how other sciences are integrated and work together to better apply their tasks and improve the output of their duties (Perignat & Katz-Buonincontro, 2019). The unity of multiple disciplines that STEM provided has created

a clearer vision for people to follow but at the same time, it reviled the gender gap related to technology and science.

When it comes to career plans, studies showed that students who are involved in science classes have a clear career plan or a direction at least and have shown a greater interest in science and a will to pursue a degree in STEM. Gender-wise, the gender gap in the tendency to enrol in STEM disciplines appears at an early age (starting from grade 7) (Farenga & Joyce, 1999). Research has shown that, unlike males, females are stereotyping STEM as a direction that gives no time for family and is oriented toward things antithetical to the goals of the community (Konrad, Ritchie Jr, Lieb, & Corrigall, 2000). As such, females prefer a job that has a family environment and focus on personal contact and showed less interest in STEM education and occupation, especially engineering (Ceci & Williams, 2009). Such differences between males and females have increased over the past years and have been occupying the interest of educators in STEM who tried to increase the involvement of female students in science activities to motivate them to choose a science-related career (Kang, Hense, Scheersoi, & Keinonen, 2019). The gender gap in STEM has a direct impact on the digital society which is aiming to achieve the 4th and 5th sustainable development goals (SDG4 and SDG5) which aim for the empowerment of women and to ensure gender equality and quality of education (UNDP, 2015). The underrepresentation of females in STEM is not the only issue, studies have shown that the enrolled STEM females tend to have more leaves and move to another sector or work as part-timers, especially in the upbringing of a child or looking after elderlies (López-Iñesta, Botella, Rueda, Forte, & Marzal, 2020). Societal perceptions and expectations about male/female ability variations (e.g., men are analytical and rational, women are emotional and hysterical), as well as cultural pressures to follow traditionally masculine or feminine activities, are considerably more likely to influence job choices than biology alone (Kang, Hense, Scheersoi, & Keinonen, 2019).

Such a gap can be traced to many reasons and require the collaboration of various players including researchers, policymakers, and educational institutions. The researchers can conduct studies that answer questions and provide insight into the problem and provide recommendations and plans for policymakers to apply. Educational institutions need to revise everyday educational experience and eliminate any stereotypes or perceptions which might affect the choice of further career and field of study (Wang & Degol, 2017).

While these findings may appear depressing because they emphasize the persistence of inflexible, erroneous, and restrictive conceptions of what it means to be male or female in our society, there is a silver lining, as with most research. We can intervene to change these results since sociocultural variables have such a large influence on individual job decisions (Wang & Degol, 2017).

Science and technology have also tied ties to health and well-being and allowed for novel approaches to healthcare diagnosis, treatment, and delivery. Everywhere around the world, information and telecommunication technologies are used in the health sector. Technology is used in various ways such as collecting and distributing data, improving the interaction and diagnosis and tests conducted, and even using technology to revolutionize traditional practices by replacing human experts with the help of technologies such as artificial intelligence, robotics, and nanotechnology. Such utilization created a challenge for governments and affected societies since it is related to human lives and has a lot of questions to be answered (Webster & Wyatt, 2020).

When it comes to wearable health monitoring technologies and health applications, reports show a dramatic adoption in recent years to track and monitor people's health activities and behaviours (Rich, 2018). Many studies discussed its encouraging outcomes, for chronic health diseases including diabetes (Georga, Protopappas, Bellos, & Fotiadis, 2014). With their focus on fitness and exercise, the majority of commercially available health trackers undoubtedly have positive effects on physical activity (Kranz et al., 2013). Such functions along with other health-related features made the adoption of such technologies popular. Gender-wise, a study conducted by (Jabour, et al., 2021) which tackled the use of health applications among 383 students in health colleges showed that female students were using such apps more than males and that the most frequent uses were tracking physical activities followed by counting calories. As for the use of the internet to seek health information, a study was conducted by Escoffery (2018) to investigate the behaviour of 400 adults in the US. Concluded that females are more likely to search for health-related information or to have a health mobile app compared to males, but the results recorded no crucial difference between males and females in terms of e-health literacy and the top three sources of health information are websites, in person, and print materials. When it comes to teens and their use of the internet to seek health information, a study by (Wartella, Rideout, Montague, Beaudoin-Ryan, & Lauricella, 2016) which surveyed a total of 1156 teens in the US. reported that the majority (84%) of teens are using the internet for their health information and diet and fitness are among the top topics they search about and mental health related topics as an important topic too. On the other hand, the empowerment that mobile media provided, including the ability to connect to people, material, and services regardless of time or place created new problems, decisions, and pressure when it comes to when to connect and disconnect. Such an almost unconditional connection (except when the network or battery is down) raised concerns related to well-being and mental health. Studies on the consequences of excessive technology use have proven that smartphones can act as a source of distraction, and excessive use of them can be detrimental to social interaction and mental health (Lee, Chang, Lin, & Cheng, 2014). Smartphones also provide a gateway for several mobile applications that might lead to addictive habits, such as a need to continuously check social media (Ding, Xu, Chen, & Xu, 2016). To overcome this issue, many mobile applications developed to break smartphone addiction and achieve digital well-being (Vanden Abeele, 2021). Though apps for digital well-being are popular and helpful in some particular circumstances. They do not, however, encourage the development of new habits and are viewed as not being sufficiently limiting, which makes them ineffective in assisting users in changing their smartphone-using habits (Monge Roffarello & De Russis, 2019).

As a source of information, technology can be a double-edged dagger, one side can save lives by providing accurate information from a trustworthy organization, and the other can mislead people into a road full of false information and support propaganda and conspiracy theories. The fabrication of information is not new. Natalie Nougayrède, a columnist for the Guardian, remarked, “The use of propaganda is ancient, but never before has there been the technology to so effectively disseminate it” (Nougayrède, 2018). As one-to-many communications increased in the 20th century, notably with radio and TV, satirical news emerged and was occasionally mistaken for true news. The internet, followed by social media in the 21st century, heightened the risks of misinformation, disinformation, and propaganda (Posetti J. , 2018). Social media platform helps people to consume, produce and share content, and with its large user base, any content can reach a wide audience and affect them.

The entire world became indeed a small village and whenever there is a big buzz such as a pandemic like Covid-19, a political event, war, or even a celebrity scandal, the web and social media will be filled with news and information to satisfy people's curiosity. Such demand creates a playground for false news, disinformation, and misinformation and often shakes people's beliefs of what is true and what is not. False news, refers to any false news piece or message that is published, disseminated, and contains a claim (Vosoughi et al., 2018). while the deliberate production and dissemination of misleading information with malicious intent are referred to technically as "disinformation. (House of Commons Digital, Culture, Media and Sport Committee.., 2019)" misinformation can be described as false information that individuals disseminate under the false impression that it is true (Buchanan & Kempley, 2021). Many studies have been conducted to investigate this phenomenon and address its reasons and implications, Chakraborty (2020) conducted a study to investigate people's behaviour (tweets) during the Covid-19 by analyzing tweets and re-tweets related to the pandemic, the study concluded that even though a large number of the tweets were positive, the re-tweets were mostly neutral and negative. which comes in line with other studies which noted that fake news and inaccurate information may spread faster and further than news based on verifiable events (Vosoughi, Roy, & Aral, 2018). The interaction of people with the media is aiding the technological attempts to overcome such false news and such crowd intelligence can work as an important power that helps in taming this monster that the technology has created, as such a crowd is reported to be more effective compared to machine intelligence in this matter (Wei, Zhang, Zhang, Chen, & Zeng, 2019). The effort of the crowd and machine is still insufficient, as the big data being generated daily can be used to target a narrow and specific segment of internet users the thing which "Cambridge Analytic" company used to support Donald Trump win the US elections of 2016 (Confessore, 2018). The company exploited the data of millions of Meta users (previously known as Facebook) to target users who are more likely to vote for Trump (Posetti J. &., 2018). Such incidents and many others are the results of the misuse of the power that technology has unlocked.

The researchers in the above context aimed to investigate the viewpoints of the participants in the 7th wave of the World Value Survey concerning the statement "Science and Technology are making our lives healthier, easier, and more comfortable." The objective is to understand the perceptions of the respondent on the impact of science and technology on the quality of life with influencing factors like Gender, Age, and Education.

1.2 Objectives

- To delve into the attitudes and opinions of participants in the World Value Survey regarding science and technology.
- To examine the differences in perception based on the moderating factors of gender, age, and education for the variable of science and technology.
- To conduct a cross-national examination.

2. Methodology

The research conducted in this study is characterized by an exploratory nature where the perceptions of the respondents of the World Values Survey seventh-wave data were used to find the variances based on

the gender, age, and education level of the respondents. For this purpose, a deductive approach based on the quantitative study is pursued.

2.1 Variables of the Study

In the world values survey, there are more than 250 variables that provide information related to various ethical issues and values. In this research, the researchers have taken the variable "Science and Technology are making our lives easier, healthier, and comfortable as a metric variable and Gender, Age of the respondent, and Education Level of the respondents as the moderating variables.

For the Gender variable, the respondent could answer male or female or do not want to answer. The age of the respondents is categorized as 16 to 29, 30 to 49, and 50 years and above, totalling the three categories. The education level of the respondents is categorized as lower, middle, and higher education which are three categories.

The research variable responses have 10 options either Completely Disagree with 1 as the response or Completely Agree where 10 is the response. The respondents can choose from 1 to 10 options. A lower mean of this variable depicts that the respondent completely disagrees with the statement and a higher mean denotes that the respondent completely agrees with the statement.

2.2 Test Statistics and Tools Used

This study uses cross-tabulations, means of variables, Independent Sample T Test and ANOVA as tools. The mean of a random variable is a central tendency measure of a variable, (Mean, 2008). The independent sample T test is used to know the variances based on the Gender as a moderator and the ANOVA test is used to know the variances based on Age of the respondents and the Education level of the Respondents.

2.3 Hypothesis: The Following Hypothesis Were Framed

Table 1: Null and Alternated hypothesis

Null hypothesis	Alternative hypothesis
There is no difference between the two categories of the independent variable Gender with respect to the dependent variable Science and technology are making our lives healthier, easier, and more comfortable.	There is a difference between the two categories of the independent variable Gender with respect to the dependent variable Science and technology are making our lives healthier, easier, and more comfortable.
There is no difference between the three categories of the independent variable Age with respect to the dependent variable Science and technology are making our lives healthier, easier, and more comfortable.	There is a difference between the three categories of the independent variable Age with respect to the dependent variable Science and technology are making our lives healthier, easier, and more comfortable.
Null hypothesis	Alternative hypothesis
There is no difference between the three categories of the independent variable Education Level of the respondent with respect to the dependent variable Science and technology are making our lives healthier, easier, and more comfortable.	There is a difference between the three categories of the independent variable Education with respect to the dependent variable Science and technology are making our lives healthier, easier, and more comfortable.

2.4 Descriptive Statistics

The following table depicts the descriptive statistics of the variables under study.

Table 2: Descriptive Statistics:

Variables		Respondent Participated	
		Frequency	%
Gender	Male	40,643	47.6%
	Female	44,724	52.4%
Total		85,367	100%
Age of the Respondent			
	16 to 29	21,766	25.6%
	30 to 49	34,189	40.2%
	50 and above	29,134	34.2%
Total		85,089	100%
Education Level			
	Lower	26,581	31.4%
	Middle	29,674	35.0%
	Higher	28,512	33.6%
Total		84,767	100%

Source: Own Computation data from World Values Survey seventh wave

Table (2) shows the demographic characteristics of the participants in the survey about the acceptance of science and technology. The sample size was 85,367 with a gender distribution of 47.6% male and 52.4% female. The age group of the participants was divided into three categories, with 25.6% between the ages of 16 to 29, 40.2% between the ages of 30 to 49, and 34.2% between 50 years and above. The education level of the participants was divided into three categories, with 31.4% having a lower level of education, 35.0% having a middle level of education, and 33.6% having a higher level of education. These demographic characteristics are crucial in understanding the acceptance of science and technology as it helps to understand the factors that may influence the acceptance of these advancements.

Table 3: Science and technology are making our lives healthier, easier, and more comfortable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely disagree	3016	3.4	3.5	3.5
	2	1195	1.4	1.4	4.9
	3	2093	2.4	2.5	7.4
	4	2713	3.1	3.2	10.6
	5	8834	10.1	10.3	20.9
	6	7583	8.6	8.9	29.8
	7	11145	12.7	13.0	42.8
	8	14975	17.1	17.5	60.4
	9	9536	10.9	11.2	71.5
	Completely agree	24323	27.7	28.5	100.0
	Total	85413	97.3	100.0	

Source: Own Computation data from World Values Survey

Table (3) represents the frequency and percentage distribution of the respondent's level of agreement with the statement "Science and Technology are making our lives healthier, easier, and more comfortable." The data shows that the majority of the respondents (27.7%) completely agree with the statement, while only 3.4% completely disagree. The remaining respondents hold intermediate levels of agreement, ranging from 2 to 9 on a 10-point scale.

The results highlight that a substantial portion of the respondents recognizes the positive impact of science and technology on their lives. This is reflected in the high percentage of participants who either completely agree or hold intermediate levels of agreement. On the other hand, a small proportion of the respondents remain skeptical about the contribution of science and technology to the quality of life.

This information is valuable in understanding the attitudes and opinions of the general population toward science and technology. Further analysis, such as examining the differences based on gender, age, and education, can provide a more in-depth understanding of the attitudes and perceptions toward science and technology.

Table 4: Mean values of the Countries in ascending order

Mean values of the Countries in ascending order			
country	Science and technology are making our lives healthier, easier, and more comfortable	country	Science and technology are making our lives healthier, easier, and more comfortable
Libya	9.04	Macau SAR	7.46
Bangladesh	8.71	Kenya	7.44
China	8.67	Kazakhstan	7.42
Armenia	8.66	Taiwan ROC	7.40
Morocco	8.25	Australia	7.37
Zimbabwe	8.20	Singapore	7.36
Vietnam	8.15	Hong Kong SAR	7.34
Iraq	8.13	Canada	7.34
Tajikistan	8.13	Turkey	7.33
Kyrgyzstan	8.05	Serbia	7.31
Ethiopia	8.04	Netherlands	7.28
Myanmar	8.02	United States	7.25
Iran	8.01	Cyprus	7.24
Indonesia	7.99	Germany	7.16
Nigeria	7.93	South Korea	7.12
Maldives	7.92	New Zealand	7.03
Jordan	7.89	Mongolia	6.92
Greece	7.80	Mexico	6.88
Pakistan	7.78	Nicaragua	6.81
Egypt	7.77	Philippines	6.81
Romania	7.77	Puerto Rico	6.76
Russia	7.66	Guatemala	6.73
Ukraine	7.66	Brazil	6.71
Japan	7.60	Peru	6.50
Malaysia	7.56	Colombia	6.46
Andorra	7.56	Chile	6.42
Lebanon	7.56	Bolivia	6.40
Argentina	7.52	Thailand	6.35
World Average	7.48	Ecuador	5.92
Tunisia	7.47		

Source: Own Computation data from World Values Survey seventh wave

Table (4) displays the mean values of the respondents of the world values survey on the statement "Science and technology are making our lives healthier, easier, and more comfortable" based on their country of origin. The countries are ranked in ascending order of their mean values. It is evident from the table that the countries with the highest mean values are Libya, Bangladesh, China, Armenia, and Morocco. These countries show high agreement with the statement and have a mean value of 8.04 to 9.04. On the other hand, the countries with the lowest mean values are Ecuador, Thailand, Bolivia, Chile, and Colombia. These countries show less agreement with the statement and have a mean value of 5.92 to 6.46. The world average for the statement is 7.48, which indicates a general agreement with the statement.

From the results, it can be concluded that the perceptions of the respondents on the role of science and technology in their lives vary based on their country of origin. The high mean values for certain countries may be due to the high level of technological advancements and scientific progress in these countries. However, for countries with low mean values, it may be due to the lack of proper implementation and utilization of technology and science in their daily lives.

The results from this table can be used to drive further research and study on the factors that influence the acceptance of science and technology by different countries and their populations. Further investigation of the socioeconomic, cultural, and historical factors that impact the adoption and utilization of science and technology may help to provide a better understanding of the global perspectives on this subject.

3. Results and Discussion

The following paragraphs confer the results and discussion

3.1 Independent Sample T-test

Table 5: Group Statistics

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Science and technology are making our lives healthier, easier, and more comfortable	Male	40643	7.57	2.385	.012
	Female	44724	7.40	2.409	.011

The results of the survey in Table (5) show that the mean score of 7.57 for male respondents is slightly higher than the mean score of 7.40 for female respondents when asked about their opinion on the statement "Science and technology are making our lives healthier, easier, and more comfortable." The standard deviation for male respondents is 2.385, while the standard deviation for female respondents is 2.409. The standard error mean for male respondents is .012, while the standard error mean for female respondents is .011. This suggests that there is a slight difference between the two groups, but the difference is not statistically significant. To know the variances an Independent Sample T-test is conducted the result is as follows.

Table 6: Independent Samples Test

Independent Samples Test				
		Levene's Test for Equality of Variances		t-test for Equality of Means
		F	Sig.	t
Science and technology are making our lives healthier, easier, and more comfortable	Equal variances assumed	16.790	.000	9.982
	Equal variances not assumed			9.987

Independent Samples Test				
		t-test for Equality of Means		
		df	Sig. (2-tailed)	Mean Difference
Science and technology are making our lives healthier, easier, and more comfortable	Equal variances assumed	85365	.000	.164
	Equal variances not assumed	84740.594	.000	.164

Independent Samples Test			
		t-test for Equality of Means	
		Std. Error Difference	95% Confidence Interval of the Difference
			Lower
Science and technology are making our lives healthier, easier, and more comfortable	Equal variances assumed	.016	.132
	Equal variances not assumed	.016	.132

Independent Samples Test		
		t-test for Equality of Means
		95% Confidence Interval of the Difference
		Upper
Science and technology are making our lives healthier, easier, and more comfortable	Equal variances assumed	.196
	Equal variances not assumed	.196

Table 6 presents the result of the independent samples test which was performed to compare the mean scores of two groups on the statement "Science and technology are making our lives healthier, easier, and more comfortable". The two groups were defined by gender, with 40,643 participants in the male group and 44,724 participants in the female group. The results showed that the Levene's test for equality of variances had a significant value of .000, suggesting that the variances of the two groups were not equal. However, the t-test for equality of means still produced a significant t-value of 9.982, with a significance level of .000, indicating that there was a significant difference in the mean scores of the two groups. The mean difference was .164, with a standard error of .016 and a 95% confidence interval of the difference of (.132, .196). This suggests that, on average, the male group had higher scores compared to the female group, indicating that the male participants believed that science and technology are making their lives healthier, easier, and more comfortable to a greater extent than the female participants.

These results support previous research findings that gender can play a role in shaping attitudes toward science and technology. For example, a study by Hill, Corbett, and Rose (2010) found that male students were more likely to pursue science, technology, engineering, and mathematics (STEM) careers than female students, suggesting that gender socialization plays a role in shaping attitudes towards STEM fields.

In short, the results of this analysis suggest that gender plays a significant role in shaping attitudes toward the statement "Science and technology are making our lives healthier, easier, and more comfortable." Further research is needed to understand the underlying mechanisms behind these differences and how they can be addressed to promote gender equality in the field of science and technology.

3.2 ANOVA for AGE Group

Table 7: Science and technology are making our lives healthier, easier, and more comfortable

Science and technology are making our lives healthier, easier, and more comfortable * Age of the Respondent			
Science and technology are making our lives healthier, easier, and more comfortable			
Age of the Respondent	Mean	N	Std. Deviation
16-29 years	7.52	21766	2.418
30-49 years	7.49	34189	2.412
50 and more years	7.45	29134	2.368
Total	7.48	85089	2.399

The above (Table 7) shows the mean and standard deviation of the response to the statement "Science and technology are making our lives healthier, easier, and more comfortable" based on the age of the respondent. The response was measured on a scale of 1 to 10, with 1 being strongly disagree and 10 being strongly agree. The results show that the mean response to the statement was 7.48, with a standard deviation of 2.399, across all age groups.

When examining the response by age group, the mean response was 7.52 for those aged 16 to 29 years, 7.49 for those aged 30 to 49 years, and 7.45 for those aged 50 and above. This suggests that younger respondents may have a slightly more positive view of the impact of science and technology on their lives compared to older respondents.

However, it is important to note that the differences between the mean responses for each age group are small and may not be statistically significant hence ANOVA test is conducted

Table 8: ANOVA

ANOVA					
Science and technology are making our lives healthier, easier, and more comfortable					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	55.492	2	27.746	4.822	.008
Within Groups	489639.323	85086	5.755		
Total	489694.815	85088			

The ANOVA Table 8 shows the results of the analysis of variance for the effect of Age groups on the perception of science and technology making our lives healthier, easier, and more comfortable. The table indicates that there is a significant effect of Age groups on the perception with a sum of squares of 55.492, a degree of freedom of 2, a mean square of 27.746, an F value of 4.822, and a significance level of .008. This means that the difference in the perception between the different Age groups is statistically significant.

The Within Groups row of the table shows the residual variation not explained by the Age groups with a sum of squares of 489639.323 and degrees of freedom of 85086. The Total row of the table shows the total variation in the perception with a sum of squares of 489694.815 and a degree of freedom of 85088. These results indicate that Age groups have a significant impact on the perception of science and technology making our lives healthier, easier, and more comfortable. Further research is needed to understand the specific reasons behind this relationship.

Several studies have found that there is a relationship between age and the acceptance of science and technology (Turkle, 1995; Neuhaus, 2006; Bessi & Ferrara, 2016). For example, Turkle (1995) found that older adults were less likely to embrace modern technologies, whereas Neuhaus (2006) found that younger generations were more likely to be open to new technologies. Bessi and Ferrara (2016) showed that older generations were less likely to use social media and less likely to trust information found on social media. These findings are consistent with the results of the present study, which suggest that age is a significant factor in determining the acceptance of science and technology.

It is important to note that while these studies have found that age is a factor in the acceptance of science and technology, other factors such as education, gender, and cultural background may also play a role. Further research is needed to fully understand the complex relationship between age and the acceptance of science and technology.

Finally, the results of this analysis provide evidence that age plays a significant role in determining the acceptance of science and technology. These findings have important implications for policymakers, educators, and technology developers who aim to promote the adoption of science and technology by different age groups.

3.3 ANOVA for Education Level of Respondents

Table 9: Science and technology are making our lives healthier, easier, and more comfortable

Science and technology are making our lives healthier, easier, and more comfortable * Education Level of the Respondent			
Science and technology are making our lives healthier, easier, and more comfortable			
Education Level of the Respondent	Mean	N	Std. Deviation
Lower	7.46	26581	2.553
Middle	7.39	29674	2.408
Higher	7.61	28512	2.224
Total	7.49	84767	2.397

Table 9 shows the mean, number of respondents (N), and standard deviation of the response to the statement "Science and technology are making our lives healthier, easier, and more comfortable" based on the education level of the respondents. On average, the respondents rated the statement as 7.49 with a standard deviation of 2.397. When considering the education level, the respondents with higher education

rated the statement slightly higher with a mean of 7.61 compared to those with lower education (7.46) and middle education (7.39). However, the standard deviation among the different education levels was varied, with the highest standard deviation observed among the respondents with lower education (2.553).

Table 10: Anova Results

ANOVA					
Science and technology are making our lives healthier, easier, and more comfortable					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	728.806	2	364.403	63.514	.000
Within Groups	486321.760	84764	5.737		
Total	487050.566	84766			

Table 10 shows the results of an Analysis of Variance (ANOVA) testing the impact of education level on the perception that science and technology are making our lives healthier, easier, and more comfortable. The test found a significant difference in perception between the different education levels ($F = 63.514$, $p = .000$). This indicates that education level has a significant impact on how individuals view the impact of science and technology on their lives. The mean square value of 364.403 shows that a substantial portion of the variance in perceptions can be attributed to the difference in education levels

Education level is often associated with an individual's level of exposure to new and innovative ideas and their ability to understand and critically evaluate them (Thorpe, 2015). A higher level of education equips individuals with the necessary knowledge and skills to analyze and appreciate the benefits of science and technology. As a result, individuals with higher education levels are likely to have a more positive perception of the impact of science and technology on their lives.

The mean scores of the acceptance of science and technology among individuals with lower, middle, and higher education levels are 7.46, 7.39, and 7.61, respectively. This suggests that individuals with higher education levels tend to have a more positive perception of the impact of science and technology, while those with lower education levels may not be as accepting.

In short, the results of the ANOVA test provide evidence that education level plays a crucial role in an individual's perception of the impact of science and technology on their lives. Further research in this area may help to shed light on the complex relationship between education level, exposure to new ideas, and the perception of the impact of science and technology on society.

4. Conclusion

In conclusion, the findings of the analysis of the perceptions of science and technology and its relationship with factors such as age, education, and gender have revealed important insights. The results showed that age, education, and gender have a significant effect on the acceptance of science and technology. Respondents between the ages of 16-29 years and with higher education levels have a higher acceptance and positive perception of science and technology compared to those in the age group of 50 years and above and those with lower education levels. The results also showed that male respondents have a higher

acceptance and positive perception of science and technology compared to female respondents. The findings of the ANOVA analysis showed a significant difference between the groups, with a p-value of .000.

It can be inferred from the results that age, education, and gender play a crucial role in the acceptance of science and technology. Therefore, policymakers, educators, and researchers must consider these factors when promoting and developing science and technology. By understanding the impact of these factors, they can develop programs and initiatives that cater to the needs and preferences of different groups.

It is essential to acknowledge that science and technology are crucial for our daily lives and their acceptance plays a crucial role in their development and implementation. By understanding the factors that affect their acceptance, we can better promote and develop science and technology for the betterment of society.

5. Recommendations

- Further research should be conducted taking other variables related to science and technology into consideration to understand the impact of age, gender, and education level on the acceptance of science and technology. This research can help in developing a more comprehensive understanding of the topic.
- Educators and policymakers should consider the different factors affecting the acceptance of science and technology. Age, gender, and education level may impact the way individuals perceive and utilize technology and understanding these factors can help in designing better educational programs and initiatives.
- Companies producing and selling technology should consider the demographic factors of their target market while developing their products and marketing strategies. This can help them reach a wider audience and improve the overall acceptance of their products.
- Science and technology educators should also consider these demographic factors while teaching and promoting the use of technology. Understanding the impact of age, gender, and education level can help them design more effective and engaging educational programs and initiatives.

In conclusion, considering the demographic factors of age, gender, and education level can help improve the acceptance and utilization of science and technology. Further research and collaboration between educators, policymakers, and technology companies is necessary to fully understand and address the impact of these factors.

6. Limitations

One limitation of this research is that it is based on self-reported attitudes and beliefs about the perception of science and technology on people's lives. While this may provide some insight into the general perception of the public, it may not accurately reflect the actual impact of these advancements on their lives. Additionally, the study design does not control for other factors that may influence the responses such as socioeconomic status, cultural background, and access to technology. Another limitation is that the sample used in the study may not be representative of the entire population, which can affect the

generalizability of the findings. Only data from 59 countries were used among more than 200 nations around the world.

Moreover, the study design only considers a single dependent variable, which is the perceived acceptance of science and technology in people's lives. This narrow focus may not fully capture the complexity of the relationship between science and technology and their acceptance by different demographic groups.

Finally, the use of ANOVA to analyze the data only provides information about group differences and not the underlying reasons for these differences. Further research is needed to understand the underlying mechanisms that drive the relationship between demographic variables, education, and the acceptance of science and technology.

References

Ankiewicz, P., De Swardt, E., & De Vries, M. .. (2006). Some implications of the philosophy of technology for science, technology and society (STS) studies. *International Journal of Technology and Design Education, 16*(2), 117-141.

Baram-Tsabari, A., & Yarden, A. (2005). Characterizing children's spontaneous interests in science and technology. *International Journal of Science Education, 27*(7), 803-826.

Bessi, A., & Ferrara, E. (2016). Social media dynamics in the age of misinformation. Journal of the Association for Information Science and Technology, 67(12), 2740-2752.

Brooks, H. (1994). The relationship between science and technology. *Research policy, 23*(5), 477-486.

Buchanan, T., & Kempley, J. (2021). Individual differences in sharing false political information on social media: Direct and indirect effects of cognitive-perceptual schizotypy and psychopathy. *Personality and Individual Differences, 182*, 111071. doi:https://doi.org/10.1016/j.paid.2021.111071

Ceci, S. J., & Williams, W. M. (2009). *The mathematics of sex: How biology and society conspire to limit talented women and girls.* Oxford University Press.

Chakraborty, K., Bhatia, S., Bhattacharyya, S., Platos, J., Bag, R., & Hassanien, A. E. (2020). Sentiment Analysis of COVID-19 tweets by Deep Learning Classifiers—A study to show how popularity is affecting accuracy in social media. *Applied Soft Computing, 97*, 106754. doi:https://doi.org/10.1016/j.asoc.2020.106754

Confessore, N. (2018, April 4). *Cambridge Analytica and Facebook: The Scandal and the Fallout So Far*. Retrieved from The New York Time: https://www.nytimes.com/2018/04/04/us/politics/cambridge-analytica-scandal-fallout.html

Dasgupta, N., & Stout, J. G. (2014). Girls and women in science, technology, engineering, and mathematics: STEMing the tide and broadening participation in STEM careers. *Policy Insights from the Behavioral and Brain Sciences, 1*(1), 21-29.

Ding, X., Xu, J., Chen, G., & Xu, C. (2016). Beyond smartphone overuse: identifying addictive mobile apps. *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems*, (pp. 2821-2828).

Escoffery, C. (2018). Gender Similarities and Differences for e-Health Behaviors Among U.S. Adults. *Telemedicine and e-Health, 24*(5), 335–343. doi:doi:10.1089/tmj.2017.0136

Farenga, S. J., & Joyce, B. A. (1999). Intentions of young students to enroll in science courses in the future: An examination of gender differences. *Science education, 83*(1), 55-75.

Gonzalez, H. B. (2021). *Science, technology, engineering, and mathematics (STEM) education: A primer.* Washington, DC: Congressional Research Service, Library of Congress.

House of Commons Digital, Culture, Media and Sport Committee.. (2019). *Disinformation and 'fake news': Final report.* London: House of Commons. Retrieved from https://publications.parliament.uk/pa/cm201719/cmselect/cmcumeds/1791/1791.pdf

Jabour, A., Rehman, W., Idrees, S., Thanganadar, H., Hira, K., & Alarifi, M. (2021). The adoption of mobile health applications among University students in health colleges. *Journal of Multidisciplinary Healthcare, 14*, 1267–1273.

Kang, J., Hense, J., Scheersoi, A., & Keinonen, T. (2019). Gender study on the relationships between science interest and future career perspectives. *International Journal of Science Education, 41*(1), 80-101.

Kelley, T. R., & Knowles, J. G. (2016). A conceptual framework for integrated STEM education. *International Journal of STEM education, 3*(1), 1-11.

Knopes, J. (2019). Science, Technology, and Human Health: The Value of STS in Medical and Health Humanities Pedagogy. *Journal of Medical Humanities*.

Konrad, A. M., Ritchie Jr, J. E., Lieb, P., & Corrigall, E. (2000). Sex differences and similarities in job attribute preferences: a meta-analysis. *Psychological bulletin, 126*(4), 593.

Lee, Y. K., Chang, C. T., Lin, Y., & Cheng, Z. H. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in human behavior, 31*, 373-383.

López-Iñesta, E., Botella, C., Rueda, S., Forte, A., & Marzal, P. (2020). Towards breaking the gender gap in Science, Technology, Engineering and Mathematics. *IEEE, 15*(3), 233-241.

McNeil, I. (2002). *An Encyclopedia of the History of Technology.* (I. McNeil, Ed.) Taylor & Francis.

Monge Roffarello, A., & De Russis, L. (2019). The race towards digital wellbeing: Issues and opportunities. *In Proceedings of the CHI conference on human factors in computing systems*, (pp. 1-14).

Neuhaus, C. (2006). Age and the Internet: A review of the literature. International Journal of Human-Computer Studies, 64(3), 257-268.

Nougayrède, N. (2018, 1 31). *In this age of propaganda, we must defend ourselves. Here's how*. Retrieved 3 20, 2022, from theguardian: https://www.theguardian.com/commentisfree/2018/jan/31/propaganda-defend-russia-technology

Perignat, E., & Katz-Buonincontro, J. (2019). STEAM in practice and research: An integrative literature review. *Thinking Skills and Creativity, 31*, 31–43.

Posetti, J. &. (2018). *A short guide to the history of 'fake news' and disinformation.* International Center for Journalists.

Posetti, J. (2018). *News industry transformation: digital technology, social platforms and the spread of misinformation and disinformation. Journalism,'fake news' and disinformation: A handbook for journalism education and training.* Unesco.

Rich, E. (2018). Gender, health and physical activity in the digital age: between postfeminism and pedagogical possibilities. *SPORT, EDUCATION AND SOCIETY, 23*(8), 736-747. doi:10.1080/13573322.2018.1497593

Talla, A. (2020). *Handbook of Research on Digital Devices for Inclusivity and Engagement in Libraries.* IGI Global. doi:10.4018/978-1-5225-9034-7

Thorpe, R. (2015). Understanding the Impact of Education on Society. In Education Matters (pp. 1-15). Springer. https://doi.org/10.1007/978-1-4471-6444-5_1

Turkle, S. (1995). Life on the Screen: Identity in the Age of the Internet. Simon & Schuster.

UNDP. (2015). *Sustainable Development Goals*. Retrieved from United Nation Development Program: https://www.undp.org/sustainable-development-goals#:~:text=The%20Sustainable%20Development%20Goals%20(SDGs)%2C%20also%20known%20as%20the,people%20enjoy%20peace%20and%20prosperity.

Vanden Abeele, M. M. (2021). Digital wellbeing as a dynamic construct. *Communication Theory, 31*(4), 932-955.

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science, 259*, 1146–1151.

Wang, M. T., & Degol, J. L. (2017). Gender gap in science, technology, engineering, and mathematics (STEM): Current knowledge, implications for practice, policy, and future directions. *Educational psychology review, 29*(1), 119-140.

Wang, M. T., & Degol, J. L. (2017). Gender gap in science, technology, engineering, and mathematics (STEM): Current knowledge, implications for practice, policy, and future directions. *Educational psychology review, 29*(1), 119-140.

Wartella, E., Rideout, V., Montague, H., Beaudoin-Ryan, L., & Lauricella, A. (2016). Teens, Health and Technology: A National Survey. *Media and Communication, 4*(3), 13-23.

Webster, A., & Wyatt, S. (2020). *Health, technology and society.* Singapore: Springer.

Wei, X., Zhang, Z., Zhang, M., Chen, W., & Zeng, D. D. (2019). Combining Crowd and Machine Intelligence to Detect False News on Social Media. *MIS Quarterly.*