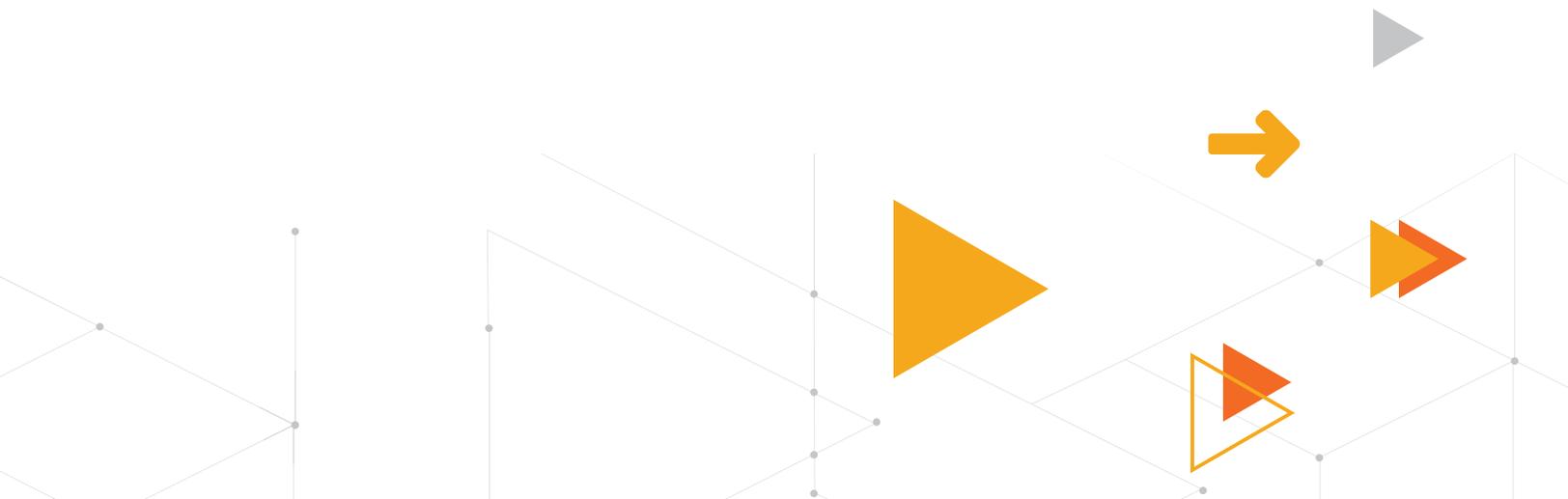




International Youth Perspectives of Technology and Careers

Country coverage: Australia | Brazil | Canada | India | Japan
Netherlands | Saudi Arabia | United Arab Emirates
South Africa | United Kingdom | United States



GLOBAL INTRODUCTION

Technology plays a pivotal role in the lives of 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



594.7

million

Number of lower and upper secondary students worldwide
Source: UNESCO | 2018 estimate

\$5.0

trillion

Total global spending on technology; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

1 in 2

% currently considering or may consider in the future a career in technology

66%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 55% via computer

54%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people around the world are thinking about their career options and a majority (57%) have some idea of the path they would like to pursue. A career in some aspect of technology is something 1 in 2 are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, designing apps for smartphones, web design, and working in emerging technology like robotics were popular among teenagers. The data suggests that certain fields, such as working in some facet of emerging technology, resonated more with boys than girls.

An analysis of what teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not, it is a mischaracterization.

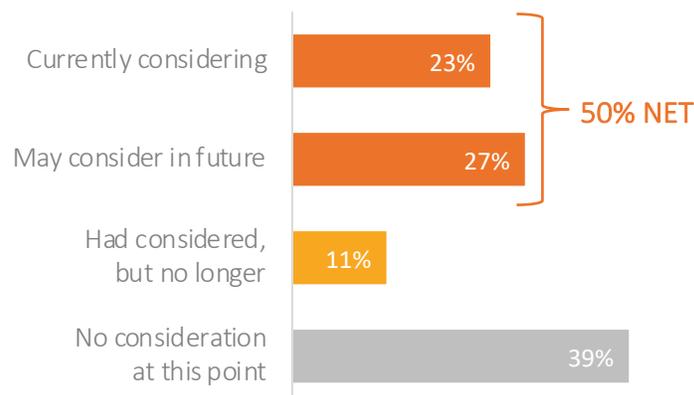
A slightly higher number of girls in the 13 to 18-year-old age range hold negative perceptions when compared to boys. Relatedly, fewer girls report receiving encouragement from parents, teachers, peers, or others to consider a career in technology. These, and other factors, inevitably contribute to lower rates of consideration for a career in technology. Given the pressing need to expand the pipeline to meet current and longer-term tech talent labor shortages, it's imperative that employers, educators, policy-makers, and organizations such as CompTIA continue to work to address these challenges.

ADDRESSING THE ENCOURAGEMENT GAP

52% vs. 38%

According to the data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. Just about a third of young people report knowing someone personally who works in the tech field. More boys than girls and those in larger cities report knowing of more people who work in a technology field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter – again more girls than boys and those living in smaller population centers hold this view. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the ‘confidence gap’ is a perception shared by almost half the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Tech too competitive / too difficult to enter
2. Cost / lack of affordable schooling / training options
3. Lack of preparation / exposure to tech in school
4. Limited tech job opportunities in my local area
5. Lack of mentors / guidance in how to pursue a career in tech

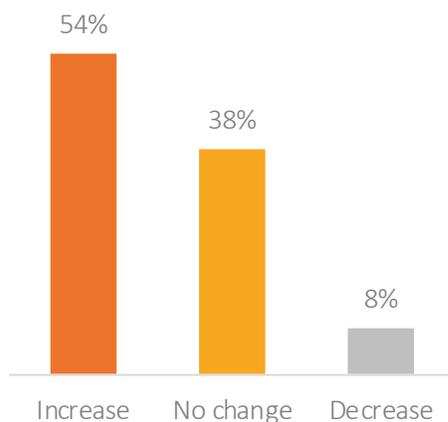
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, slightly more than half of young people expect technology to further shape their personal and work lives.

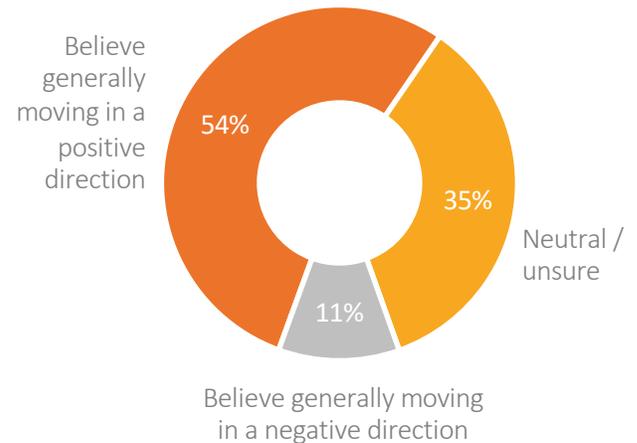
A slightly greater proportion of teenagers in the emerging economies covered by this study believe their reliance on technology will increase.

This CompTIA study finds that 9 out of 10 teenagers connect to the internet on their mobile phones, a confirmation of the “anywhere, anytime” approach to technology. According to Marketing Resources Incorporated, mobile app [usage](#) across all users worldwide is topped by communications, social, gaming, and music/entertainment apps.

Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 62% believing it is moving in a positive direction compared to 45% of girls. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concern with the future direction of technology is the impact on privacy and control over personal data. This concern is especially a concern among young women. Other factors playing into the negative perception are cyberbullying (more of a concern among teenage girls when compared to teenage boys), apps being too much of a distraction, and growing cybersecurity risks. More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Tech consistently faster, better, more features
2. More choices / more user needs met
3. Innovation / next breakthrough could further improve lives
4. Narrowing digital divide / expanding access to information, services, etc.
5. Free or “freemium” access to apps and services

FUTURE OF WORK

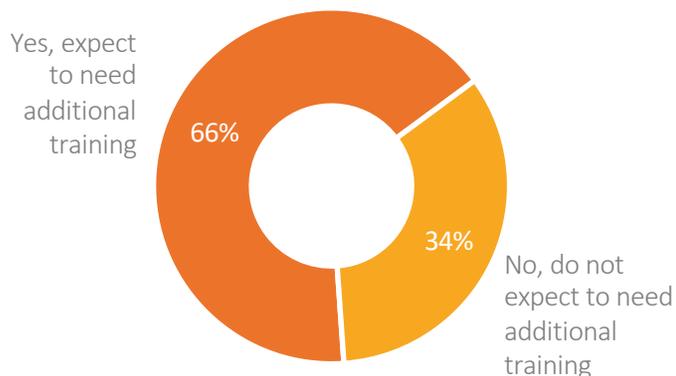
While technology-induced change to the workforce has been a facet of life since the industrial revolution, recent advances in artificial intelligence and automating technologies have raised new questions – and new concerns.

These discussions are not lost on young people. Six in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. Less than 1 in 5 note feeling that their jobs will not be replaced by the technologies of the future. While concerns about future jobs are high, the majority of teenagers are not personally aware of someone who has lost a job as a result of automation.

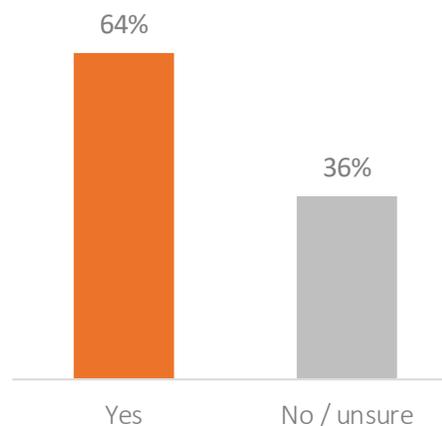
A [report](#) from the consultancy McKinsey & Company about automation and the future of the workforce details the skills shifts that automation and AI technologies are likely to bring – primarily skills associated with structured, repetitive tasks in the short-term. Offsetting the diminishing need for skills that could potentially be automated is the growth in high skill areas. The study anticipates that the need for advanced IT/programming skills could grow as much as 90% between 2016 and 2030. It also notes the need to develop foundational digital skills for the jobs of the future where just about every worker is a technologist on some level.

According to CompTIA's research, the majority of young people astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

Automation and the need for additional tech training



Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Influences generating interest in tech careers

1. Personal use of technology / hobby
2. Technology class in school
3. Parent, sibling, teacher, friend, etc.
4. Technology club / organization in school
5. School-sponsored work program / apprenticeship in technology

AUSTRALIA INTRODUCTION

Technology plays a pivotal role in the lives of Australia’s 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among Australia’s young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in Australia are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



2.7 million

Number of lower and upper secondary students in Australia
Source: UNESCO | 2017 estimate

\$88.2 billion

Spending on technology in Australia; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

1 in 2

% currently considering or may consider in the future a career in technology

61%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 67% via computer

51%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in Australia are thinking about their career options and a majority (56%) have some idea of the path they would like to pursue. A career in some aspect of technology is something close to a majority (45%) are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, working with technology to solve problems, and working in emerging technology like robotics were popular among teenagers. The data suggests that certain fields, such as working in some facet of emerging technology, resonated more with boys than girls.

An analysis of what Australian teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not, it is a mischaracterization.

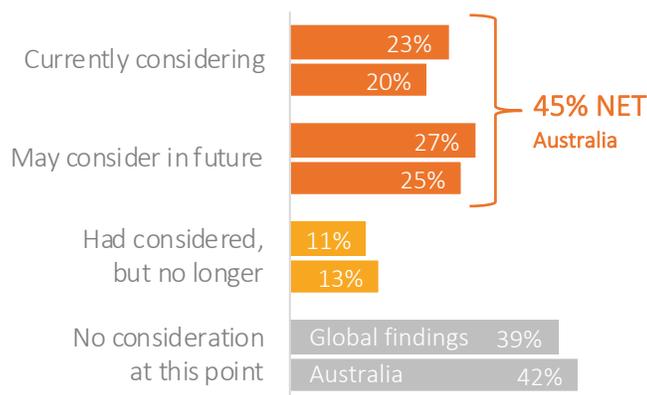
A slightly higher number of girls in the 13 to 18-year-old age range hold negative perceptions when compared to boys. Relatedly, fewer girls report receiving encouragement from parents, teachers, peers, or others to consider a career in technology. These, and other factors, inevitably contribute to lower rates of consideration for a career in technology. Given the pressing need to expand the pipeline to meet current and longer-term tech talent labor shortages, it's imperative that employers, educators, policy-makers, and organizations such as CompTIA continue to work to address these challenges.

ADDRESSING THE ENCOURAGEMENT GAP

55% vs. 33%

According to the Australia data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. A little more than a third (37%) of young people in Australia report knowing someone personally who works in the tech field. More boys than girls report knowing of more people who work in a technology field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter – again more girls than boys and those living in smaller population centers in Australia hold this view. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the ‘confidence gap’ is a perception shared by almost half the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Limited tech job opportunities in my local area
2. Lack of preparation / exposure to tech in school
3. Challenge of balancing schooling/training with work and life
4. Lack of mentors / guidance in how to pursue career in tech
5. Cost / lack of affordable schooling/training options

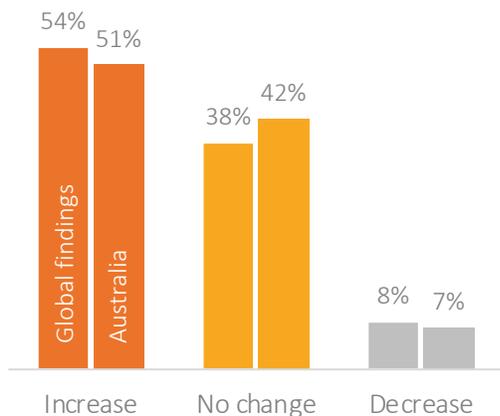
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, slightly more than half of young people in Australia expect technology to further shape their personal and work lives.

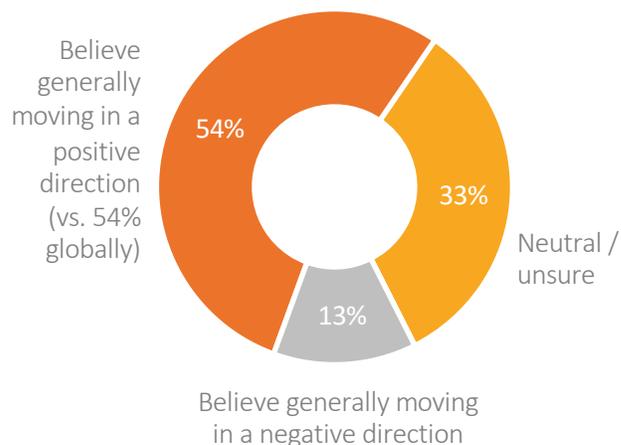
A slightly greater proportion of teenagers in the emerging economies covered by this study believe their reliance on technology will increase.

This CompTIA study finds that 9 out of 10 teenagers connect to the internet on their mobile phones, a confirmation of the “anywhere, anytime” approach to technology. According to Marketing Resources Incorporated, mobile app [usage](#) across all users in Australia is topped by social, and then communications, music/entertainment, and gaming apps.

Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people in Australia generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 71% believing it is moving in a positive direction compared to 37% of girls. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concern with the future direction of technology is the impact on privacy and control over personal data. This concern is especially a concern among young women. Other factors playing into the negative perception are cyberbullying, apps being too much of a distraction, and growing cybersecurity risks (these factors were more of a concern among teenage girls when compared to teenage boys). More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Innovation / next breakthrough could further improve lives
2. More choices / more user needs met
3. Tech consistently faster, better, more features
4. Narrowing digital divide / expanding access to information, services, etc.
5. Free or “freemium” access to apps / services

FUTURE OF WORK

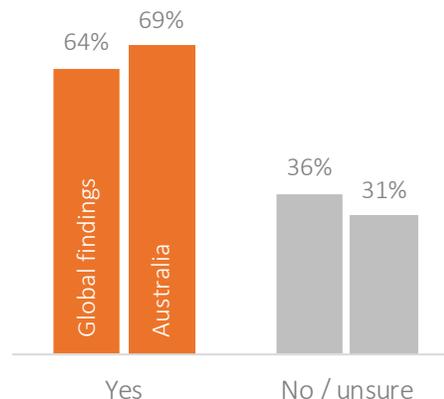
While technology-induced change to the workforce has been a facet of life since the industrial revolution, recent advances in artificial intelligence and automating technologies have raised new questions – and new concerns.

These discussions are not lost on young people in Australia. Seven in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. Less than 1 in 5 note feeling that their jobs will not be replaced by the technologies of the future. While concerns about future jobs are high, the majority of teenagers are not personally aware of someone who has lost a job as a result of automation.

A [report](#) from the consultancy McKinsey & Company about automation and the future of the workforce details the skills shifts that automation and AI technologies are likely to bring – primarily skills associated with structured, repetitive tasks in the short-term. Offsetting the diminishing need for skills that could potentially be automated is the growth in high skill areas. The study anticipates that the need for advanced IT/programming skills could grow as much as 90% between 2016 and 2030. It also notes the need to develop foundational digital skills for the jobs of the future where just about every worker is a technologist on some level.

According to CompTIA’s research, the majority of young people in Australia astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

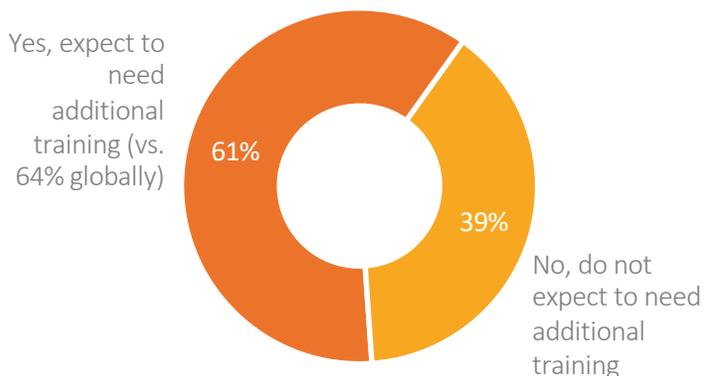
Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Impact of automation on additional tech training



Influences generating interest in tech careers

1. Personal use of technology / hobby
2. Technology class in school
3. Parent, sibling, teacher, friend, etc.
4. Technology club / organization in school
5. Non-school related work program / apprenticeship in technology

BRAZIL INTRODUCTION

Technology plays a pivotal role in the lives of Brazil’s 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among Brazil’s young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in Brazil are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



23.1 million

Number of lower and upper secondary students in Brazil
Source: UNESCO | 2017 estimate

\$106.4 billion

Spending on technology in Brazil; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

7 in 10

% currently considering or may consider in the future a career in technology

74%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 45% via computer

67%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in Brazil are thinking about their career options and a majority (54%) have some idea of the path they would like to pursue. A career in some aspect of technology is something 7 in 10 are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing apps for mobile phones, designing video games, web design, and working in emerging technology like robotics were popular among teenagers. The data suggests that certain fields, such as designing video games or working in cybersecurity, resonated more with boys than girls.

An analysis of what Brazilian teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not it is a mischaracterization.

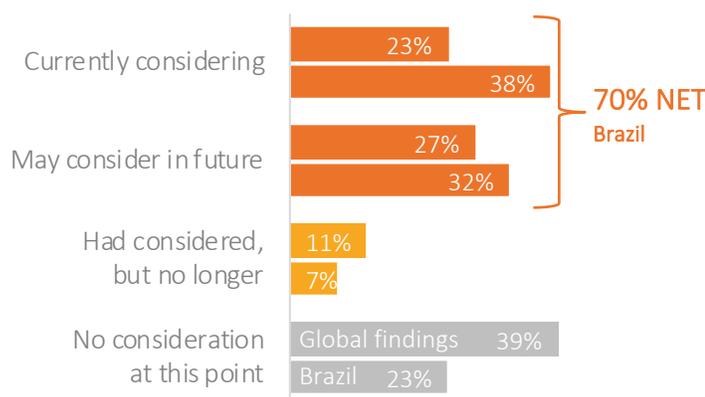
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ADDRESSING THE ENCOURAGEMENT GAP

51% vs. 43%

According to the Brazil data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. A little more than a third (37%) of young people in Brazil report knowing someone personally who works in the tech field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter – again more girls than boys in Brazil hold this view. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the ‘confidence gap’ is a perception shared by half the teenagers surveyed (50%). The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Tech too competitive / too difficult to enter
2. Cost / lack of affordable schooling/ training options
3. Lack of preparation / exposure to tech in school
4. Lack of mentors / guidance in how to pursue a career in tech
5. Challenge of balancing schooling/training with work and life

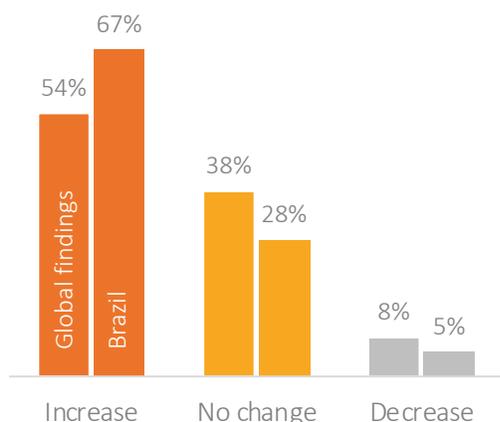
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, a clear majority of young people in Brazil expect technology to further shape their personal and work lives.

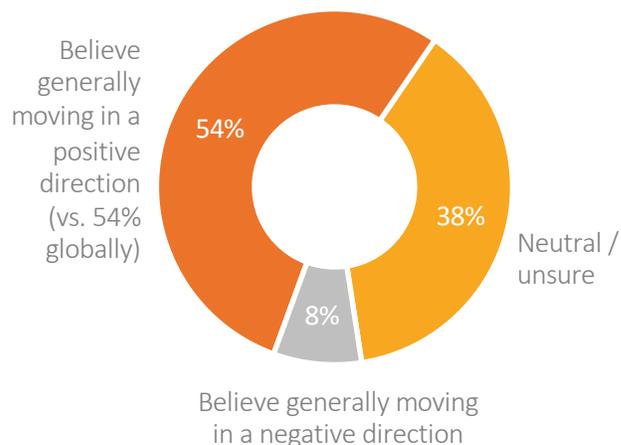
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Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people in Brazil generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 61% believing it is moving in a positive direction compared to 47% of girls. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concern with the future direction of technology is the impact on privacy and control over personal data. Other factors playing into the negative perception are cyberbullying, apps being too much of a distraction, and growing cybersecurity risks (cybersecurity risks were more of a concern among boys than girls). More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Tech consistently faster, better, more features
2. Innovation / next breakthrough could further improve lives
3. Free or “freemium” access to apps and services
4. More choices / more user needs met
5. Narrowing digital divide / expanding access to information, services, etc.

FUTURE OF WORK

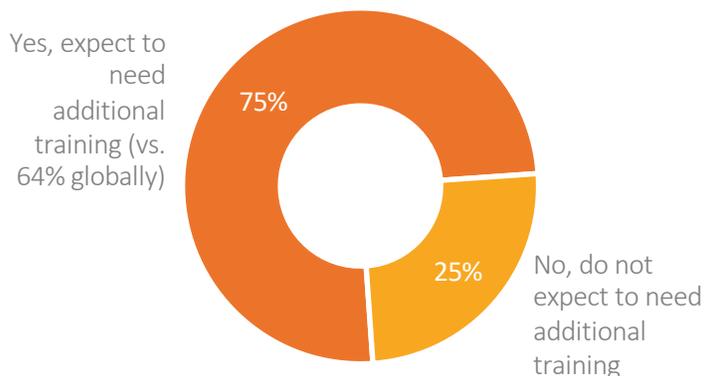
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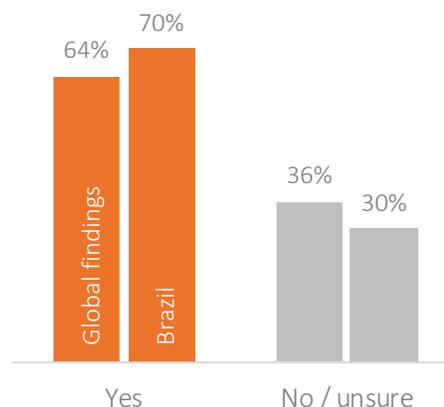
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According to CompTIA's research, the majority of young people in Brazil astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

Impact of automation on additional tech training



Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Influences generating interest in tech careers

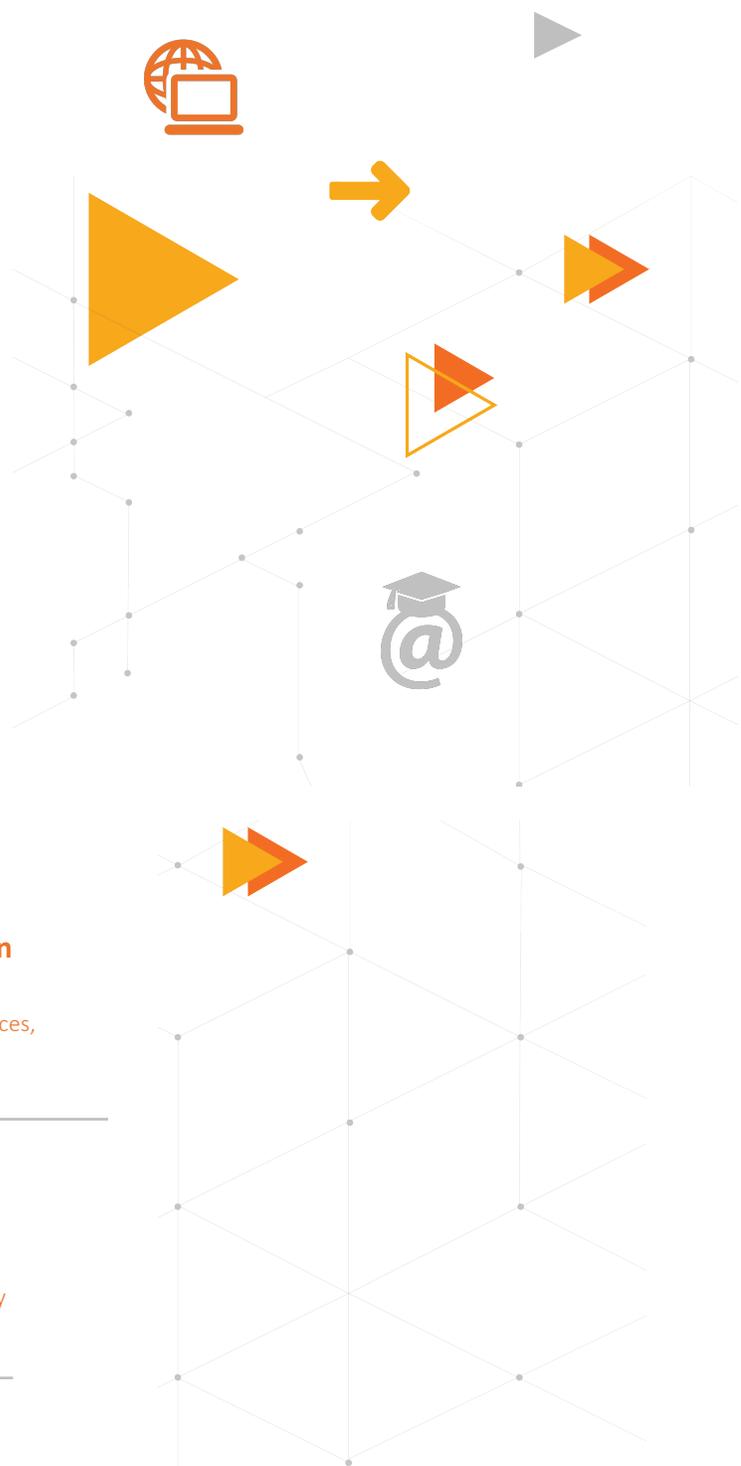
1. Personal use of technology / hobby
2. Parent, sibling, teacher, friend, etc.
3. Technology class in school
4. Celebrity or well known person associated with technology
5. Part-time job, gig, or related with exposure to technology

CANADA INTRODUCTION

Technology plays a pivotal role in the lives of Canada's 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among Canada's young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in Canada are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



2.7 million

Number of lower and upper secondary students in Canada
Source: UNESCO | 2017 estimate

\$106.5 billion

Spending on technology in Canada; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

1 in 2

% currently considering or may consider in the future a career in technology

63%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 68% via computer

49%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in Canada are thinking about their career options and a majority (62%) have some idea of the path they would like to pursue. A career in some aspect of technology is something almost 1 in 2 (47%) are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, designing apps for smartphones and web design, and working in emerging technology like robotics were popular among teenagers. The data suggests that certain fields, such as working in some facet of emerging technology, resonated more with boys than girls.

An analysis of what Canadian teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not it is a mischaracterization.

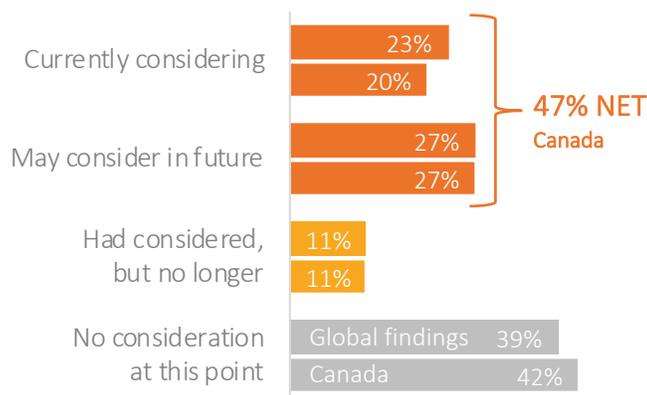
A slightly higher number of girls in the 13 to 18-year-old age range hold negative perceptions when compared to boys. Relatedly, fewer girls report receiving encouragement from parents, teachers, peers, or others to consider a career in technology. These, and other factors, inevitably contribute to lower rates of consideration for a career in technology. Given the pressing need to expand the pipeline to meet current and longer-term tech talent labor shortages, it's imperative that employers, educators, policy-makers, and organizations such as CompTIA continue to work to address these challenges.

ADDRESSING THE ENCOURAGEMENT GAP

51% vs. 36%

According to the Canada data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. Less than half (43%) of young people in Canada report knowing someone personally who works in the tech field. More boys than girls report knowing of more people who work in a technology field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the 'confidence gap' is a perception shared by more than half (55%) the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Tech is too competitive / too difficult to enter
2. Cost / lack of affordable schooling/ training options
3. Lack of preparation / exposure to tech in school
4. Lack of mentors / guidance in how to pursue a career in tech
5. Limited tech job opportunities in my local area

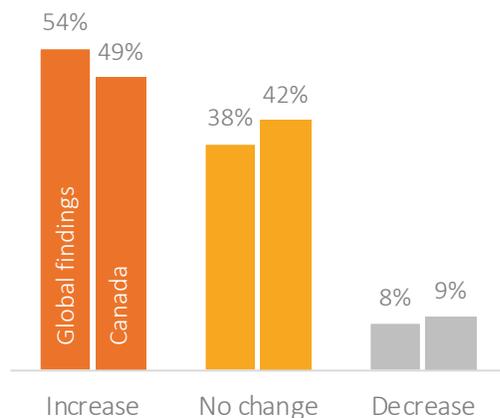
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, half of young people in Canada expect technology to further shape their personal and work lives.

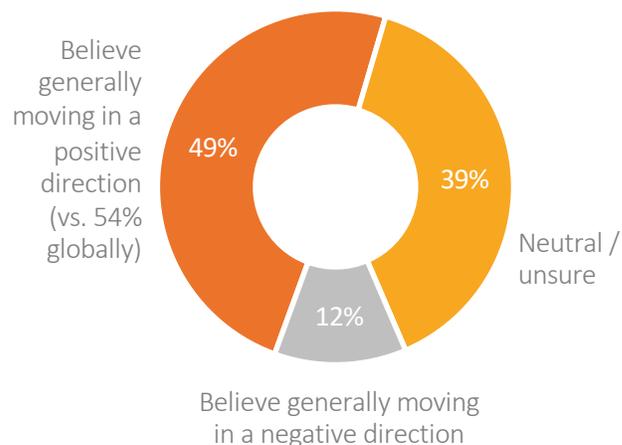
A slightly greater proportion of teenagers in the emerging economies covered by this study believe their reliance on technology will increase.

This CompTIA study finds that 9 out of 10 teenagers connect to the internet on their mobile phones, a confirmation of the “anywhere, anytime” approach to technology. According to Marketing Resources Incorporated, mobile app [usage](#) across all users in Canada is topped by gaming, and then shopping, social, and communications apps.

Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people in Canada generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 55% believing it is moving in a positive direction compared to 43% of girls. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concern with the future direction of technology is the impact on privacy and control over personal data. This concern is especially a concern among young women. Other factors playing into the negative perception are cyberbullying (more of a concern among teenage girls when compared to teenage boys), apps being too much of a distraction, and growing cybersecurity risks. More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Innovation / next breakthrough could further improve lives
2. Tech consistently faster, better, more features
3. More choices / more user needs met
4. Narrowing digital divide / expanding access to information, services, etc.
5. Free or “freemium” access to apps and services

FUTURE OF WORK

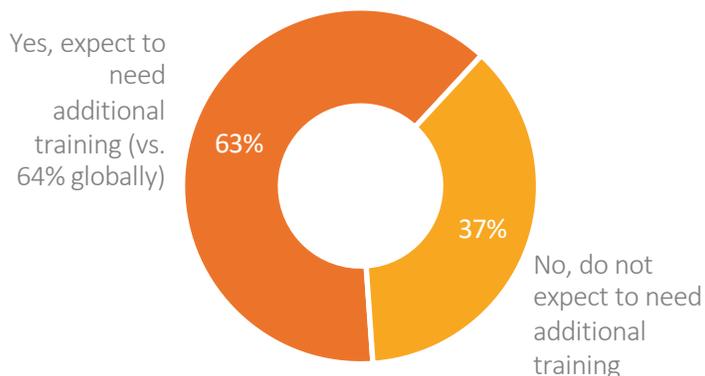
While technology-induced change to the workforce has been a facet of life since the industrial revolution, recent advances in artificial intelligence and automating technologies have raised new questions – and new concerns.

These discussions are not lost on young people in Canada. Seven in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. Less than 1 in 5 note feeling that their jobs will not be replaced by the technologies of the future. While concerns about future jobs are high, the majority of teenagers are not personally aware of someone who has lost a job as a result of automation.

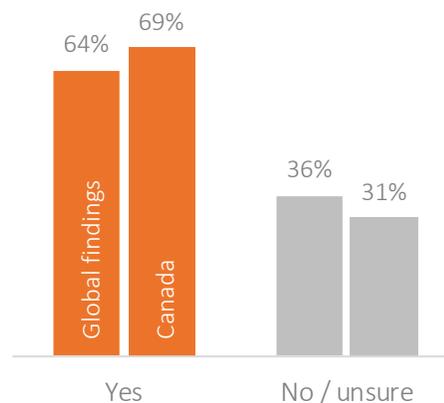
A [report](#) from the consultancy McKinsey & Company about automation and the future of the workforce details the skills shifts that automation and AI technologies are likely to bring – primarily skills associated with structured, repetitive tasks in the short-term. Offsetting the diminishing need for skills that could potentially be automated is the growth in high skill areas. The study anticipates that the need for advanced IT/programming skills could grow as much as 90% between 2016 and 2030. It also notes the need to develop foundational digital skills for the jobs of the future where just about every worker is a technologist on some level.

According to CompTIA's research, the majority of young people in Canada astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

Impact of automation on additional tech training



Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Influences generating interest in tech careers

1. Personal use of technology / hobby
2. Technology class in school
3. Parent, sibling, teacher, friend, etc.
4. Part-time job, gig, or related with exposure to technology
5. Technology club in school

INDIA INTRODUCTION

Technology plays a pivotal role in the lives of India's 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among India's young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in India are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



129.8

million

Number of lower and upper secondary students in India
Source: UNESCO | 2017 estimate

\$111.1 billion

Spending on technology in India; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

1 in 2

% currently considering or may consider in the future a career in technology

64%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 27% via computer

55%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in India are thinking about their career options and a majority (61%) have some idea of the path they would like to pursue. A career in some aspect of technology is something 1 in 2 (52%) are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, designing apps for smartphones, web design, and working in emerging technology like robotics were popular among teenagers. The data suggests that certain fields, such as working in some facet of emerging technology, resonated more with boys than girls.

An analysis of what Indian teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not it is a mischaracterization.

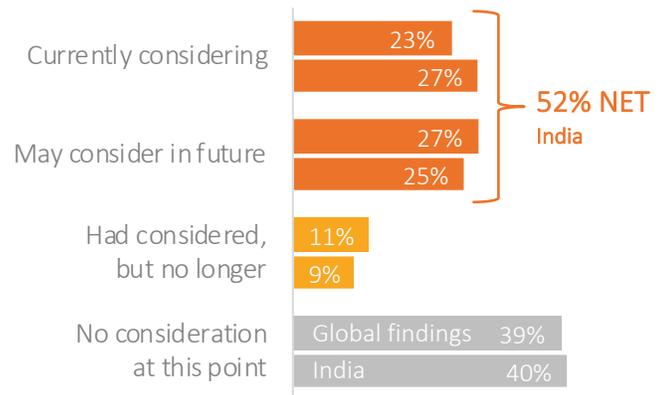
A slightly higher number of girls in the 13 to 18-year-old age range hold negative perceptions when compared to boys. Relatedly, fewer girls report receiving encouragement from parents, teachers, peers, or others to consider a career in technology. These, and other factors, inevitably contribute to lower rates of consideration for a career in technology. Given the pressing need to expand the pipeline to meet current and longer-term tech talent labor shortages, it's imperative that employers, educators, policy-makers, and organizations such as CompTIA continue to work to address these challenges.

ADDRESSING THE ENCOURAGEMENT GAP

64% vs. 52%

According to the India data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. Less than half (43%) of young people in India report knowing someone personally who works in the tech field. More boys than girls report knowing of more people who work in a technology field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the 'confidence gap' is a perception shared by almost half the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Tech too competitive / too difficult to enter
2. Cost / lack of affordable schooling / training options
3. Limited tech job opportunities in my local area
4. Lack of mentors / guidance in how to pursue a career in tech
5. Lack of preparation / exposure to tech in school

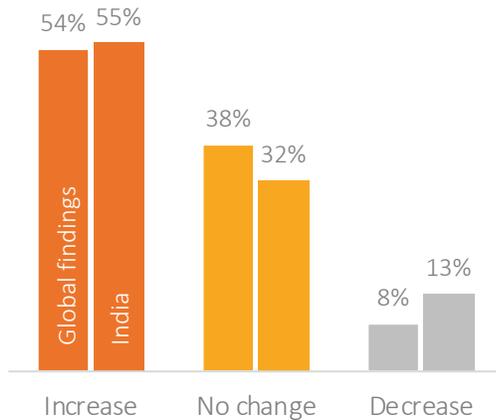
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, slightly more than half of young people in India expect technology to further shape their personal and work lives.

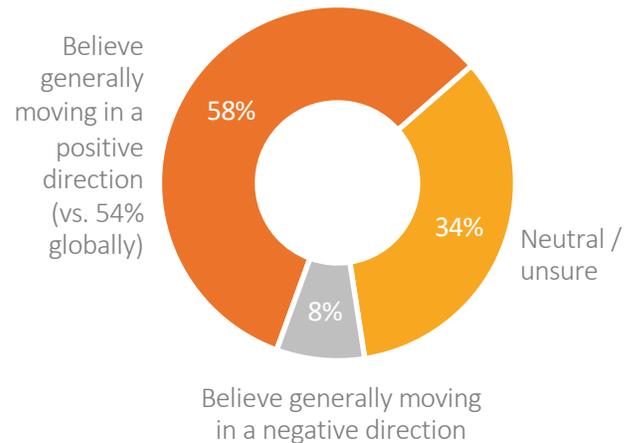
A slightly greater proportion of teenagers in the emerging economies covered by this study believe their reliance on technology will increase.

This CompTIA study finds that 9 out of 10 teenagers connect to the internet on their mobile phones, a confirmation of the “anywhere, anytime” approach to technology. According to Marketing Resources Incorporated, mobile app [usage](#) across all users in India is topped by communications, and then music/entertainment, and social apps.

Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people in India generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 61% believing it is moving in a positive direction compared to 55% of girls. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concerns with the future direction of technology are apps being too much of a distraction and growing cybersecurity risks. Other factors playing into the negative perception are the impact on privacy and control over personal data, and cyberbullying. More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Tech consistently faster, better, more features
2. More choices / more user needs met
3. Innovation / next breakthrough could further improve lives
4. Free or “freemium” access to apps and services
5. Narrowing digital divide / expanding access to information, services, etc.

FUTURE OF WORK

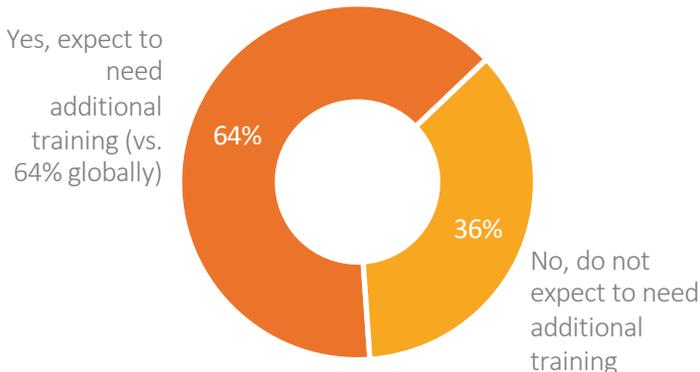
While technology-induced change to the workforce has been a facet of life since the industrial revolution, recent advances in artificial intelligence and automating technologies have raised new questions – and new concerns.

These discussions are not lost on young people in India. Six in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. Less than 1 in 5 note feeling that their jobs will not be replaced by the technologies of the future. While concerns about future jobs are high, the majority of teenagers are not personally aware of someone who has lost a job as a result of automation.

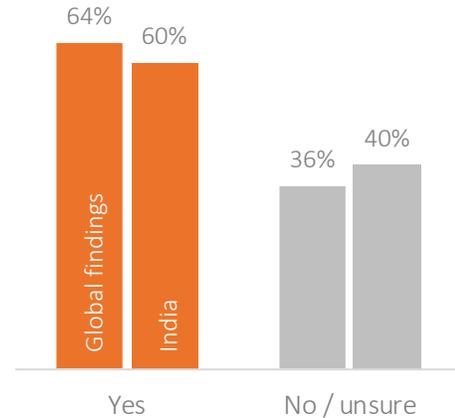
A [report](#) from the consultancy McKinsey & Company about automation and the future of the workforce details the skills shifts that automation and AI technologies are likely to bring – primarily skills associated with structured, repetitive tasks in the short-term. Offsetting the diminishing need for skills that could potentially be automated is the growth in high skill areas. The study anticipates that the need for advanced IT/programming skills could grow as much as 90% between 2016 and 2030. It also notes the need to develop foundational digital skills for the jobs of the future where just about every worker is a technologist on some level.

According to CompTIA's research, the majority of young people in India astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

Impact of automation on additional tech training



Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Influences generating interest in tech careers

1. Personal use of technology / hobby
2. Technology class in school
3. Parent, sibling, teacher, friend, etc.
4. School sponsored work program / apprenticeship in technology
5. Technology club / organization in school

JAPAN INTRODUCTION

Technology plays a pivotal role in the lives of Japan’s 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among Japan’s young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in Japan are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



7.1 million

Number of lower and upper secondary students in Japan
Source: UNESCO | 2017 estimate

\$338.6 billion

Spending on technology in Japan; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

4 in 10

% currently considering or may consider in the future a career in technology

60%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 38% via computer

43%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in Japan are thinking about their career options and almost a majority (46%) have some idea of the path they would like to pursue. A career in some aspect of technology is something a little more than a third (36%) are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, designing apps for smartphones, and web design were popular among teenagers. The data suggests that certain fields, such as working in some facet of emerging technology, resonated more with boys than girls.

An analysis of what Japanese teenagers think about a job in technology reflect largely negative, and a couple of secondary positive perceptions. Chief among the positives is that technology jobs pay well, being fun, interesting work, and the way technology can be used to solve problems. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not it is a mischaracterization.

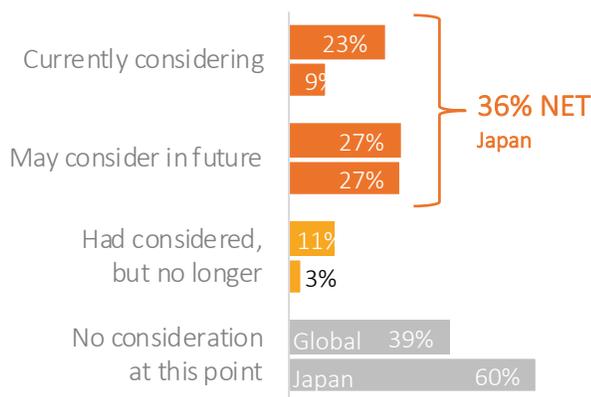
A slightly higher number of girls in the 13 to 18-year-old age range hold negative perceptions when compared to boys. Relatedly, fewer girls report receiving encouragement from parents, teachers, peers, or others to consider a career in technology. These, and other factors, inevitably contribute to lower rates of consideration for a career in technology. Given the pressing need to expand the pipeline to meet current and longer-term tech talent labor shortages, it's imperative that employers, educators, policy-makers, and organizations such as CompTIA continue to work to address these challenges.

ADDRESSING THE ENCOURAGEMENT GAP

35% vs. 16%

According to the Japan data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. Just about 1 in 10 (12%) young people in Japan report knowing someone personally who works in the tech field. More boys than girls report knowing of more people who work in a technology field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter—more boys than girls in Japan hold this view. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the 'confidence gap' is a perception shared by almost half (44%) the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Lack of preparation / exposure to tech in school
2. Cost / lack of affordable schooling / training options
3. Tech too competitive / too difficult to enter
4. Lack of mentors / guidance in how to pursue a career in tech
5. Limited tech job opportunities in my local area

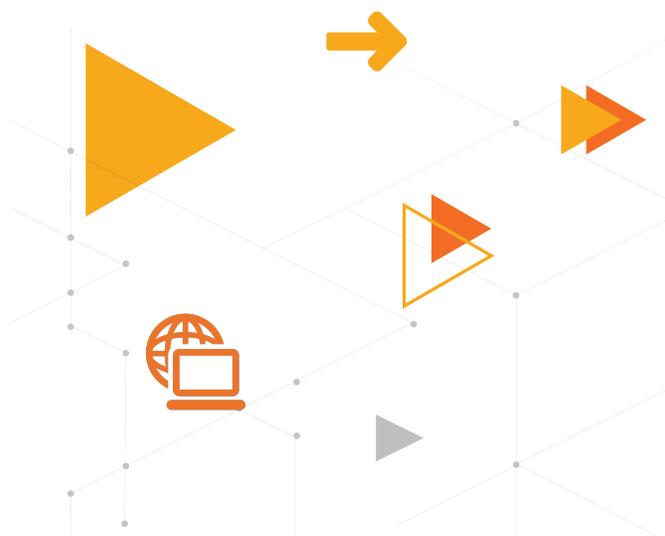
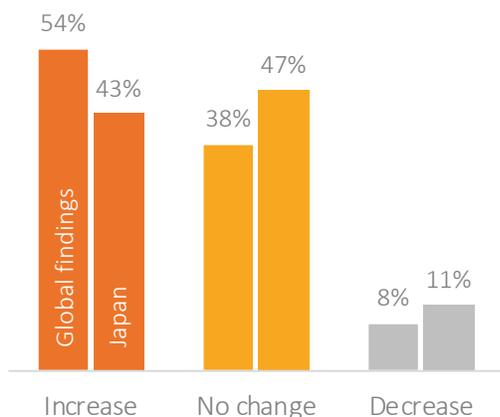
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, slightly less than half of young people in Japan expect technology to further shape their personal and work lives.

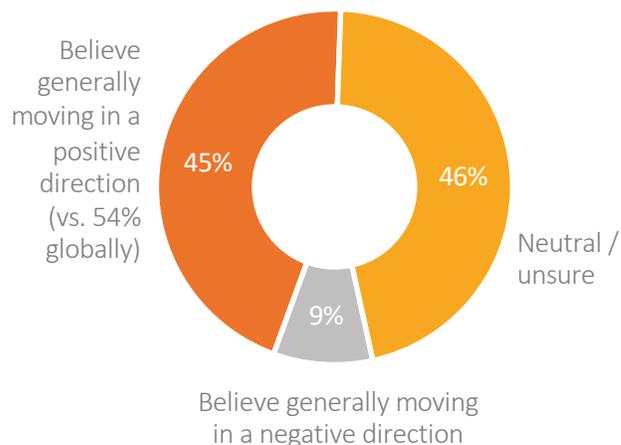
A slightly greater proportion of teenagers in the emerging economies covered by this study believe their reliance on technology will increase.

This CompTIA study finds that 9 out of 10 teenagers connect to the internet on their mobile phones, a confirmation of the “anywhere, anytime” approach to technology. According to Marketing Resources Incorporated, mobile app [usage](#) across all users in Japan is topped by gaming, and then communications, music/entertainment, and social apps.

Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people in Japan generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 53% believing it is moving in a positive direction compared to 36% of girls. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concerns with the future direction of technology are the impact on privacy and control over personal data and cyberbullying. Other factors playing into the negative perception are growing cybersecurity risks (more of a concern among boys than girls in Japan), apps being too much of a distraction, and too much commercialization. More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Tech consistently faster, better, more features
2. More choices / more user needs met
3. Innovation / next breakthrough could further improve lives
4. Free or “freemium” access to apps and services
5. Narrowing digital divide / expanding access to information, services

FUTURE OF WORK

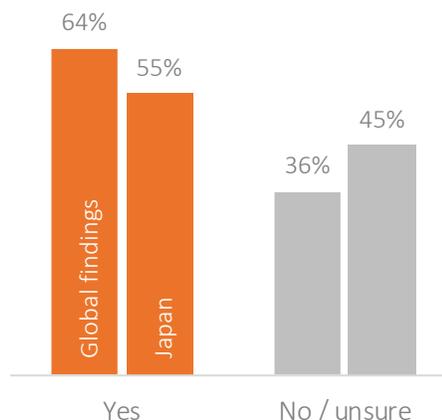
While technology-induced change to the workforce has been a facet of life since the industrial revolution, recent advances in artificial intelligence and automating technologies have raised new questions – and new concerns.

These discussions are not lost on young people in Japan. Almost 6 in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. Less than 1 in 5 note feeling that their jobs will not be replaced by the technologies of the future. While concerns about future jobs are high, the majority of teenagers are not personally aware of someone who has lost a job as a result of automation.

A [report](#) from the consultancy McKinsey & Company about automation and the future of the workforce details the skills shifts that automation and AI technologies are likely to bring – primarily skills associated with structured, repetitive tasks in the short-term. Offsetting the diminishing need for skills that could potentially be automated is the growth in high skill areas. The study anticipates that the need for advanced IT/programming skills could grow as much as 90% between 2016 and 2030. It also notes the need to develop foundational digital skills for the jobs of the future where just about every worker is a technologist on some level.

According to CompTIA’s research, the majority of young people in Japan astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

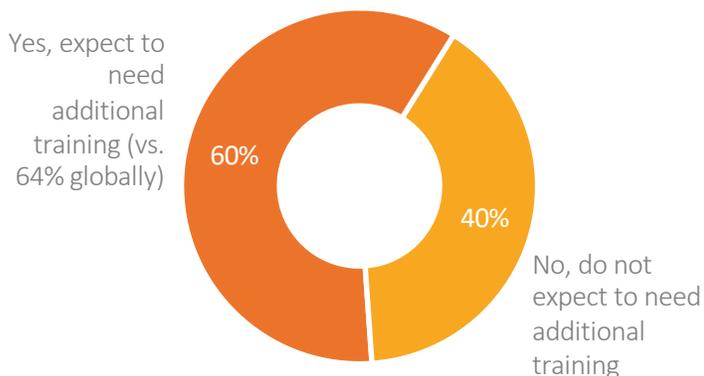
Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Impact of automation on additional tech training



Influences generating interest in tech careers

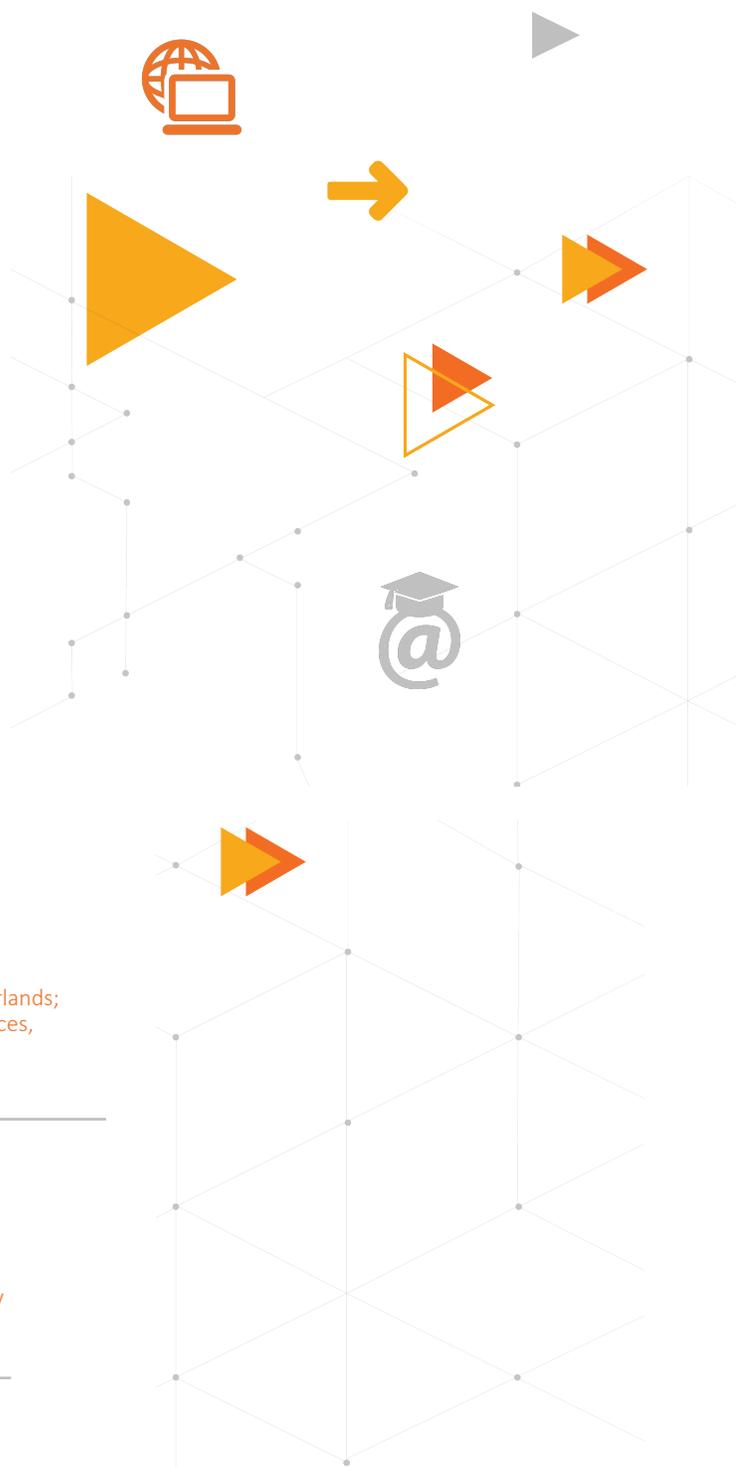
1. Personal use of technology / hobby
2. Parent, sibling, teacher, friend, etc.
3. Part-time job, gig, or related with exposure to technology
4. Technology club / organization in school
5. Non-school related work program

NETHERLANDS INTRODUCTION

Technology plays a pivotal role in the lives of the Netherlands' 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among the Netherlands' young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in the Netherlands are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



1.7 million

Number of lower and upper secondary students in the Netherlands
Source: UNESCO | 2017 estimate

\$55.9 billion

Spending on technology in the Netherlands; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

1 in 2

% currently considering or may consider in the future a career in technology

62%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 79% via computer

49%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in the Netherlands are thinking about their career options and a majority (50%) have some idea of the path they would like to pursue. A career in some aspect of technology is something almost half (46%) are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, designing apps for smartphones, web design, and working in emerging technology like robotics were popular among teenagers. The data suggests that certain fields, such as working in some facet of emerging technology, resonated more with boys than girls.

An analysis of what Dutch teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not it is a mischaracterization.

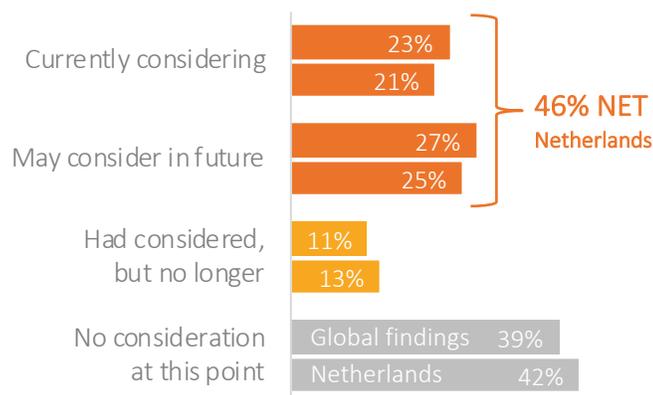
A slightly higher number of girls in the 13 to 18-year-old age range hold negative perceptions when compared to boys. Relatedly, fewer girls report receiving encouragement from parents, teachers, peers, or others to consider a career in technology. These, and other factors, inevitably contribute to lower rates of consideration for a career in technology. Given the pressing need to expand the pipeline to meet current and longer-term tech talent labor shortages, it's imperative that employers, educators, policy-makers, and organizations such as CompTIA continue to work to address these challenges.

ADDRESSING THE ENCOURAGEMENT GAP

40% vs. 28%

According to the Netherlands data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. A little less than half (45%) of young people in the Netherlands report knowing someone personally who works in the tech field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter. More boys than girls feel that the lack of exposure to technology or preparation in high school and the lack of tech job opportunities in their local area are barriers. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the 'confidence gap' is a perception shared by a little less than half the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Lack of preparation / exposure to tech in school
2. Tech too competitive / too difficult to enter
3. Cost / lack of affordable schooling / training options
4. Challenge of balancing schooling / training with work and life
5. Lack of mentors / guidance in how to pursue a career in tech

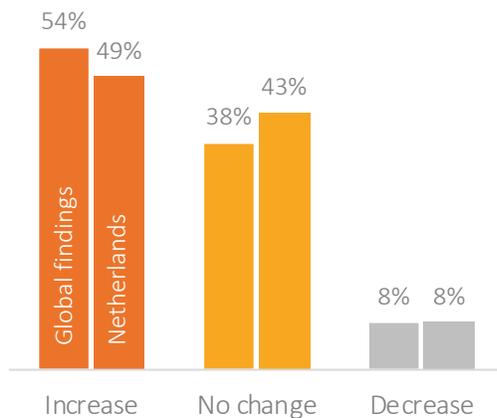
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, half of young people in the Netherlands expect technology to further shape their personal and work lives.

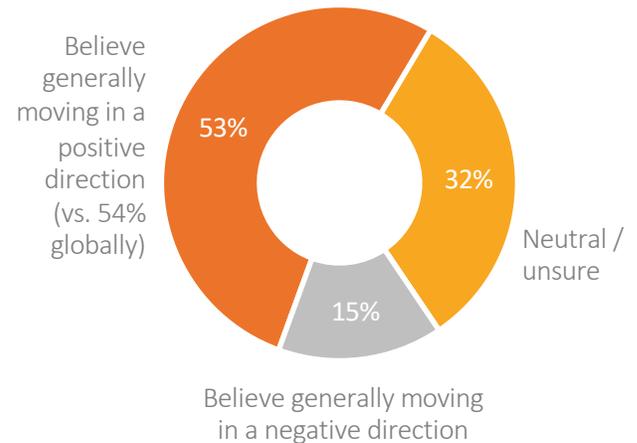
A slightly greater proportion of teenagers in the emerging economies covered by this study believe their reliance on technology will increase.

This CompTIA study finds that 9 out of 10 teenagers connect to the internet on their mobile phones, a confirmation of the “anywhere, anytime” approach to technology. According to Marketing Resources Incorporated, mobile app [usage](#) across all users in the Netherlands is topped by communications, and then gaming, and business/finance apps.

Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people in the Netherlands generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 63% believing it is moving in a positive direction compared to 43% of girls. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concern with the future direction of technology is the impact on privacy and control over personal data. Other factors playing into the negative perception are cyberbullying, apps becoming too much of a distraction (more of a concern among teenage girls when compared to teenage boys), and too much commercialization. More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Tech consistently faster, better, more features
2. More choices / more user needs met
3. Innovation / the next big breakthrough could drastically improve lives
4. Narrowing digital divide / expanding access to information, services, etc.
5. Free or “freemium” access to apps and services

FUTURE OF WORK

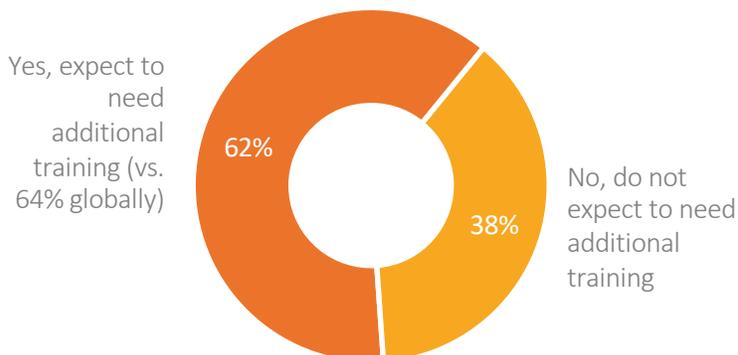
While technology-induced change to the workforce has been a facet of life since the industrial revolution, recent advances in artificial intelligence and automating technologies have raised new questions – and new concerns.

These discussions are not lost on young people in the Netherlands. Six in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. About a third note feeling that their jobs will not be replaced by the technologies of the future. While concerns about future jobs are high, the majority of teenagers are not personally aware of someone who has lost a job as a result of automation.

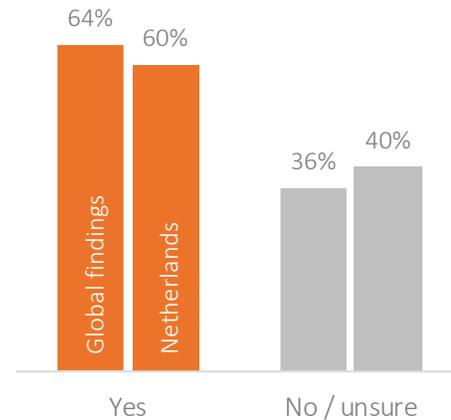
A [report](#) from the consultancy McKinsey & Company about automation and the future of the workforce details the skills shifts that automation and AI technologies are likely to bring – primarily skills associated with structured, repetitive tasks in the short-term. Offsetting the diminishing need for skills that could potentially be automated is the growth in high skill areas. The study anticipates that the need for advanced IT/programming skills could grow as much as 90% between 2016 and 2030. It also notes the need to develop foundational digital skills for the jobs of the future where just about every worker is a technologist on some level.

According to CompTIA's research, the majority of young people in the Netherlands astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

Impact of automation on additional tech training



Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Influences generating interest in tech careers

1. Personal use of technology / hobby and
2. Technology class in school
3. Parent, sibling, teacher, friend, etc.
4. Technology club / organization in school
5. School sponsored work program / apprenticeship in technology

SOUTH AFRICA INTRODUCTION

Technology plays a pivotal role in the lives of South Africa's 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among South Africa's young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in South Africa are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



5.1 million

Number of lower and upper secondary students in South Africa
Source: UNESCO | 2017 estimate

\$29.5 billion

Spending on technology in South Africa; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

6 in 10

% currently considering or may consider in the future a career in technology

77%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 39% via computer

68%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in South Africa are thinking about their career options and a majority (61%) have some idea of the path they would like to pursue. A career in some aspect of technology is something more than half (57%) are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, designing apps for smartphones, running a tech business, and using technology to solve problems in healthcare, education were popular among teenagers.

An analysis of what South African teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not it is a mischaracterization.

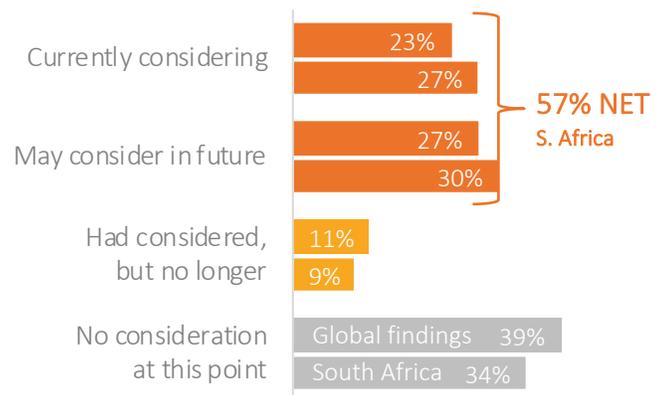
A slightly higher number of girls in the 13 to 18-year-old age range hold negative perceptions when compared to boys. Relatedly, fewer girls report receiving encouragement from parents, teachers, peers, or others to consider a career in technology. These, and other factors, inevitably contribute to lower rates of consideration for a career in technology. Given the pressing need to expand the pipeline to meet current and longer-term tech talent labor shortages, it's imperative that employers, educators, policy-makers, and organizations such as CompTIA continue to work to address these challenges.

ADDRESSING THE ENCOURAGEMENT GAP

68% vs. 45%

According to the South Africa data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. Less than half of young people in South Africa report knowing someone personally who works in the tech field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter. The primary perceived barriers in South Africa are the lack of tech job opportunities in the local area and the lack of affordable training options. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the 'confidence gap' is a perception shared by a majority of the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Limited tech job opportunities in my local area
2. Cost / lack of affordable schooling / training options
3. Tech too competitive / too difficult to enter
4. Lack of preparation / exposure to tech in school
5. Lack of mentors / guidance in how to pursue a career in tech

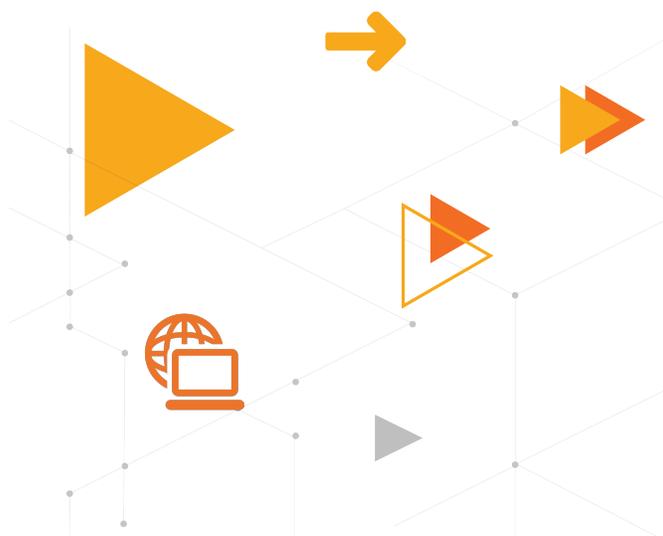
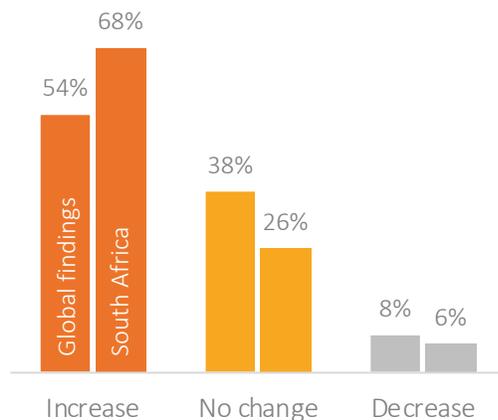
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, more than half of young people in South Africa expect technology to further shape their personal and work lives.

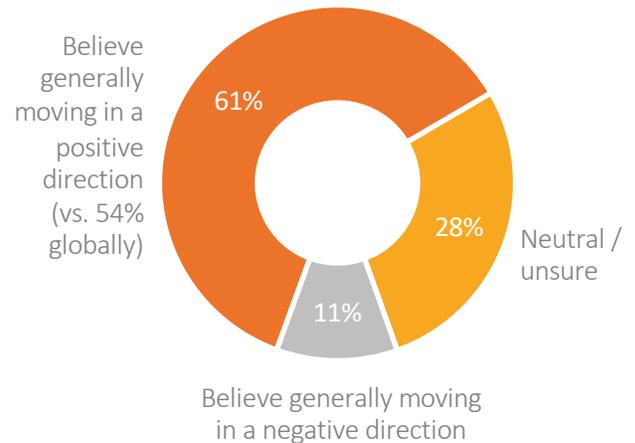
A slightly greater proportion of teenagers in the emerging economies covered by this study believe their reliance on technology will increase.

This CompTIA study finds that 8 out of 10 teenagers connect to the internet on their mobile phones, a confirmation of the “anywhere, anytime” approach to technology. According to Marketing Resources Incorporated, mobile app [usage](#) across all users in South Africa is topped by communications, and then music/entertainment, and social apps.

Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people in South Africa generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 72% believing it is moving in a positive direction compared to 51% of girls. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concern with the future direction of technology is the impact on privacy and control over personal data. Other factors playing into the negative perception are cyberbullying (more of a concern among teenage girls when compared to teenage boys), apps being too much of a distraction, and growing cybersecurity risks. More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Tech consistently faster, better, more features
2. Innovation / next breakthrough could further improve lives
3. More choices / more user needs met
4. Narrowing digital divide / expanding access to information, services, etc.
5. Free or “freemium” access to apps and services

FUTURE OF WORK

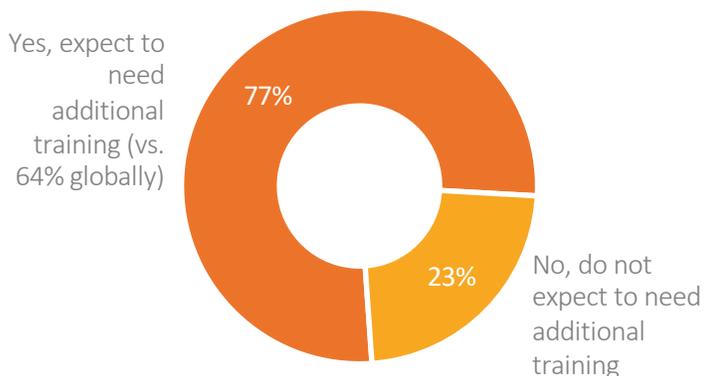
While technology-induced change to the workforce has been a facet of life since the industrial revolution, recent advances in artificial intelligence and automating technologies have raised new questions – and new concerns.

These discussions are not lost on young people in South Africa. Nearly 7 in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. Less than 1 in 5 note feeling that their jobs will not be replaced by the technologies of the future. While concerns about future jobs are high, the majority of teenagers are not personally aware of someone who has lost a job as a result of automation.

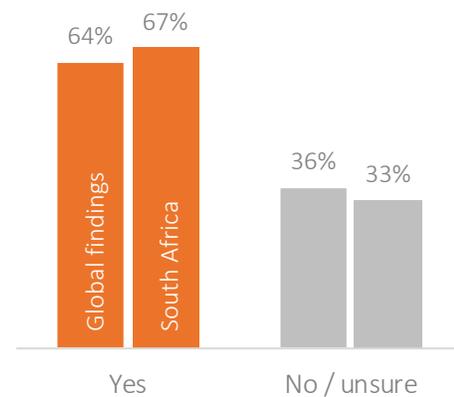
A [report](#) from the consultancy McKinsey & Company about automation and the future of the workforce details the skills shifts that automation and AI technologies are likely to bring – primarily skills associated with structured, repetitive tasks in the short-term. Offsetting the diminishing need for skills that could potentially be automated is the growth in high skill areas. The study anticipates that the need for advanced IT/programming skills could grow as much as 90% between 2016 and 2030. It also notes the need to develop foundational digital skills for the jobs of the future where just about every worker is a technologist on some level.

According to CompTIA's research, the majority of young people in South Africa astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

Impact of automation on additional tech training



Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Influences generating interest in tech careers

1. Personal use of technology / hobby
2. School-sponsored work program / apprenticeship in technology
3. Parent, sibling, teacher, friend, etc.
4. Technology class in school
5. Non-school related work program

SAUDI ARABIA, UAE INTRODUCTION

Technology plays a pivotal role in the lives of Saudi Arabia's and the UAE's 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among Saudi Arabia's and the UAE's young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in Saudi Arabia and the UAE are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



3.9 million

Number of lower and upper secondary students in Saudi Arabia and UAE
Source: UNESCO | 2017 estimate

\$55.4 billion

Spending on technology in Saudi Arabia and UAE; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

1 in 2

% currently considering or may consider in the future a career in technology

75%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

8 in 10

% regularly accessing the internet via mobile phone vs. 49% via computer

53%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in Saudi Arabia and United Arab Emirates are thinking about their career options and a majority (56%) have some idea of the path they would like to pursue. A career in some aspect of technology is something 1 in 2 are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, designing apps for smartphones, and working in emerging technology like robotics were popular among teenagers. The data does not suggest significant differences when it comes to gender and interest in specific areas of technology.

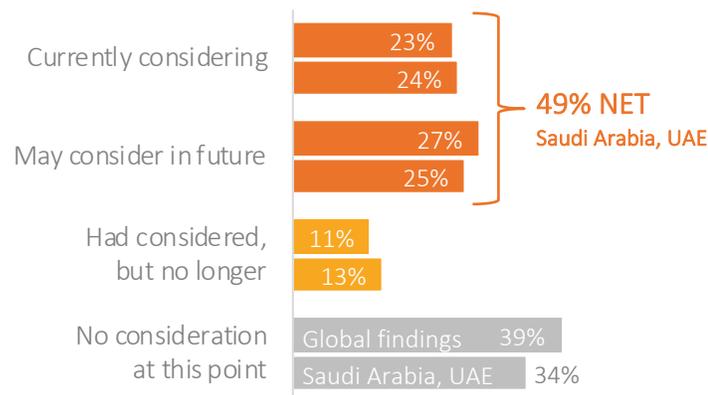
An analysis of what teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not it is a mischaracterization.

THE ENCOURAGEMENT GAP

42% vs. 39%

In Saudi Arabia and the UAE there is not much difference between teenage boys and girls when it comes to levels of encouragement to pursue a career in technology

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. Just about a third of young people in Saudi Arabia and United Arab Emirates report knowing someone personally who works in the tech field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter. A significant gender difference is seen in the matter of lack of mentors and guidance on how to pursue a career in technology – more girls than boys noted this as a challenge. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the ‘confidence gap’ is a perception shared by almost half the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Cost / lack of affordable schooling / training options
2. Lack of preparation / exposure to tech in school
3. Tech too competitive/too difficult to enter
4. Lack of mentors / guidance in how to pursue a career in tech
5. Limited tech job opportunities in my local area

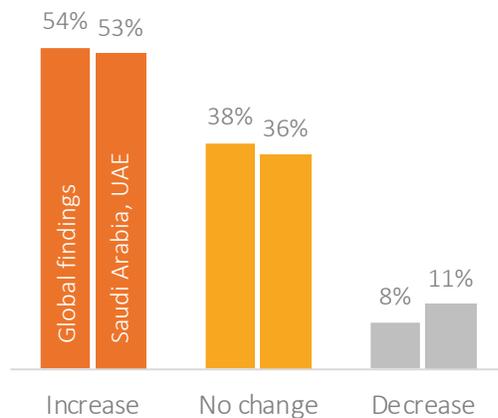
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, slightly more than half of young people in Saudi Arabia and United Arab Emirates expect technology to further shape their personal and work lives.

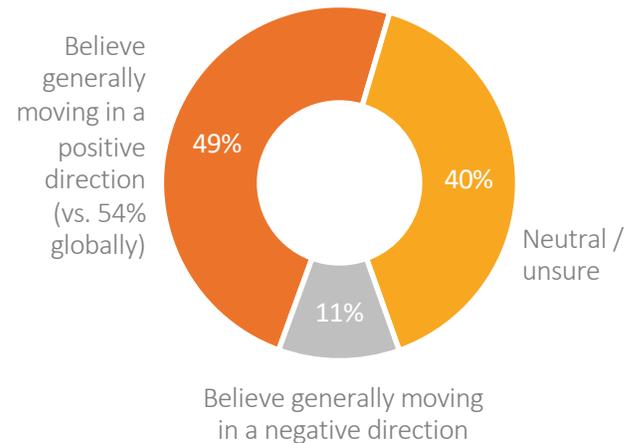
A slightly greater proportion of teenagers in the emerging economies covered by this study believe their reliance on technology will increase.

This CompTIA study finds that 8 out of 10 teenagers connect to the internet on their mobile phones, a confirmation of the “anywhere, anytime” approach to technology. According to Marketing Resources Incorporated, mobile app [usage](#) across all users in UAE (data for Saudi Arabia unavailable from this source) is topped by communications, and then shopping, social, and music/entertainment apps.

Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people in Saudi Arabia and United Arab Emirates generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 58% believing it is moving in a positive direction compared to 36% of girls. The fact that technology provides choices and has something to meet diverse needs, and the convenience that technological improvements bring drive positive perceptions.

On the flip side, the primary concern with the future direction of technology is the fact that apps and devices are becoming too much of a distraction. Another concern is the the impact on privacy and control over personal data. This concern is especially a concern among young women. Other factors playing into the negative perception are growing cybersecurity risks, and cyberbullying. More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. More choices / more user needs met
2. Tech consistently faster, better, more features
3. Free or “freemium” access to apps and services
4. Innovation / the next big breakthrough could drastically improve lives
5. Narrowing digital divide / expanding access to information, services, etc.

FUTURE OF WORK

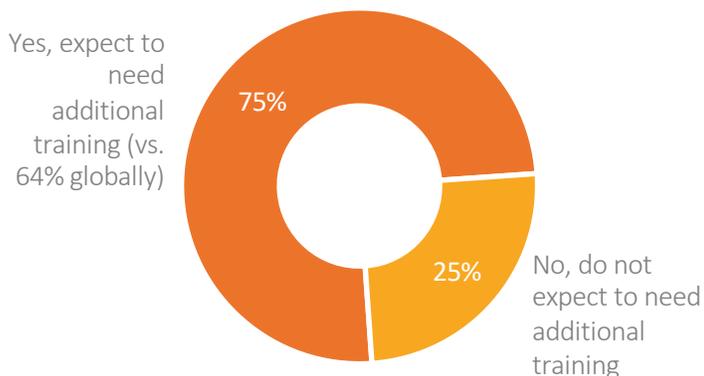
While technology-induced change to the workforce has been a facet of life since the industrial revolution, recent advances in artificial intelligence and automating technologies have raised new questions – and new concerns.

These discussions are not lost on young people in Saudi Arabia and United Arab Emirates. Five in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. A fifth note feeling that their jobs will not be replaced by the technologies of the future. While concerns about future jobs are high, the majority of teenagers are not personally aware of someone who has lost a job as a result of automation.

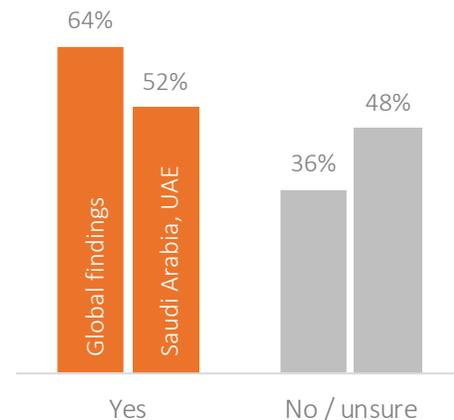
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According to CompTIA's research, the majority of young people in Saudi Arabia and United Arab Emirates astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

Impact of automation on additional tech training



Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Influences generating interest in tech careers

1. Personal use of technology / hobby
2. Technology class in school and technology club / organization in school
3. Parent, sibling, teacher, friend, etc.
4. Part-time job, gig or related with exposure to technology
5. School-sponsored work program / apprenticeship in technology

UNITED KINGDOM INTRODUCTION

Technology plays a pivotal role in the lives of the UK's 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among the UK's young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in the United Kingdom are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



6.4 million

Number of lower and upper secondary students in the United Kingdom
Source: UNESCO | 2018 estimate

\$215.6 billion

Spending on technology in the United Kingdom; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

1 in 2

% currently considering or may consider in the future a career in technology

63%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 73% via computer

57%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in the UK are thinking about their career options and a majority (60%) have some idea of the path they would like to pursue. A career in some aspect of technology is something 1 in 2 are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, designing apps for smartphones, web design, and working in emerging technology like robotics were popular among teenagers. The data suggests that certain fields, such as designing video games, resonated more with boys than girls.

An analysis of what UK teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not it is a mischaracterization.

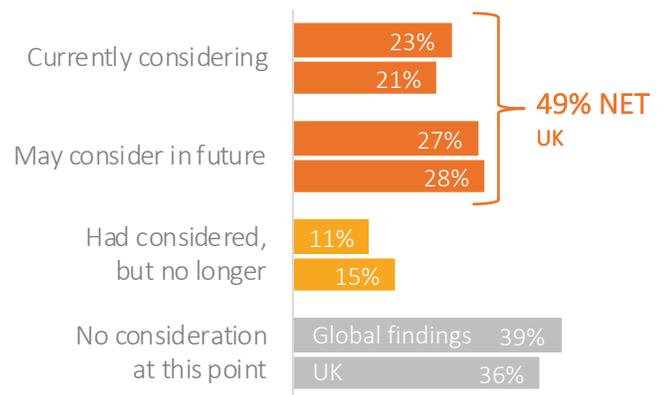
A slightly higher number of girls in the 13 to 18-year-old age range hold negative perceptions when compared to boys. Relatedly, fewer girls report receiving encouragement from parents, teachers, peers, or others to consider a career in technology. These, and other factors, inevitably contribute to lower rates of consideration for a career in technology. Given the pressing need to expand the pipeline to meet current and longer-term tech talent labor shortages, it's imperative that employers, educators, policy-makers, and organizations such as CompTIA continue to work to address these challenges.

ADDRESSING THE ENCOURAGEMENT GAP

56% vs. 44%

According to the UK data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. Just about a third of young people in the UK report knowing someone personally who works in the tech field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter. There is also the perception that there are not many tech jobs in the local area. A third also cite the lack of affordable training options as barriers to pursuing a career in technology. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the 'confidence gap' is a perception shared by majority of the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Limited tech job opportunities in my local area
2. Cost / lack of affordable schooling / training options
3. Tech too competitive/too difficult to enter
4. Lack of mentors / guidance in how to pursue a career in tech
5. Challenge of balancing schooling / training with work and life

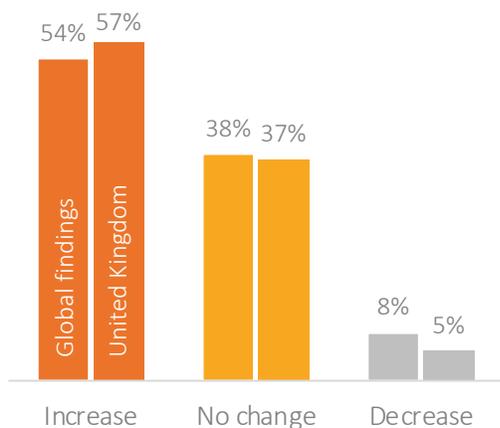
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, slightly more than half of young people in UK expect technology to further shape their personal and work lives.

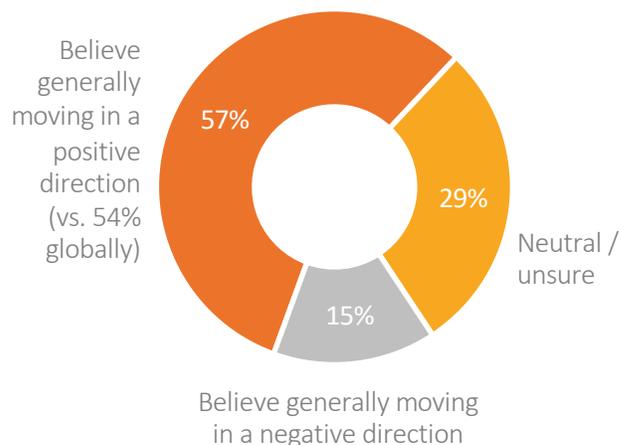
A slightly greater proportion of teenagers in the emerging economies covered by this study believe their reliance on technology will increase.

This CompTIA study finds that 9 out of 10 teenagers connect to the internet on their mobile phones, a confirmation of the “anywhere, anytime” approach to technology. According to Marketing Resources Incorporated, mobile app [usage](#) across all users in UK is topped by gaming, and then music/entertainment, and communication apps.

Technology usage and reliance expectations over next 2 years



Taking the temperature of tech perceptions



Young people in the UK generally believe that technology is a force for good and is moving in a positive direction. Teenage boys are more positive about technology with 65% believing it is moving in a positive direction compared to 48% of girls. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concern with the future direction of technology is the impact on privacy and control over personal data. This concern is especially a concern among young women. Other factors playing into the negative perception are cyberbullying, apps being too much of a distraction, and growing cybersecurity risks. More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Tech consistently faster, better, more features
2. Innovation / next breakthrough could further improve lives and
3. More choices / more user needs met
4. Narrowing of the digital divide / expanding access to information, services, etc.
5. Free or “freemium” access to apps and services

FUTURE OF WORK

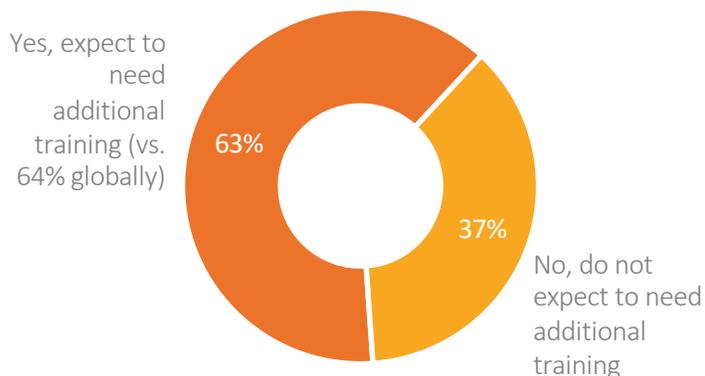
While technology-induced change to the workforce has been a facet of life since the industrial revolution, recent advances in artificial intelligence and automating technologies have raised new questions – and new concerns.

These discussions are not lost on young people in the UK. Seven in 10 teens report hearing about the automation trend and a majority are concerned that it might mean fewer jobs for them in the future. About 1 in 5 note feeling that their jobs will not be replaced by the technologies of the future. While concerns about future jobs are high, the majority of teenagers are not personally aware of someone who has lost a job as a result of automation.

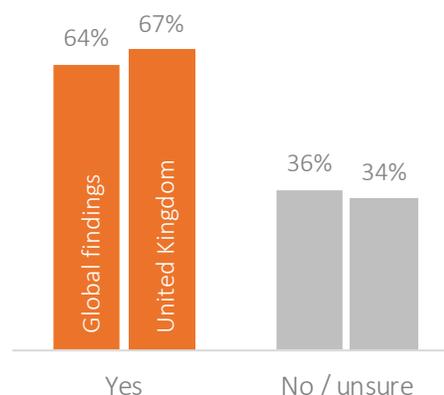
A [report](#) from the consultancy McKinsey & Company about automation and the future of the workforce details the skills shifts that automation and AI technologies are likely to bring – primarily skills associated with structured, repetitive tasks in the short-term. Offsetting the diminishing need for skills that could potentially be automated is the growth in high skill areas. The study anticipates that the need for advanced IT/programming skills could grow as much as 90% between 2016 and 2030. It also notes the need to develop foundational digital skills for the jobs of the future where just about every worker is a technologist on some level.

According to CompTIA's research, the majority of young people in the UK astutely anticipate the need for additional training and hands-on experience in various technology disciplines to ensure they are well positioned in the workplace of tomorrow.

Impact of automation on additional tech training



Familiarity with stories about automating technologies and workforce impact



While considering potential avenues for training, it must be noted that young people gain interest in technology by experiencing it themselves or through interactions with parents, teachers, peers, or others.

Previous research from CompTIA underscores that teens look for first-hand experience and tend to look to people in their close circle, family or people who they know that work in the field as reliable sources of information. As expected, exposure to technology via school classes or programs plays an equally vital role. Classroom programs and teachers equipped to teach the latest in technology, however, can vary greatly from school to school across countries and within countries. This can be characterized as a type of digital divide that poses another challenge to expanding and diversifying the pipeline of tech talent.

Influences generating interest in tech careers

1. Personal use of technology / hobby
2. Technology class in school
3. Parent, sibling, teacher, friend, etc.
4. School sponsored work program / apprenticeship in technology and
5. Non-school related work program / apprenticeship in technology

UNITED STATES INTRODUCTION

Technology plays a pivotal role in the lives of US 13 to 18-year-olds and they expect their reliance and usage of technology to increase over the next two years. Most teenagers believe technology is generally moving in a positive direction and is a force for good. Their primary concerns are privacy, online civility, and cybersecurity when it comes to the potential negative impacts of technology.

The latest research from CompTIA reveals a healthy interest in information technology (IT) careers among US young people. The interest is encouraging, but could it be even higher? Perceptions of careers in technology are largely positive – among both girls and boys, but information gaps undoubtedly play a role in discouraging segments of students from pursuing a career in technology.

Given its prevalence in the news, young people in the United States are quite familiar with trends relating to automating technologies and the potential impact on future jobs. While there is some level of concern, most young people see it as another reason to further develop their skills and experience with technology.



24.8 million

Number of lower and upper secondary students in the United States
Source: UNESCO | 2017 estimate

\$1.6 trillion

Spending on technology in the United States; inclusive of hardware, software, services, telecom, and emerging tech.
Source: IDC | 2019 estimate USD

1 in 2

% currently considering or may consider in the future a career in technology

64%

NET % expecting to need even more training in technology due to the likely impact of automating technologies

9 in 10

% regularly accessing the internet via mobile phone vs. 63% via computer

48%

% expecting their usage and reliance on technology will increase over the next 2 years

CAREERS IN TECHNOLOGY: PERCEPTIONS OF OPPORTUNITIES AND CHALLENGES

Most young people in the US are thinking about their career options and a majority (63%) have some idea of the path they would like to pursue. A career in some aspect of technology is something 1 in 2 are considering or may consider in the future. This could be viewed as a positive number, although it does mean a significant number of young people have formed an opinion that technology careers are not for them, which may reflect real or perceived barriers or misconceptions (see table at lower right).

When asked about interest in specific areas of technology, designing video games, designing apps for smartphones, web design, and working in emerging technology areas like robotics were popular among teenagers. The data suggests that certain fields, such as running a technology business, resonated more with boys than girls.

An analysis of what US teenagers think about a job in technology reflect largely positive, and a couple of secondary negative perceptions. Chief among the positives is the way technology can be used to solve problems, being fun, interesting work, and paying well. On the flip side, there is the perception that good math and science skills are a pre-requisite for jobs in IT and that it is difficult, complicated work. While true of some fields, more often than not it is a mischaracterization.

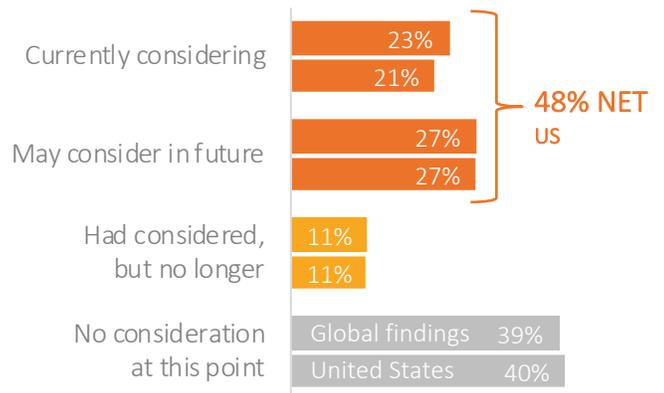
A slightly higher number of girls in the 13 to 18-year-old age range hold negative perceptions when compared to boys. Relatedly, fewer girls report receiving encouragement from parents, teachers, peers, or others to consider a career in technology. These, and other factors, inevitably contribute to lower rates of consideration for a career in technology. Given the pressing need to expand the pipeline to meet current and longer-term tech talent labor shortages, it's imperative that employers, educators, policy-makers, and organizations such as CompTIA continue to work to address these challenges.

ADDRESSING THE ENCOURAGEMENT GAP

64% vs. 47%

According to the US data, teenage boys receive notably higher levels of encouragement to consider a career in technology compared to teenage girls.

Consideration for pursuing a career in technology



One important factor in shaping career decisions is exposure to the field. Only a little more than a third of young people in the US report knowing someone personally who works in the tech field. More boys than girls report knowing of more people who work in a technology field. Consequently, many young people are possibly missing out on firsthand career insights.

This lack of information also leads to the general perception that the IT field is difficult to enter. There is also the perception that the lack of affordable training options is a barrier to pursuing a career in technology. The other top perceived barriers are noted below and are largely consistent across gender.

The perception that careers in the tech field are not accessible/that there are barriers i.e. the 'confidence gap' is a perception shared by half the teenagers surveyed. The factors that discourage a career in technology mirror the barriers faced with a fear of failure and not having the requisite skills topping the list.

Top perceived barriers to pursuing a career in technology

1. Cost / lack of affordable schooling / training options
2. Lack of preparation / exposure to tech in school
3. Tech too competitive / too difficult to enter
4. Lack of mentors / guidance in how to pursue a career in tech
5. Limited tech job opportunities in my local area

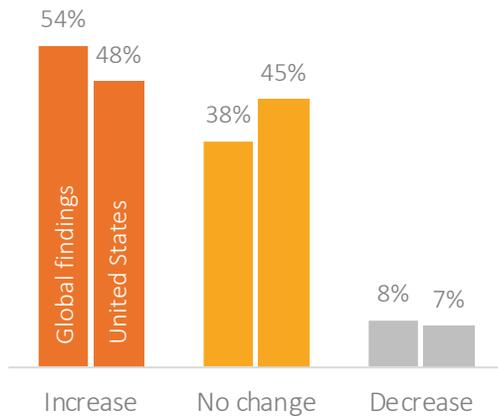
TECHNOLOGY MOVING IN THE RIGHT DIRECTION?

Technology is undoubtedly interwoven into the lives of 13 to 18-year-olds today, with labels such as ‘digital native’ driving this point home. Even with the already high utilization of technology, half of young people in the US expect technology to further shape their personal and work lives.

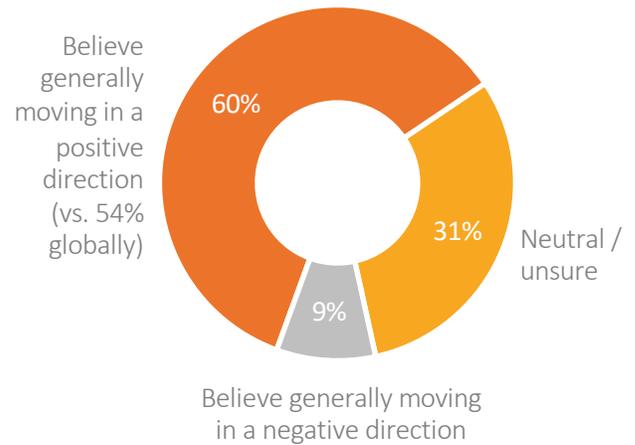
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Young people in the US generally believe that technology is a force for good and is moving in a positive direction. The positive impact of innovation, the convenience technological improvements bring, and the potential to improve lives drive positive perceptions.

On the flip side, the primary concern with the future direction of technology is the impact on privacy and control over personal data. This concern is especially a concern among young women. Other factors playing into the negative perception are cyberbullying, apps being too much of a distraction, and growing cybersecurity risks (concerns relating to cybersecurity and distracting apps are more pronounced among teenage girls when compared to boys). More details on these concerns are available in the Appendix.

Top factors contributing to positive views of technology

1. Innovation / next breakthrough could further improve lives
2. Tech consistently faster, better, more features
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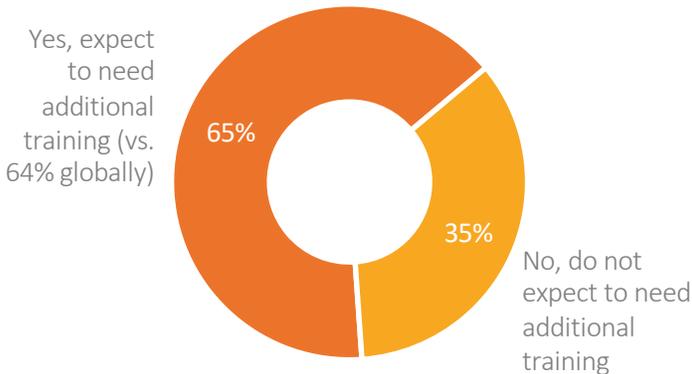
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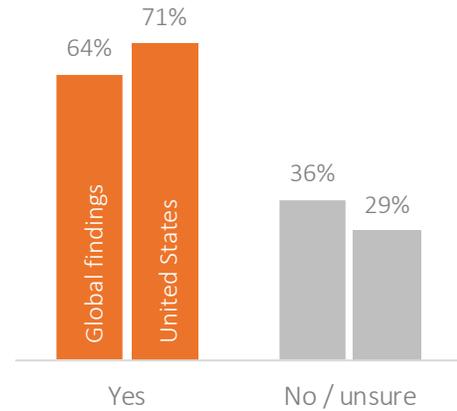
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Familiarity with stories about automating technologies and workforce impact



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2. Technology class in school
3. Parent, sibling, teacher, friend, etc.
4. Technology club / organization in school and
5. School sponsored work program / apprenticeship in technology

METHODOLOGY | ABOUT COMPTIA | APPENDIX

ABOUT THIS RESEARCH

CompTIA's *International Youth Perspectives of Technology and Careers* study explores what young people (ages 13-18 years) think about a range of issues involving technology, their careers, and the future of work.

The quantitative study consisted of an online survey fielded to 13 to 18-year-old respondents during August 2019. A total of 1,508 respondents participated in the survey, yielding an overall margin of sampling error at 95% confidence of +/- 2.6 percentage points. This survey was fielded in Australia, Brazil, Canada, India, Japan, Netherlands, Saudi Arabia, United Arab Emirates, South Africa, United Kingdom, and United States. Sampling error is larger for subgroups of the data. Prior year surveys had similar sample sizes and margins of error.

As with any survey, sampling error is only one source of possible error. While non-sampling error cannot be accurately calculated, precautionary steps were taken in all phases of the survey design, collection and processing of the data to minimize its influence.

Additional data sources used in this report include: IDC, UNESCO, McKinsey & Company, and various other CompTIA research studies. See the complementary *CompTIA International Trends in Technology and Workforce* study on the state of international business adoption of technology, trends, and workforce issues.

CompTIA is responsible for all content and analysis. Any questions regarding the study should be directed to CompTIA Research and Market Intelligence staff at research@comptia.org.

CompTIA is a member of the market research industry's Insights Association and adheres to its internationally respected Code of Ethics and Standards.

ABOUT COMPTIA

The Computing Technology Industry Association (CompTIA) is a leading voice and advocate for the \$5 trillion global information technology ecosystem; and the more than 50 million industry and tech professionals who design, implement, manage, and safeguard the technology that powers the world's economy.

Through education, training, certifications, advocacy, philanthropy, and market research, CompTIA is the hub for advancing the tech industry and its workforce.



APPENDIX

Youth Opinions of Where Technology is Headed

	Australia	Brazil	Canada	India	Japan	Middle East*	Netherlands	South Africa	United Kingdom	United States
Generally think technology is moving in a positive direction	54%	54%	49%	58%	45%	49%	53%	61%	57%	60%
Neutral / unsure	33%	38%	39%	34%	46%	40%	32%	28%	29%	31%
Generally think technology is moving in a negative direction	13%	8%	12%	8%	9%	11%	15%	11%	15%	9%

*Middle East region includes responses from Saudi Arabia and United Arab Emirates

CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Youth Opinion of Why Technology is Moving in a Positive Direction

	Australia	Brazil	Canada	India	Japan	Middle East*	Netherlands	South Africa	United Kingdom	United States
Apps and devices that get faster, better, and with more features	45%	49%	49%	47%	45%	42%	51%	45%	59%	61%
More choices / something to meet the needs of just about everyone	57%	38%	46%	37%	43%	43%	46%	37%	51%	60%
Innovation / the next big breakthrough could drastically improve lives	63%	40%	57%	31%	32%	36%	37%	43%	51%	67%
Narrowing digital divide / expanding access to information, services, etc.	41%	27%	37%	27%	24%	28%	35%	27%	31%	37%
Free or "freemium" access to many apps and services	27%	39%	25%	31%	25%	37%	33%	17%	25%	37%

*Middle East region includes responses from Saudi Arabia and United Arab Emirates

CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Youth Opinion of Why Technology is Moving in a Negative Direction

	Australia	Brazil	Canada	India	Japan	Middle East*	Netherlands	South Africa	United Kingdom	United States
Lack of privacy / control over personal data	67%	46%	63%	41%	54%	40%	50%	53%	67%	67%
Lack of civility online / cyberbullying	47%	45%	49%	34%	59%	38%	43%	38%	52%	53%
Growing cybersecurity risks	58%	35%	47%	43%	35%	38%	39%	39%	55%	53%
Apps and devices becoming too much of a distraction / too addictive	51%	33%	51%	45%	32%	43%	43%	43%	45%	54%
Too much advertising / commercialization	37%	23%	41%	25%	33%	34%	43%	27%	37%	35%
Growing digital divide / some have access to technology and some do not	23%	29%	22%	13%	16%	22%	15%	21%	15%	17%

*Middle East region includes responses from Saudi Arabia and United Arab Emirates

CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Youth Consideration for a Career in Technology

	Australia	Brazil	Canada	India	Japan	Middle East*	Netherlands	South Africa	United Kingdom	United States
Currently considering technology as a career option	26%	34%	32%	41%	9%	36%	30%	39%	25%	27%
Had considered, but no longer	30%	20%	30%	20%	37%	23%	20%	21%	35%	36%
May consider in the future	28%	31%	25%	19%	25%	27%	33%	27%	31%	26%
No current or future consideration at this point	16%	15%	13%	20%	29%	15%	17%	12%	9%	11%
Not sure	12%	11%	17%	29%	23%	20%	13%	18%	9%	13%

*Middle East region includes responses from Saudi Arabia and United Arab Emirates

CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Youth Consideration for a Career in Technology

	Male	Female	Age 13-15	Age 16-18	Live in Large City	Live in Medium City	Live in Small City
Currently considering technology as a career option	32%	13%	21%	25%	26%	20%	22%
Had considered, but no longer	11%	10%	9%	13%	12%	10%	9%
May consider in the future	27%	28%	28%	26%	28%	31%	24%
No current or future consideration at this point	14%	31%	22%	23%	21%	22%	25%
Not sure	16%	17%	20%	13%	13%	17%	20%

*Middle East region includes responses from Saudi Arabia and United Arab Emirates

CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Youth Interest in Specific Fields of Technology

	Male	Female	Age 13-15	Age 16-18	Live in Large City	Live in Medium City	Live in Small City
Designing video games	37%	21%	30%	29%	32%	26%	28%
Designing apps for mobile phones	25%	25%	23%	27%	29%	24%	22%
Designing web pages	21%	25%	22%	24%	23%	24%	22%
Working in emerging tech (i.e. AI, robotics)	24%	15%	20%	19%	23%	18%	17%
Applying technology to solve problems in healthcare, education, environment, etc.	19%	20%	18%	21%	22%	19%	16%
Running my own technology business	24%	10%	17%	17%	21%	16%	13%
Working in cybersecurity	21%	13%	16%	18%	19%	15%	16%
Working to help others use technology	18%	12%	15%	16%	18%	12%	14%
Working with data / data scientist	15%	13%	12%	15%	16%	11%	13%
None of these	23%	35%	32%	26%	25%	31%	33%

*Middle East region includes responses from Saudi Arabia and United Arab Emirates

CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Incidence of Receiving Encouragement to Pursue a Career in Technology

	Australia	Brazil	Canada	India	Japan	Middle East*	Netherlands	South Africa	United Kingdom	United States
Yes	44%	47%	43%	58%	25%	41%	34%	57%	50%	55%
No	44%	41%	39%	24%	43%	37%	41%	33%	38%	39%
Not sure	12%	12%	18%	18%	31%	22%	25%	10%	12%	6%

*Middle East region includes responses from Saudi Arabia and United Arab Emirates

CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Youth Perceptions of Challenges to Pursuing a Career in Technology

	Australia	Brazil	Canada	India	Japan	Middle East*	Netherlands	South Africa	United Kingdom	United States
Field of technology is too competitive / too difficult to enter	26%	34%	37%	34%	23%	25%	21%	29%	31%	31%
Cost / lack of affordable schooling / training options	27%	27%	35%	28%	23%	30%	19%	31%	35%	35%
Lack of preparation / exposure to technology in high school or college	35%	25%	29%	21%	30%	27%	24%	26%	17%	33%
Limited job opportunities in technology in my local area	35%	20%	24%	26%	15%	19%	17%	32%	40%	24%
Lack of mentors / guidance in how to pursue a career in technology	27%	23%	26%	21%	18%	23%	17%	25%	25%	29%
Challenge of balancing schooling / training with work and life	29%	22%	22%	12%	9%	17%	18%	21%	21%	23%

*Middle East region includes responses from Saudi Arabia and United Arab Emirates

CompTIA

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APPENDIX

Youth Perceptions of Challenges to Pursuing a Career in Technology

	Male	Female	Age 13-15	Age 16-18	Live in Large City	Live in Medium City	Live in Small City
Field of technology is too competitive / too difficult to enter	31%	28%	27%	31%	32%	28%	26%
Cost / lack of affordable schooling / training options	30%	28%	27%	31%	33%	27%	25%
Lack of preparation / exposure to technology in high school or college	29%	24%	24%	29%	30%	23%	25%
Limited job opportunities in technology in my local area	27%	23%	24%	26%	24%	25%	26%
Lack of mentors / guidance in how to pursue a career in technology	23%	23%	22%	24%	26%	23%	21%
Challenge of balancing schooling / training with work and life	19%	20%	17%	21%	20%	19%	19%

*Middle East region includes responses from Saudi Arabia and United Arab Emirates

CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Perceptions of Confidence Gap as a Factor in Discouraging Pursuit of a Career in Technology

	Australia	Brazil	Canada	India	Japan	Middle East*	Netherlands	South Africa	United Kingdom	United States
Definitely a factor in pursuing a tech career	19%	27%	16%	23%	9%	23%	12%	19%	17%	19%
Probably a factor	27%	23%	39%	23%	35%	26%	28%	33%	35%	32%
May or may not be a factor	35%	31%	29%	30%	40%	22%	33%	27%	32%	31%
Probably not a factor	8%	5%	7%	9%	5%	16%	13%	11%	11%	9%
Definitely not a factor in pursuing a tech career	11%	13%	9%	15%	11%	13%	13%	11%	5%	10%

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CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Specific Facets of Confidence Gap Discouraging Pursuit of a Career in Technology

	Australia	Brazil	Canada	India	Japan	Middle East*	Netherlands	South Africa	United Kingdom	United States
Fear of failure / starting something and not being able to finish it	45%	42%	37%	28%	21%	30%	24%	36%	45%	51%
Concern over lacking certain skills, such as math or science	45%	34%	33%	23%	22%	32%	32%	27%	42%	43%
Fear of starting too far behind others / not being able to catch up	35%	39%	31%	20%	22%	20%	31%	25%	36%	40%
Fear of the unknown	32%	27%	33%	25%	25%	22%	17%	39%	29%	30%
Concern over working in technology without a 4-year college degree	33%	21%	26%	20%	20%	21%	23%	14%	29%	22%
Concern over the negative stereotypes of "tech culture"	25%	19%	24%	15%	7%	24%	20%	13%	25%	22%

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CompTIA

Source: CompTIA's International Youth Perspectives of Technology and Careers

Youth Awareness and Concern Over Possible Job Displacement Due to Automating Technologies

Incidence of seeing/hearing reports	Male	Female	Age 13-15	Age 16-18	Live in Large City	Live in Medium City	Live in Small City
Yes	64%	64%	61%	66%	66%	66%	60%
No	20%	20%	20%	20%	20%	18%	22%
Not sure	16%	16%	19%	14%	14%	17%	18%

Level of concern	Male	Female	Age 13-15	Age 16-18	Live in Large City	Live in Medium City	Live in Small City
Very concerned	24%	23%	25%	22%	25%	23%	21%
Somewhat concerned	40%	43%	40%	43%	42%	41%	41%
Not that concerned	20%	15%	16%	19%	17%	17%	18%
Not sure	16%	19%	19%	16%	15%	18%	20%

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