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By Rachel Baruch[1]

Abstract

Researchers and scholars consider the Internet today to be the most far-reaching technological tool, in regards to its implications for our present-day society. Its development and usage has, among other things, implications for gender perceptions, as well as for education and studies. The main purpose of the study was to examine attitudes held by female education students toward information technology in general and studying within an Internet-environment in particular, as well as the way they perceive themselves in such a changing world.

20 interviews with students of education were analyzed during the course of this study. Results of the study indicate that the interviewed students perceive this world (Internet and technology) as a part of their lives. They see the Internet as an efficient and necessary tool. It seems, however, that the women do not view the Internet as an object over which they have control or have control over its development. In addition, a positive approach toward learning through the Internet was found and the students noted the importance of information technology's contribution to learning.

Key Words: E-learning, Gender, Technology, Higher Education

Introduction

Information technologies, and the Internet in particular, have created a new area for social studies. The Internet is a social space which raises questions about the essence of gender and in which gender-based characteristics are expressed.

The Internet influences human activity, as well as social-emotional and educational changes. The link between these is expressed in the two qualities of the Internet: a means of communication and a center of information.

Technology is perceived as a world in which a prominent gender gap exists. This gap in common perceptions is a product of various elements, including accessibility, resources and leisure, but to an extent it is also a product of men's and women's approaches to technology. This issue is expressed in the field of education. Bates (1999) asserts that the new forms of media change the form and nature of human knowledge, and that such changes inevitably lead to comprehensive changes to the teaching profession. The effects of these developments are mainly

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visible in fields of higher education (Bates, 1997, 1999; Fetterman, 1998; Fox, 1999; Schifter, 2000).

The gender gap in computer usage begins as early as in childhood, emphasized within the family setting, and persists throughout adolescence. Technology and computer skills constitute a substantial factor in the advancement and economic status of whole sectors of society. According to this approach, educators are responsible for the gender gap. They are the ones "pushing" the boys to play more mechanical and computer games, while the girls are urged to play with dolls and engage in social games. During adolescence, the self-image of girls weakens and they tend to shy away from the subjects of math, science and computers (Miller, Chaike & Groppe, 1996). Such data may affect education. Female teachers may choose to empower their male and female students and enhance their connection to the technological world. However, they can only do so when they themselves have a connection to this world and feel comfortable inside it.

This study examines the perceptions of female students of education toward information technology in general and their position within it and E-learning in particular. The hypothesis of this study is that such basic perceptions will influence their manner of teaching in the future and will have highly significant educational and social implications.

20 female students of education were interviewed during the course of the study. They were asked questions relating to their perceptions of the world of information technology, their position within it and their attitude toward it. Questions related to E-learning were also presented.

Analysis of their answers allows us to gain insights into women's lives in this day and age of high-technology and to infer initial, measured assumptions concerning the educational implications of these approaches.

Theoretical Background

Information Technology

In order to examine the relationship between human behavior and the Internet environment, we will first characterize the Internet according to its components and idiosyncrasies.

Researchers and scholars consider the Internet today to be the most far-reaching technological tool, in regards to its implications on our present-day society. Use of the Internet and its various features and it being a center for information and communication are related to social-emotional and educational processes. The Internet is referred to as "an ever-growing knowledge environment, with shortening time, extensive accessibility options, growing convenience of use and multiplying diversity. It is hailed as a symbol of acquiring knowledge and unprecedented communication. It is considered to be a tool enhancing man's ability to control his surroundings and liberating him from restrictions and influences in tracking, purchasing, accumulating, transferring and preserving information" (Shinar, 2001). Technology is an advanced "social package", consisting of both software and hardware, but also values, traditions, positions and behavioral patterns.

The development and usage of the Internet are both intertwined with a comprehensive change that is mostly concerned with the ways in which people communicate, refer to each other and observe resources and ideas. The integration of the Internet in human life has various social implications, among which are:

- The dynamic nature of the Internet as a phenomenon that is in interaction with its environment and altering it.
- The social meaning of the Internet, creating and modifying norms, both in its own usage and beyond it in social and other organizations (Shinar, 2001; Postman, 1998).

Internet Influences on Human Activity, Social-Emotional and Educational Changes

The connection is expressed in the two qualities of the Internet:

- As a means of communication.
- As a wide and vast source of information.

In regards to the communication aspect, there is prominent influence on the social and educational interactions taking place through the Internet. The development of computer communications provides an opportunity for developing universal social relationships and extending the limited community circle to which the individual belongs. A highly influential factor in the computer-based human communication is the lack of face-to-face encounters. Computer-based communications lack those characteristics which constitute physical communication and sensual components in particular. Textual computer communication, still comprising most of the human interaction through computers, is lacking in speech tones, body language and various other visible and vocal means. Even when a tool combining multimedia exists, allowing voice, video and such, a complete sense of face-to-face presence is still missing. In such situations of Internet learning, the subject of interaction between participants was found to be a significant component related to the level of motivation, achievements and positive approaches of the participants to this type of learning (Cohen, 1999; Wegerif, 1998; Perrole, 1999; Moore, 1999; Hughes & Hewson, 1998). Communication through the Internet is therefore characterized by the components that distinguish it from physical communication.

In regards to the information aspect, the Internet is currently considered to be the largest source of information. Its essence as a center of resources intricately connected without order or a master organization has implications on the processes of knowledge construction taking place within it. Understanding the nature of the Internet as an information source and its usage by man is crucial for the understanding of educational processes taking place in an Internet-based learning environment. Seely- Brown & Duguid (2000) raise the issue of society's approach to the subject of information as a major social problem. If lack of information used to be the main problem in society, the subject of managing information has become a central issue today. Although there is no lack in knowledge, life has not become simpler thanks to these amounts of data. Seely-Brown and Duguid join a long line of researchers and theoreticians who view the main problem as being the usage and planning of the technology, rather than technology itself. Approaches to information, its usage and the creation of new information are all non-uniform and will take on the meaning given to them by the individual himself. This meaning relates to personality traits and preferences, and so it relates to gender-based characteristics as well. Handling and processing information organized within E-learning environments forms a part of the learning process. This handling and processing will be expressed in diverse attitudes, styles and preferences towards information. These characteristics depend on the learner and can therefore depend on gender association as well.

According to Morris and Ogen (2001), the Internet is a multi-faceted means of mass communication, meaning that it encompasses various facets of communication. Its various forms

reveal the relationship between interpersonal communication and mass communication. This is due to the Internet "playing" with characteristics of the traditional mass communication model: sender-message-recipient. They are sometimes used in traditional patterns and, at times, in entirely new combinations. The Internet communication formations can be placed along a continuum. Every point on the traditional model of the communication process may, in fact, switch from an individual to a group and into many. The messages themselves can be editorial articles created by an editor, stories created over time by many people or simple conversations. Recipients can switch freely between the positions of being a part of a crowd and spreading messages.

Bates (Bates, 1999) specifically addresses the effect of the Internet on education. He claims that the new mediums change the form and nature of human knowledge and that such changes inevitably lead to far-reaching changes in the work of the teacher. Strong influence of these developments is particularly felt in the fields of higher education (Bates, 1997, 1999; Fetterman, 1998; Fox, 1999; Schifter, 2000).

Bates lists a number of characteristics of the development of the Internet, multimedia and in between the two:

- The option of distance learning gives rise to new goals for studies and education between distant geographical destinations.
- The use of multimedia contributes to the development of intellectual skills, as well as others skills, such as problem solving and decision making.
- The Internet technology serves to advance the field of knowledge management and cooperative learning skills.
- The Internet allows for development of multi-cultural courses and global programs.

In recent years, with the introduction of the broadband Internet and the growth of new technologies, the Internet has transformed itself, moving on to the "next generation", popularly known as WEB 2.0 (O'Reilly, 2005). New development technologies and perceptions of Internet usage created opportunities and changes in accessibility. The development technologies allowed the creation of custom websites. Internet users no longer settle for "knowledge absorption" on websites, but "take the reins" into their own hands. The key word of the new concept is "sharing"—sharing information between websites and between users, with the possibility of creating integrated information. The Internet is turning into a base for creating knowledge, rather than an application alone. WEB 2.0 is not only a concept; it is also a complex of new website development technologies, providing users with quick and smart applications, instead of ones requiring a long waiting period for each loaded page (O'Reilly, 2005). All these opportunities, especially sharing, are relevant for education in general and E-learning in particular.

Various courses today already include Internet tools, such as WIKI and blogs, and these allow the learners to be involved in the creation of the information. These changes raise questions relating to unique distinctions between individuals, among which are gender-based distinctions.

Gender and Information Technology

Technology is perceived as a world in which a prominent gender gap exists. This gap in common perceptions is a product of various elements, including accessibility, resources and leisure, but to an extent, it is also a product of men's and women's approaches towards

technology. These approaches are expressed in the prominent numerical difference between the number of men and women who choose technological professions as study and occupational professions. Studies carried out throughout the most recent two decades have examined differences between men's and women's functional abilities around computers. In some of the studies, this subject was examined as a part of a comprehensive question: why is the percentage of men choosing scientific and technological professions higher than the percentage of women? (Abelson et al., 1995; Camp, 1997). These studies found that women's confidence within a computer environment is lower than that of men. Some researchers attribute some of these findings to the patronizing approach of the men who took part in the examined programs (Frankel, 1990). Other researchers interpreted the differences between men's and women's abilities in computer environments as the result of the environment itself being unfitting for women (Frankel, 1990).

Gender distinctions in the accessibility and usage of technology are enhanced through the media. The media is immensely powerful in the formation of beliefs, attitudes and perceptions as early as in childhood, developing throughout life. From an early age, girls are active participants in media: watching TV, listening to the radio and music, watching videos, reading magazines, playing interactive games and so on. The accumulating effect of the media is one of the forces shaping the community. A study examining messages sent to girls through a variety of mediums (television, magazines and the like) revealed on the one hand that women are perceived as using their intelligence and decency, depending on themselves only, solving problems and achieving goals. On the other hand, much like is prominently visible in other studies, stereotypical perceptions were found in the media: the importance of physical appearance and relationships to men (Van-Zoonen, 2002). It was found that the media reinforces feminine stereotypes: the importance of external appearance and the myth of a career being more important for a man than a woman. Women tend to appear more often in the context of relationships, while men appear more in the context of careers.

The manner of men's and women's perceptions of themselves and in the eyes of the opposite sex is enhanced on the Internet, where cyberspace allows a modification of the identity. On the Internet, one's sexual identity is separated from the body and is solely based on the manner in which the individual wishes to present himself in this space. Therefore, ambiguity and the stretching of known boundaries of a gender-based identity are likely to occur (Turkle, 1995; Frohne & Christian, 2000; Van-Zoonen, 2002).

Differences in Computer Skills and E-learning

The gender gap concerning the interest in computers begins at an early age, emphasized within family settings, and continues throughout adolescence. Technology and computer skills form a significant factor in the advancement and economic status of whole sectors of society. According to this approach, educators are responsible for the gender gap. They are the ones "pushing" the boys to play more mechanical and computer games, while the girls are urged to play with dolls and engage in social games. During adolescence, the self-image of girls weakens and they tend to shy away from the subjects of math, science and computer (Miller, Chaike & Groppe, 1996). In 1994, Sakamoto (Sakamoto, 1994) reported that, among "heavy" computer users, the ratio between boys and girls is 4:1 for boys. Other studies show that men use computers and the Internet more often than women (Seybert, 2007, Jackson, Ervin, Gardner & Schmitt, 2001), and men also outnumber women regarding basic computer skills (Seybert, 2007).

Female students reported higher computer anxiety and less confidence in their computer skills (Seybert, 2007, Jackson, Ervin, Gardner & Schmitt, 2001).

Studies conducted during the past decade reveal that computer aptitude is seen as related to "manly" achievements, although women's potential is at least equal to men's in this field, and despite the rise in the number of women working in the technological field. Bimber (2000) concludes that the reason why women use the Internet less intensively than men may have to do with the stereotyping of an inherently "gendered" technology that embodies male values and content that favors men.

It was found that boys conceptualize computers differently from girls. Boys see the computer as a challenging game, while the girls view it as a tool, or a tool for carrying out tasks (Giacquinta, Bauer & Levin, 1993). The same was found among adults: male students see the computer as self-empowerment tool, while female students see it as a tool for cooperation and communication (Gerland & Martin, 2003, Kirkup & Von-Prummer, 1990).

Weiser's research (Weiser, 2004) shows that men use the Internet mainly for purposes related to entertainment and leisure, whereas women use it primarily for interpersonal communication and educational assistance. A study by Singh (2001) yields similar results regarding women's preferred usage of the Internet. Singh found that women generally use the Internet as a means for activities, rather than as an object of play or a technology that is there to be mastered.

The communicative element—seen as mostly important for women—is a main element of E-learning environments. Various studies examined differences between men and women in a computer-based environment and an E-learning environment. Most studies found differences in the perception of the environments between men and women and in the manner in which they perceive learning in an E-learning environment. Ong and Lai (Ong & Lai, 2006) examined the initial degree of acceptance of the E-learning environment. They conducted a survey comprising 67 women and 89 men working for 6 different companies. It was found that men view the computer as being beneficial and easy to use and were more willing to use it for E-learning purposes. This willingness was found to be higher than among women. It was also found that women's perceptions were more influenced by their own efficiency in computer use and the ease of using it, while men were more influenced by their perceptions of the benefits of E-learning. The authors suggest that additional researchers take gender-related factors into consideration when examining and developing E-learning theories. The authors maintain that executives and colleagues must understand the manner in which E-learning is perceived differently by men and women.

Gunn, Mcleod, McSporran and French (Gunn, Mcleod, McSporran & French, 2003) mention that the literature on the subject attributes a disadvantage to women concerning computer-based learning, due to women's relative disadvantage in their access to technology. Contrary to this approach, the researchers claim that women often display superior performance in the field of computer-supported learning when compared to men, despite the clear differences in the style of interaction. The authors state that such inequality in computer accessibility between men and women does not constitute an advantage for men, but that it is created simply due to women employing different structures and styles of interaction. Wang, Kanfer, Hinn and Arvan (Wang, Kanfer, Hinn & Arvan, 2001) state that it is common to perceive women as being more technophobic and insecure about using the computer when arriving in the university, compared with men. Their conclusion, however, is that women tend to feel insecure due to the manner of computer use in various universities.

Anderson and Haddad (Anderson & Haddad, 2005) examined 109 students who were participating in E-courses and were requested to compare E-learning with face-to- face learning. It was found that more women than men attributed more depth of knowledge to an online course than a face-to-face course.

Schumacher and Martin (Schumacher & Martin, 2001) mention the assumption that women's Internet involvement weighs on and influences their opinions concerning computers and new technologies. Studies usually support the notion of women having a less comprehensive experience around computers and tending to have a negative approach toward the computer, compared with men. Despite their limitations, studies concerned with Internet experience and the approaches to it unraveled parallel gender differences: women report lower levels of computer experience and analogously hold more negative approaches toward it. A study conducted in 2001 presented different conclusions. The researchers sought to examine whether Internet and computer experience, skills and attitudes are interlinked.

The study's conclusions are based on the reports of two groups of first-year college students, studying in the college during 1989/1990 and 1997. Significant gender differences were found in computer use and accessibility among the 1989/1990 student group. Men were found to be more experienced with computer use; they were more willing to enroll in courses including computer use, and they reported better computer skills than women when using applications such as software, games and graphics. The 1997 students were more skilled at computer use in comparison with the previous group, but gender-based differences were still found in computer experience and abilities. That year, students were more exposed to computers than the Internet, reporting higher degrees of internet use ability compared to women, aside from the use of the E-mail. The level of control and sense of convenience were generally better concerning the computer than the Internet. These two components were found to be related. Ono & Zavodny (2005) examined how the gender gap in IT in the United States and Japan evolves from gender inequality on a broader social level. The authors discovered that gender inequality in the work force and capital development is carried over to gender-based differences in IT use. However, both groups of women are generally less likely to use the Internet than their male counterparts.

A study conducted by Burret and Lally (Burrett & Lally, 1999) focused on computer communication (CMS) at a distance learning MA course. The study examined dialogues for the purpose of analyzing the emotional-social behavior in this community. The findings attest to women and men taking on different roles, especially in an E-learning environment. Insignificant differences were found in relation to the cognitive and meta-cognitive content, but behaviors and interactions were found to be different. Men sent more messages within the settings of this environment, their messages were longer, and their social contribution was bigger. However, women contributed more interactive messages than men.

The E-learning environment forces the student to engage in a communicative and personal process, during which his individual abilities, preferences, style and weaknesses are revealed. In a study, comparing the achievements of various groups in online courses, no gender-based differences were found between the "successful" and the "failing" team (Shani & Nachmias, 2001). During the course of this study, links were found between the degree of success and the learning style. The liberal student type who seeks changes and enjoys innovations benefits from the online course which brings about new challenges; he is the type of student who succeeds in this course. In addition, the more introverted student who enjoys working alone tends to find the course to be suitable for him as well. These findings partially correlate with the study conducted by Gerland and Martin (Gerland & Martin, 2003), who found

that the dominant profile of students who succeed at E-learning tends to be less focused with people and more with ideas and abstract concepts. The researchers argue that differences between men and women relate to the style of learning, and this will dictate the manner and degree of use of the various elements of the course, such as the forum, learning material and cooperative work. This review indicated that a learning style will dictate preferences, and that among women, part of the learning style is based on using communicative means with their peers and the teacher.

Price (Price, 2006) examines the matter of gender-based differences in varied contexts and inspects the trends of performance, accessibility and experience of women in online courses. Her analysis provides examples for case studies and a specific study concerning the students' academic commitment, concepts and perceptions of support and guidance while studying in E-learning environments. The analysis shows that women who participate in E-learning are confident, independent learners who can even surpass their male peers. They are not more limited than men in their approach to computers and the Internet and do not tend to participate less in online courses either. They value guidance more than men and possess communication styles that are different than men's, which may influence the course instructor's online support. The debate surrounding gender must advance beyond questions dealing with the method and the separate manners of performance of the different genders and into questions dealing with the similarity and difference in the degree of importance attributed by men and women to various interactions and online tutoring.

With the understanding of the qualities of the Internet and reviewed studies in mind, a number of questions arise. The current study will attempt to answer these questions.

Research Questions

- How do female students of education studying in an E-learning environment perceive technology in general and the information technology in particular? How do they perceive themselves and their behavior in this environment?
- How do female students of education perceive their abilities in E-learning environments, and to what extent do these perceptions represent gender characteristics?

Methodology

Interviews

The purpose of the interviews was to attempt to understand the world of the participants in its gender-based, social and technological contexts. The current study's interviews are semi-structured interviews with guiding questions. A basic question is asked at every stage of the interview, and additional clarification questions are added when necessary. The interviews were intended to reveal the perceptions and attitudes of the participants and their inner world, as far as their approach toward information technology and their position within it are concerned.

The Use of the Tool and Its Development Stages

Composing the Questions for the Interview

The interview questions were composed so as to gather as much information as possible about the world of a female student studying in an information technology-based environment in its relevant contexts. The questions related to various fields, based on theoretical and research literature.

Division of Interview Questions into Categories

Division of the interview questions into categories was determined by the researcher based on study and theoretical literature on the subject. The categories were:

- Perceptions concerning technology in general and information technology in particular.
- Approaches toward technology's benefit to learning.
- Approaches toward E-learning.

In its final edition, the interview consisted of 13 basic questions. A main question in the interview, allowing us to get an understanding of the participants' perception, was aimed at suggesting a metaphor for the Internet. The following is background information concerning the concept of the metaphor and its meaning.

The Metaphor and Its Meaning

The word 'metaphor' stems from the Greek word *metapherein* which means 'change, other'. *Pherein* means 'transferring, carrying', meaning, 'change and transference' (Brown, 1993; Gentner, 1983). Some define the metaphor as a type of image, creating an identity between two elements or traits, copied from one semantic field to another, resulting in the creation of a new verbal combination with a surprising meaning (Copperberg & Green, 2001).

Another definition: "Transference from a tangible field to an abstract field" (Lakoff & Johnson, 1980).

The metaphor can act as a tool for understanding the meaning humans attribute to reality. Man's conceptualization mechanism, which represents his understanding, carries a metaphorical nature which is often unconscious (Lakoff & Johnson, 1980). The language is saturated with an immense amount of metaphorical expressions—"Weight on my shoulders", "Climbing the social ladder", "Bursting emotions"; an argument with a war-like metaphor and therefore has "strategies, winners, losers", "rugged" types, and the known analogy between the brain and the computer, expressed in attributing it with processing, input and output descriptions.

The metaphor links two conceptual systems: "the source" and "the scope", or "the explanational concept" and "the explained concept". The metaphor is to help us conceptualize abstract concepts and facilitate discussion about them. Within this framework, the source will usually be more concrete (fathomable) than the more abstract scope.

Metaphors play a significant part in our concept system and, therefore, with our definition of reality as well. Our social reality is constructed using metaphorical terms (Levy, 1995).

Ortony (Ortony, 1975) maintains that metaphors are essential to our culture as a significant component of communication. When a difficulty arises in transferring a message from the field of experience to the verbal field, or when no words are found to describe an idea

or an image, metaphors fill this space with language; when we create a mental image based on our knowledge of the world, we are assisted by metaphors as well. These allow us to convey a message in a unique, compact manner. Due to their connection to our experiential history, using them brings them closer to the emotional realm, and they therefore become very lively. Due to these traits, the metaphors are perceived as highly valuable in the field education as well (Ortony, 1975).

Various studies shed light on educational outlooks through metaphors. A metaphor could, for instance, act as a tool for understanding teachers' perceptions, beliefs and opinions, which are not always revealed in their verbal statements (Arnon, Shani & Zeiger, 1998; Zimmet and Dan, 2006; Strauss & Shiloni, 1997; Bullough, 1991). Thus, a metaphor may reflect latent or unconscious opinions and can therefore serve as a tool for understanding a person. This research utilizes metaphors in order to deeply understand the participants' perception of the Internet and their place in relation to it.

Population

The interviews were carried out among 20 female students who participate in online courses. All were students in teacher training. The average age of the subjects was 23 years and 5 months.

All students were in their second year of studies or over, as online courses were intended for students who have already completed a basic computer use course. The interviews were intended to thoroughly reveal the subjects' perceptions of various fields:

- Their perceptions and understanding of technology and information technology in particular and their position in relation to it.
- Their views about the contribution of technology to learning and E-learning.

Findings

Interview Analysis

The Students' Perceptions of Technology in General and Information Technology in Particular

Definition of Technology

Most of the examined students defined technology in terms of mechanization and instrumentation.

> *"Technology is … using instrumentation … using natural and artificial materials with the use of instrumentation."*

> *"Technology is first and foremost using instruments … technology comprises things that a person doesn't physically do, but the instrument … not only the computer, but also a CPR machine is a technology. An action performed by an instrument and not by the person himself. The person operates it."*

"Technology is computers, Internet, the whole development of cameras, electric appliances, everything that's advanced, that more developed than the past."

In other answers, a distinction appeared between the subjects' views of man and technology. Technology was seen to be an independent entity and stood in contrast to all that is "human."

"Technology is all that's related to mechanization and inhuman communication. Mediating through instruments. Not only communication. Anything which is mechanized or technical in a way is not human."

"Technology—a technical doctrine, or technical things, it's all practical, it's more … the concept is cold, it's cold … it has nothing human in it, like a robot … the computer is a sort of robot so we are closer to it and its concept gets warmer in this context …"

Other definitions included the aspect of innovation and discovery as part of the essence of technology:

"According to my understanding, it's all these innovations of course, we are talking about things which are like the mobile phone, the TV, the Internet, converters, cables, satellite TV and all those things in medicine that keep being invented, discovered and renewed."

Half of these definitions included a statement, according to which the purpose of technology is to advance human life and improve our quality of life. Various definitions consisted of a number of components.

"Technology is an innovation of man, related to machines and things that can help us progress."

A few of the definitions also included references to technology as knowledge, a field of study or a scientific application. Such definitions also included additional components such as innovation and benefit to mankind.

"Technology is taking science and making it practical, useful, using instruments, using materials. Taking the knowledge in science and making it useful, practical in the daily life of man. Harnessing knowledge together with technology for the sake of mankind, for the benefit of our quality of life."

Gender and Information Technology

In order to examine the perception of information technology and the role of women within it, the participants were asked to present a metaphor for the Internet, and to place themselves within this metaphorical image.

A number of suggested metaphors presented a varied approach to the Internet; particularly prominent was the ambivalent attitude toward this medium.

"The Internet is just like a rose. It has its beauty, grace and charm but also has its thorns, its dangers."

"The Internet is a field of roses. It is really beautiful. It is huge. Each flower has many petals, many leaves and it branches. Why roses? It has no smell, but has beautiful colors. It has thorns—so we have all the damages brought about by the Internet, like viruses and so on. And we have the good things it provides us; we have the information, the communication with the outside world."

The last subject referred to her place in the field in this way:

"I would like to be the groundskeeper … the gardener … I think I'm one of those roses from which … when it comes down to it, I build websites and do things with the Internet, so I am the same flower … this way … inside … without the thorns..."

This statement represents a mixture between the need to shape and control and a certain level of awareness to the restrictions of the ability to influence. This view of restricted ability appears in the following metaphor, also burrowing from nature:

"The Internet is an intricate garden, first of all because the way in which you pass from website to website like in a big, intricate garden—everything brings you deeper and deeper. Everything brings you in like a maze. And I am—in it—looking for a way out, because you can get sucked into it. You can stay online for hours and at some point you have to say: enough! Go outside!"

In this metaphor, the "suction" and "drift" features known to many Internet users are evident and are, in fact, parallel to the fear of loss of control exhibited by some of the subjects. This element appeared in images taken from the marine world:

"I have to think about what I think of the Internet and then I'll tell you. I'm thinking of something with both an advantage and a disadvantage. That can take you both up and down. If you don't use it properly. Maybe an ocean. You can catch really high waves but can also get caught in a vortex. And I'm in the shallow waters."

The water element is not always perceived as representing danger. At times, the exact opposite came up, as one can tell from the following metaphor:

"The Internet … I would compare it to water, as it's very essential. Just like we need water so much … as far as I'm concerned, yeah? ... it helps, it eases, it's fun, it's pleasant … the best thing in the world. Where am I inside this image? The person drinking it and enjoying every sip."

The following participant presented a metaphor, referring to the Internet as a process or journey of adventure:

> *"The Internet is a journey of adventure; you can never know where the next page will take you. And I am—the one who experiences all the adventures."*

This metaphor, like others, represents the student's view of herself as part of the Internet and not as being external to it. In the following metaphor, however, the subject sees her reflection alone, and not herself:

> *"The Internet is … I think it's like a mirror, like two mirrors on both sides as you go up the elevator, forever reflecting each other. You can look for one thing on the Internet and get to … I don't know what … it has no end. You arrive and can go further, again and again … it keeps developing … and it changes, becomes farther away or closer, depends on which 'mirror' you're looking at. And me—I'm exactly in the middle between the mirrors. Wherever I look, I'll always find something and will always find myself interested and researching. I can sit for hours without end."*

This metaphor brings about the student's perception of the Internet as seemingly infinite, as well as her understanding of the medium's dynamic quality, ever-changing and developing.

The Effect of the Internet and Changes over Time, As Viewed by the Participants

The participants argue—without exception—that the use of Internet had an effect on their lives. Most of them view this influence as a positive one.

> *"I start my morning with—a cup of coffee—Internet—email. 30-40 emails every morning for sure. Then it's my 'good morning.'"*

> *"It affected, of course! Wow, a lot! It saves a lot! First of all, it saves a lot of money. It saves mail; it saves time on the phone and endless search and wasting time when you're looking for something."*

> *"In the course of my work, I have a decreasing need for preparing the material. I can use whatever's in the resource and in the same way—enrich others with what I have. And without knowing each other, we enrich each other with learning materials and work without limitations. In the same way, we correspond with each other quickly and transfer various materials."*

> *"The most significant thing is getting to know other people. Not necessarily from Israel. It also contributes to what I'm learning. You speak to someone and then find out you're improving. You help him. Getting to know and communicating with other people."*

While the effect of the Internet on their lives is perceived as positive, the participants claim that the effect on their surroundings, family members, friends, acquaintances and

especially children and youth, is at least somewhat negative. This effect is perceived as negative especially in the context of loss of control over time, becoming addicted to the medium and harmful social communication.

> *"It locks certain people and children inside the house. They only communicate inside the house and don't go out. I personally know some people who are like this. To others, this doesn't disturb the social life. Some people carry out their entire social life inside the computer."*

> *"It's important to know how to set boundaries for the kids, I don't know how. My little sister, for instance. She shouldn't see what she sees there. She writes messages to people—who knows who they are. You don't know who you're writing to, who's behind the screen. It's all very mysterious."*

> *"I teach kids and check where they surfed to. And I find it out. They are very smart, but not smart enough to delete it. I see where they hang out. I also keep a watchful eye on my daughter. I know they can get to places I don't want them to get to. I also don't want them to 'copy-paste' for me, but to read the material and study it."*

Many students openly describe their initial use of the Internet as one accompanied by fear and frustration along with a certain sense of excitement through the initial usage period. Some participants described excitement alone, but were a minority.

> *"Wow, my first experience was—fear. A fear of maybe ruining something, a fear of going into somewhere I am not supposed to go in. There are some things that you "blindly" go into. I don't know. I didn't learn it and then got in. It's all an initial experience. But after one or two times you can see that the computer is not so big. There's nothing to be afraid of."*

> *"I really don't remember … all I remember is a sense of excitement that was very … we were looking for a bus schedule and didn't need to call the bus company … or the train … I remember that to be one of the first things that we experienced on the Internet … I remember a lot of excitement during the first couple of times."*

> *"When I started studying here at the college, it was very hard for me. I remember a lot of helplessness. In fact, I made many phone calls to my uncles who know more about it. But when you know how to make the first step, I think, it pretty much works out."*

Most of the interviewed participants reported a rise in self-confidence over time concerning surfing and using the Internet, as well as an ability to focus and concentrate better on the purposes of surfing. However, as the usage purposes expanded, the time allocated for using the Internet did not decrease as a result of the enhanced ability to focus, but increased. The participants also reported a rise in enjoyment at the same time.

"The surfing patterns became more and more efficient. I used to be really disoriented. Today I can get to any site. You learn, just like driving."

"I could be online for hours, both for pleasure and for work. In the beginning I was using it less, until I realized what to do here and there … I enjoy more today."

"I used to use the mailbox to read the news, and today I use it to get more information, to delve into things. To communicate with people. I sit in place, write, speak to my sister-in-law in the US- for an hour. It's a whole other world, it upgrades your life. She's having a Bar-Mitzvah and I am planning it from Israel."

Views about Technology's Contribution to Learning and E-learning

The interviewed students had no doubt that the use of technology, and information technology in particular, benefits learning. Differences between replies were only different in reference to the essence, level of contribution or the position of the teacher in the learning process.

"If there is a combination of a several tools and Internet, or any other form of instrumentation—it broadens the horizons, increases the possibilities of finding varied and diverse materials. On the Internet, you can get in contact with other people in the purpose of learning."

"If you give children some work that they have to search for on the Internet, it develops their ability to think."

"One of the ways to achieve access to information is using the Internet, and I incorporate it into projects many times. They really like it. All the students are Internet savvy. It's incredible. They spend hours there. It's also more interesting. Stepping out of the books and notebooks routine for a while. It also exposes us to a whole new world."

The attitude toward the online course was diverse. Most students noted the convenience of E-learning, as it is flexible in terms of time, place and distribution of effort. Some of the students mentioned the lack of interaction with the teacher and social interaction as a disturbing and hindering factor. Some of the students claimed that the workload in such a course is heavier than normal.

"In my opinion, the time period between units on a virtual course gives you time to think clearly and carry out the task in the best way possible, but you have to be a serious person … you need a special character to enroll in a virtual course. Very neat, very precise, knowing how to organize your schedule."

"I have my reservations. On the one hand, it saves time. You don't have to come, you don't have a class. On the other hand—it's more work. Because you go in, you suddenly forget, you get out, you tend to postpone. It has an advantage as

well. In all courses I participated in, I was given more resources for assistance; for myself, and for my future work as a teacher as well."

"Not everyone has the tools to deal with such a course. Organizing tools. What do they mean here now? What do you do here now? The lecturer is not there to answer every question all the time. Distant learning is not for everyone, it demands a bit more independent learning."

"The only thing bothering me about an online course … there were some online courses where I didn't know my lecturer. I really miss the human aspect, the personal aspect … of getting to know people … a lot! That's the only disadvantage."

"The relationship between the lecturer and the student is very important, and the online course has no such thing. In class, you learn the same material and you have the interaction with your lecturer. That's what makes the lesson valuable. Here, you don't have someone to interact with. Who will you interact with? The computer? The communication with the lecturer is important."

Most of the students did not view the online course as a framework with any other value aside from the content taught, besides the increase in technological proficiency. A number of students pointed out the need to improve learning skills, such as the need to develop better information processing skills in a more independent way, compared with a regular framework.

"I think it only improved my abilities of searching various websites, as far as information resources are concerned. Beyond that—it didn't introduce me to anything new."

The following student stated the advantage of having unlimited time as a valuable factor of the online course:

"OK, let's assume I am studying English in a regular class and the teacher is conducting the lesson—how many opportunities does she have for arguing with students during the lesson? Or convey, discuss something? The lesson with the teacher has a fixed duration. During an online course, we receive a lesson, learn in it, talk amongst ourselves, we give each other notes, receive feedback, give it back … without limitations … in ease, with a pleasant feeling."

The next saying presents yet another advantage of the online course: the ability to behave in a way which is free of social inhibitions:

"You sometimes feel embarrassed to say something and you don't want to say it in class. It's more comfortable between the teacher and you—during the online lesson through messages, it's more personal."

The following is a numerical summary of the distribution of answers to the fixed interview questions (in some questions, participants chose more than one answer). Sorting the answers was done separately by more than one evaluator. Due to the relatively small number of participants, I saw no reason to conduct statistical analyses and tests of significance.

What is Technology?

Chart 1
Distribution of Answers in Relation to the Essence of Technology

Instrumentation and mechanization	Knowledge/ method/way/research science	Assisting the advancement of mankind	Innovations/inventions
9	5	10	4

Metaphors:

Chart 2
Distribution of Types of Metaphors*

A. A journey or adventure	B. Sea/ocean	C. Flora/garden/ roses	D. Infinity	E. Tool/ vehicle
1	6	4	4	2

*Some definitions addressed more than one category.
*4 participants failed to offer a metaphor.

Chart 3
The Effect of the Internet on the Participants

Positive (unequivocal)	Negative (unequivocal)	Not explicitly defined
16	1	3

Chart 4
Distribution of Effects Perceived as Positive*

Finding information	Saving time	Education-based communication	Past time/social communication	Downloading files
7	3	8	6	1

*Some participants stated more than one effect.

The Effect of the Internet on the Human Environment:

Chart 5
Distribution of the Perception of the Internet's Effect on the Human Environment

Negative	Positive	Both positive and negative
4	6	10

Chart 6
Distribution of the Types of Effects the Internet Has on the Human Environment

Social communication	Addictive symptoms	Searching and finding information
12	5	4

Initial Use of the Internet:

Chart 7
Distribution of the Descriptions of the Initial Use of the Internet

Worries/ fear/ determent/ frustration	Quick adjustment	Lack of control over time	Great excitement/ interest	Don't remember
10	1	2	7	2

Changes over Time:

Chart 8
Distribution of the Descriptions of Changes over Time

More confidence/ fear vanishing	Use of time is more focused and a more efficient, focused search	Unchanged	Expansion of uses	More surfing time	Less excitement
7	10	1	14	8	1

Chart 9
Degree of Technology's Contribution to Learning

Contributes	Does not contribute or makes things difficult	Does not contribute/ weighs down	Contributes as long as there is guidance	Depends on amount (benefits in combination with other means)
15	1	1	1	2

Online Course

Chart 10
Distribution of Types of Opinions Concerning the Online Course*

More useful than a regular course	More difficult/ intensive than a regular course	In need of more communication	Convenient
5	9	7	10

*These categories were formed based on the classification of participants' replies.

The Value of the Online Course, Aside from Its Contents:

Chart 11
Distribution of Opinions Concerning the Value of the Online Course

Has value, improved computer skills	Has value, improved independent learning abilities and time management	Has value, access to new contents	Has value, new mode of communication between students	Has value, improved ability of expression in writing	Has value, less fear	No value other than contents
6	3	3	1	1	2	5

Discussion

Within a few years of its initial broad usage by the majority of the Western world, information technology had become an ever-useful and popular tool. The use of it spans across domains and populations. The Internet penetrated, among other areas, the field of education, and its usage merged with new methods of teaching and studying. There is no doubt that the use of Internet highly influences our present-day individuals and society. From time to time, quite a few questions arise concerning the correct and proper use of the Internet, surrounding educational contexts in particular.

Therefore, it was important to examine the role played by the Internet in the lives of students of education—teachers of the future generation. Examining their attitudes toward the Internet and the computer world in their lives may shed a light on the unique way in which women perceive the information technology and the part it plays in their lives, which may have implications on their future teaching.

Twenty female students of education, studying at an academic college of education, were interviewed during this study. In the course of the interviews, we reviewed their attitude toward the Internet, changes over time since their initial exposure to it and their opinions about online courses they participated in using the Internet.

Main Findings of the Study

Female Students' Perception of Technology, Information Technology and Their Approach toward It

Most of the participants viewed the term 'technology' as being analogous to instrumentation and mechanization. Technology was at times seen as an independent, innovative entity, but contrary to anything "human." Only a few definitions included the reference to technology as knowledge, a field of study or a scientific application. Technology was perceived as an uncontrollable domain.

The participants offered various metaphors of the Internet, representing their perceptions of the information technology. The metaphors expressed an ambivalent approach toward the Internet, expressing itself both as a blessing and a danger. Some of the metaphors represented their perception of the Internet as an enormous, infinite world, unmanageable and highly dynamic. The participants described a positive effect of the Internet on their lives and a process of growing ability of control over the years. Alongside this, they expressed the fear of the Internet having a somewhat negative influence on their acquaintances, especially on children and youth.

Opinions Concerning the Contribution of Technology to Learning and Concerning E-learning

The participants agreed about the contribution of technology in general and the information technology in particular to learning. In relation to the online course, most students stated the convenience and flexibility provided by E-learning. Some of the students pointed out the importance of interaction with the teacher as a significant element of the course. However, most students did not find the online course as having an additional value beyond the learnt contents, aside from the improvement of computer skills.

The findings reveal a unique image of the understanding of the "world" of information technology. The interviewed students perceive this world as being a part of their lives, which expands over the years. These days, the Internet acts as a useful and necessary tool for them. Nevertheless, it does not seem that the participants view the Internet as an object over which they have control (or control over its development). The chosen metaphors attest to this view, describing the information technology as a flowing river or a stormy sea—always moving, always changing and unpredictable. In the best case scenario, they are watching and enjoying it; in other cases—they get swept away. But in no scenario do they affect its dynamics.

It is worth mentioning that the students have come a long way since first being exposed to the Internet and up to the stage of the interview. The first part of the experience included a threatening, deterring element, but this feeling vanished in time, being replaced by enjoyment and satisfaction.

Shen'ar (2001) notes that the Internet is being hailed as a symbol of knowledge acquirement and unprecedented communication. It is considered to be a tool which increases man's ability to stand out in his environment and which frees him from limitations and influences in tracking, acquiring, accumulating, transferring and preserving information. Seely Brown and Duguid (Seely Brown & Duguid, 2000) have emphasized the subject of information and its social importance. Their conclusion—that life does not become simpler thanks to these vast amounts of information—is reinforced by the findings of the current study. The approaches to information, its usage and the creation of new information will not be similar among all people, but will be "colored" with the meaning given to them by each individual.

The current study presents two facets of women's attitudes towards the Internet: on the one hand, it is seen as a beneficial and useful tool for their lives, while on the other hand, the metaphors attest to its perception as an enormous world with constant, unpredictable movements and changes.

The students' definitions of the term 'technology' consisted of the positive element—the purpose of technology is to ease human life and improve the quality of life in various ways. The students claim that the use of technology in general and information technology in particular, are highly beneficial for learning, as expressed in online courses. They state this view along with a reservation about the heavy workload and the lack of physical communication between a teacher and a student. However, the students do not view the online course settings as having an additional value beyond the contents learnt, aside from the development of technological skills. At this point, it seems that the use of the Internet in a learning environment is not seen as a unique contribution in the eyes of students of education.

Various studies emphasized findings, according to which the percentage of men choosing scientific and technological professions is higher than the percentage of women (Abelson et al 1995, Camp, 1997; Frankel, 1990). These studies reveal that women's level of confidence around computers is lower than that of men. However, according to the findings of the interviews, the students do not feel insecure around computers, this in contrast as well with findings of earlier studies that compared feelings of female and male students (Abelson et al; Camp, 1992). The reason is perhaps the nearly complete lack of men in the reviewed E-learning environment, or the level of their experience, causing a heightened level of confidence.

In a study conducted by Ong & Lai (2006), it was found that women's perceptions of the E-learning environment were affected by their own efficiency in computer usage and the ease of use. It seems that the students' ability to deal with the challenges of the E-learning environment has reinforced their positive perception of the Internet environment as a learning environment and, at the same time, helped them to be empowered in it.

It seems that women have come a long way, especially in the past two decades. In a study by Sakamoto (Sakamoto, 1994), it was reported that among "heavy" computer users, the ratio between men and women is 4:1. In addition, studies from the recent decade show that aptitude in the field of computing is perceived as being related to "manly" achievements, although the women's potential is at least equal to men's, and despite the rise in the number of women working in technological professions. The present study reveals the beginning of a changing trend in women's approach to computers. It is possible that this trend is leading or will gradually lead to a change in society's attitude towards women's position in this world of technology.

It is possible that the mixed feelings exhibited by the examined students were also related to the context and the social-educational communication in which they appeared. It seems that that such findings correlate to the conclusions arrived at by Wang, Kanfer, Hin and Arvan

(Wang, Kanfer, Hinn & Arvan, 2001). The researchers stated that although it is a common belief that women feel more insecure and technophobic around computers than men, but they are, in fact, insecure due to the manner in which computers are used in various universities.

The relative sense of confidence of the examined students in the E-learning framework marks, in my humble opinion, a changing trend of confidence in a computer environment and the Internet environment in general. The findings of the current research correlate to those of Price (Price, 2006), who examined the subject of gender-based differences in varied contexts in the performance, accessibility and experience of women in online courses. An analysis of Price's study findings reveals those women who learn in an E-learning environment are found to be more confident and independent students, who may also surpass their male peers. They do not have a more limited access to computers and the Internet than men and do not tend to participate less in online courses either. They value guidance more than men and possess different styles of communication than men.

It is hard to tell whether the students' perceptions represent the perception and insights of women as a whole. For this kind of understanding, it is necessary to expand the survey sample and make comparisons to other populations and the perceptions of men. However, it is still possible to study the issue using this detailed case of female students of education, comprehend their view of information technology and their place within it, and understand what the implications of this understanding are for their future roles as teachers in educational settings.

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