An Analysis of Internet Adopters

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Abstract: *Millions have gone online in the past five years but not all have completely adopted the Internet. This research employed Q methodology to classify Internet users and explore reasons why some users are more inclined to embrace Internet technology than others. The respondents were 40 college students who sorted a 46-statement Q sample. Results revealed three distinct viewpoints toward the adoption of the Internet. "Assimilators" absorb and incorporate the Internet into their thinking and lifestyle. "Convenience Users," seeking instant gratification, move quickly on the Internet; they hop on to get what they want when they want it and then hop out. "Reluctant Users" prefer real-life experiences to the virtual ones offered on the Internet. They like face-to-face interaction with other people and have a fear that the seductive power of the Internet might change their lifestyle. A usage survey that accompanied the Q sort also showed that three groups are different in the purposes of their Internet use. Communication was the most important purpose of Internet use except with the Reluctant Users, who valued information gathering more than communication. Respondents' gender and level of perceived Internet savvy seemed to be factor predictors.*

Introduction

As the number of worldwide Internet users has increased dramatically, researchers have sought reasons for the rapid rise in Internet use, especially after the introduction of graphics-based Web navigators. For example, a recent report from the Pew Internet and American Life Project (2001), "More online, doing more," showed the frequency distributions of different purposes for which people used the Internet, such as connecting with other people through e-mail; gathering general news, news or information about politics and major political campaigns, information on financial, medical or job-related matters, or information about their hobbies; doing research; surfing just for fun; doing online shopping; and buying and selling financial instruments (Princeton Survey Research Associates 2000, 5-6).

These beneficial uses of the Internet, however, show just one part of the picture. The Internet offers a massive array of possibilities, yet its appealing features also have corresponding drawbacks. For instance, complex issues of how to verify and evaluate Internet information, and how to insulate children from pornographic materials and the seamier side of the electronic world accompany easy access to information and news via the Internet. The

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convenience of cyberspace shopping invokes concerns in some consumers' minds about the security of personal financial information, and potential for invasion of their privacy or for disputes with merchants over undescribed or indescribable qualities of products. Recreational use of the Internet raises the possibility of addiction to its endless entertainment opportunities. While the Internet is a powerful communication tool that can be used to build and strengthen relationships, the act of using it can simultaneously isolate people from interpersonal interaction.

Innovation-diffusion scholars (Rogers 1995) have suggested that attributes of innovations appeal differently to users in the innovation-adoption process. Describing the aspect of acceptance that counts most in the adoption process, Rogers and Shoemaker (1971, 138) wrote, "It is the receivers' perceptions of the attributes of innovations, not the attributes as classified by experts or change agents." Since people are not uniform in their backgrounds, personalities, needs, and levels of satisfaction with traditional mass media, they perceive the benefits and drawbacks of the Internet differently. Some individuals have enthusiastically adopted the Internet, while others have not. There are users who have embraced the Internet enthusiastically, but others have shown only lukewarm attitudes toward it. Walsh and White (2000) found that the use of a new technology has a different appeal for various groups because each group adopts the new technology based on a cost/benefit trade-off specific to that cohort.

In the United States, 47.7 million people had Internet access at work as of April 8, 2002, and 84.9% of them (40.5 million) were active users. At the same time, 165.9 million people had Internet access at home, but only 48.5% (80.4 million) were active users (Nielsen/NetRatings 2001). The initial wave of Internet adopters tended to be heavy users of the new medium. Today's much larger group of Internet users represents more generally a cross section of the population. "Active users" now tend to spend less time online than before in tandem with the broader user base (The Pew Internet and American Life Project 2001).

This study was conducted to 1) to classify Internet users into different types according to how they use and perceive the Internet, 2) to understand how these groups are different in terms of embracing the Internet, and 3) to investigate whether user demographic characteristics are factor predictors.

Background

Under the guidance of the junior author of this paper, students at Elon University in North Carolina completed a research project[1] detailing how 25

[1] The Elon-Pew Internet Study findings, along with stories and photos of all the students and families involved, can be found on the Web at http://www.elon.edu/pew/oneweek.

families in a small town in North Carolina used the Internet during the week of Jan. 12-19, 2001. The work, titled "One Neighborhood, One Week on the Internet," was completed in partnership with the Pew Internet and American Life Project, a Washington D.C.-based initiative that explores the impact of the Internet on American society.

Through extensive entry and exit interviews with the families and analysis of their time-use diaries, student researchers found that the Internet has altered the lives of project participants. The respondents said they use the Internet to gather crucial health information, facilitate job searches, improve shopping habits, and, most importantly, increase communication between family and friends through e-mail and instant messaging. While most of the people interviewed were excited about the wide-open possibilities they have found through communicating and doing research online, others were concerned about some of the changes being wrought by the digital information age. The authors generated the Q sample and survey questions from time-use diaries and interviews conducted by one group of Elon students with "One Neighborhood" family participants. A second group of Elon students sorted the 46 Q statements and responded to the survey questions for this study.

Literature review

The "One Neighborhood" project suggested the following major categories of Internet issues, which this article illuminated in this review: information and news gathering; financial, political and other transactions; shopping; entertainment; and connectedness and isolation. The category of individual feelings was added to understand attitudes toward the Internet. Societal impact was added, since scholars often mentioned it as an important category. Because the area is evolving rapidly and has not yet received wide scholarship in OS, a broad sweep of the literature was given here to serve as background and orientation. Since the advantages of the Internet have been long and widely publicized, emphasis was put on its negative side in literature review for this study.

1) Information and news gathering

Information glut: The opportunity to gather information and news quickly and in abundance has brought many people to Web sites. According to Flanagin and Metzger (2000), people use the Internet more than other media as an information source. But an abundance of information can work as both a blessing and a curse. Search engines and portal sites still respond to queries with "answers that are too broad or just plain wrong," said Tim Berners-Lee, Director of the World Wide Web Consortium. The situation will not change until search engines can function as "global reasoning engines," to collect data

from the user interactively and winnow out irrelevant search results (Seminerio 1998).

Credibility: Research on the credibility of traditional versus Internet information sources has not produced consistent findings, because researchers use a concept of credibility defined in multiple ways. Thus, Flanagin and Metzger (2000) operationalized it as a multidimensional concept – a mix of believability, accuracy, trustworthiness, unbiasedness, and completeness. According to their research, for the whole spectrum of information people perceive the Internet as a less credible source than newspapers, but equally credible as magazines, radio, and television.

Harmful materials, especially to children: Many harmful materials abound on the Internet: pornographic content in text, pictures, short animated movies, or sound files on the Web and sexual talks in discussion groups. Even when children do not seek out pornography on the Web, it may be encountered in a chat room or through junk mail. Because the Internet is accessible worldwide, regulations on web contents must be administered internationally to be effective. Cultural, moral, and legal variations, however, may even preclude uniformly defining pornography among countries, much less regulating it (Akdeniz 1997). Access control at home is also not effective because current filter programs, despite huge advances in technology, often block legitimate information concerning health and sexual education issues while allowing access to questionable material. Access control in public libraries would raise First Amendment issues, because it could be seen as limiting free speech and the free exchange of ideas (Knowles 2000; Nodell 2000).

2) Financial, political, and other transactions

Economic activities: People have purchased and sold stocks, bonds, and mutual funds through the Internet, even as the recent slow financial market has driven some to the traditional full-service brokerages (McGeehan 2001). Electronic bill presentment is growing much faster than generally believed, as companies are investing heavily to set up e-billing systems to reduce costs. Utilities, broadcasting companies, and telecommunications firms are among the quickest to adopt online billing solutions, while manufacturers are the slowest (Kelsey 2001). Many more people are now filing personal tax returns via the Web (Powell 2001).

Voting: In the political arena, Americans have painfully seen the need to modernize voting technology. Some like the idea of Internet use to disseminate voting information, while others are suspicious of the honesty of individual vote counting in an online election. In a poll conducted in March 2001, 60% of people ages 18-24 said they support Internet voting; however, a tally of the

respondents of all ages in this poll indicated only 39% believed that the Internet should be used as the mechanism for voting in governmental elections (ITAA 2001).

Security and privacy: Current attitudes about online transactions are greatly affected by the thorny issues of security, confidentiality, and privacy. Malicious hackers compromised the computers of even big institutions and corporations such as Citibank and Bloomberg. In a worst-case scenario, online music store CD Universe suffered in January when angry hackers dumped onto the Web the credit-card numbers of its tens of thousands of customers (Salkever 2000). For online purchases there have been some attempts to develop a single-use credit card number linked to a customer's permanent credit card account as a preventive measure against cyberfraud (Salkever 2001). It will take time until general use of such a strategy is widespread. Some people, including college students, do not feel comfortable with leaving behind traceable digital trails (Lee 2000a; 2000b).

3) Shopping

Online shopping attracts people with its many advantages, including elaborate search functions (eStatNews 2001) and detailed information about the product (Regan 2001). E-tailing provides access to products the world over and offers of goods and choices no bricks and mortar retailer could manage.

Problematic online service: Although online businesses have improved their customer relations services over the years, many shortcomings still exist. This is illustrated, for example, in a recent study about the Christmas 2000 e-tailing season that showed 67% of Christmas holiday gift deliveries from online stores were not received exactly as ordered, and 12% were not delivered before Christmas 2000. Online shoppers also reported problems in returning unwanted or damaged goods (Accenture 2001).

Slow adoption among young customers: One in five people in the United States between the ages of 8 and 24 purchased goods online in 2000 using (with parental consent) credit cards or payment cards belonging to their parents. Barriers to e-commerce for young people are still numerous. Many have no credit cards; they are impulsive and more likely to prefer finding goods on the spot at a brick-and-mortar retailer over waiting days or weeks for delivery of an order placed online; they like to handle goods before purchase; and seeking the social experience of "actual" shopping, they prefer shopping at the mall in peer groups to shopping alone on the Internet (Nua 2001; Ipsos-Reid 2001). But some researchers expect e-commerce among youth to grow significantly when monetary strategies such as e-Wallets, online purchase cards, online bank accounts, and debit cards targeted to teens are more widely adopted (Harris Interactive 2001).

4) Entertainment

Addiction: Even though their percentage is low, some online users become addicted to the Internet just as others manifest addictions to drugs, alcohol or gambling, all of which result in significant academic, social, and occupational problems (Young 1996). Greenfield polled more than 18,000 Web users and found that nearly 6% had a serious compulsive or addictive usage problem, according to criteria adapted from studies of compulsive gamblers, and another 4% had mild to moderate problems (Greenfield 1999). Some psychologists, though, doubt that "addiction" is the right term to describe what happens when people spend too much time online (DeAngelis 2000).

5) Connectedness and isolation

The impact of the Internet, and particularly e-mail, on individual human relationships appears to have changed from that of an isolator to a connector, as more people enter the virtual Internet community. But a proliferation of unwanted messages bombarding users may wither that community unless effective ways are widely implemented to curtail "Spam" and "junk" e-mail.

When users are bombarded with unwanted e-mail messages in abundance, there is a chance of feeling overwhelmed by them. According to the Congress Online Project, members of the U.S. House of Representatives received only a few dozen e-mail messages per week and U.S. Senate members, several hundred per week prior to December 1998. In 2001, congressmen received as many as 8,000 e-mail messages a month and senators, as many as 55,000 e-mail messages each month, according to a study by George Washington University and Congressional Management Foundation (2001).

A 1995-96 study by Carnegie Mellon researchers found that heavy use of the Internet might lessen communication with family members, shrink the social circle, and increase potential for depression and loneliness. The study indicated that the time previously spent on social activities might be diverted to using the Internet. Heavy users may claim that they can make social connections online, but virtual relationships are usually not as strong as those brought about by face-to-face contact. In one study, for example, just 22% of the respondents who had used the Internet for two or more years made a new friend on the Internet. The number seems to be low in comparison with the likelihood of making friends in the real world (Kraut, Lundmark, Patterson, Kiesler, Mukopadhyay, and Scherlis 1998).

In a Stanford study, released in February 2000, Norman Nie asserted that the Internet causes widespread social isolation and erodes human contact among family members and friends (Nie and Erbring 2000). In a critique of Nie's study, Stefani Eads (2000) admitted that more time spent online means less face time spent with other people. She pointed out, though, that the

Internet also could create or strengthen human relationships. Some relationships could not exist any other way, especially for homebound people and those in isolated geographic areas. Weak social bonds among members of online communities could be strengthened when they have a geographical meeting place or a non-anonymous conversation. The friendships built in cyberspace could not be any less real or valuable than ones forged offline.

Jeffrey Cole and others of UCLA found a similar result after surveying 2,096 households across the United States. The study found that the Internet users were not socially isolated people, but actually stayed in contact with more people and communicated more with their families and friends than when they were non-users, even though they had to socialize slightly less with their household members. They also devoted more time to clubs and volunteer organizations and even exercised more than non-Internet users (Cole et al. 2000). Other studies found similar results: Most respondents expressed the positive effects of the Internet, bringing families closer together and creating a richer fabric of community (Nua 1998; DisneyOnline 2001).

In an Italian focus group study, users were found to connect often to the Internet in the company of friends or family. Similarly, users relied on information that friends and relatives found on the Internet and recommended when selecting movies to see or books to read. After reading the information on the Internet, these users were found to conduct Internet content-inspired discussions with others in many situations when they were not online (Does the Internet mean social isolation? 1998).

6) Individual feelings

Individual feelings toward the Internet vary, as demonstrated in Elon's "One Neighborhood, One Week on the Internet" project (*Town of Elon, N.C.* 2001). Some respondents said the Internet makes people lazy; others said it provides them with the opportunity to find an enormous amount of information, so it actually makes them much busier. Some individuals indicated that they look forward to new developments in Internet technology, while others said the current features of the Internet are more than enough. Some respondents said they don't use the Internet much at home, preferring to relax while using a traditional medium such as books or TV; others said they enjoy the Internet at home, not limiting its use only to doing work at their job or school.

7) Societal impact

The Internet could spark sweeping cultural and societal changes, bringing social cohesion as well as the development of an electronic public space where virtual communities flourish. If the Internet is allowed to continue to develop without constraints, it could also become one of the greatest tools ever for fostering freedom and democracy (Pavlik 1998, Chap. 10).

New technology, including the Internet, does not necessarily have one face. Long before the arrival of the Internet, Jacques Ellul lamented that modern society values technological efficiency as an end in itself, regardless of the social, political or environmental costs (Ellul 1964). Arguing that technology is never neutral, Lyon recommended that human beings should shape new technology rather than allowing new technology to shape society (Lyon 1986).

The fantastic interconnection of computers that makes the Internet possible and powerful has the potential for wreaking havoc at the global level. For instance, the ILOVEYOU virus infected more than 100,000 systems within a few hours and tens of millions within days, costing businesses an estimated $6.7 billion over the first five days. In North America alone, 6,882 person-years (defined as one person working a 24-hour day, 365-day shift) of productivity were estimated to be lost between August 1999 and July 2000 due to malicious attacks on computer systems (Hulme 2000).

As Elon's Internet project participants indicated, people vary in embracing the Internet technology. The difference will be explained by the benefits or harm they experienced or perceived from the use of the Internet in areas, such as gathering information or news, transactions, shopping, entertainment, or connecting with others. Their adoption of and attitude toward the Internet would be influenced by the Internet's impact on themselves as individuals and society in which they live. This study aimed at showing how people looked differently at the advantages and disadvantages of the Internet and adopted the Internet to a different degree. Also the study investigated whether user demographic characteristics were related to the types of Internet users they were.

Method

In order to collect people's perceptions of Internet issues, Q methodology was employed since Q methodology enables "measurement of anything subjective to the person." The methodology provides a "basis for measurement of feelings, attitudes, opinions, thinking, fantasy and all else of a subjective nature" (Stephenson 1967, p. 11).

Q sample: Statements were generated from the data and interviews gathered by the student researchers in Elon's "One Neighborhood, One Week on the Internet" project. Since statements on societal issues were rarely found from this project, additional statements were selected from an extensive review of online and offline articles and books. These statements were divided into the eight subject groups in the table following. The resulting 377 statements were were reduced to a Q sample of 46 representative items — a manageable number for Q sorting. Some categories have more statements than others, reflecting the complexity of the issues represented.

Table 1. Structure of Q Sample

Category	*Statement Numbers*
Information credibility	1, 9, 17, 24, 32, 40
Abundant information	2, 10, 18, 25, 33, 41
Harmful materials	3, 11, 26, 34
Transactions	4, 12, 19, 22, 27, 35, 42
Entertainment	5, 13, 28, 36
Connectedness	6, 14, 20, 29, 37, 43
Feelings toward the Internet	7, 15, 21, 23, 30, 38, 44, 45
Societal impact	8, 16, 31, 39, 46

Person sample: A sample of 40 students from five communication classes at a 4,000-student private liberal arts university completed the questionnaire. The use of a student sample in this research has some advantages because they are all relatively familiar with the Internet. The participants were 32 females and eight males, ages 18 to 23. Among these, 35 whites, four blacks and another minority student; 29 regarded themselves as savvy users and nine others as non-savvy users.[2]

Q sorting: The statements were sorted on a nine-point most agree/most disagree scale during March 2001. (See figure below.[3]) They were asked to rank the 46 statements and score them according to how strongly they agree or disagree on each. For example, they chose the three most strongly disagreed statements and assigned rank scores of -4, and chose the next four statements they disagreed most strongly and assigned -3. At the end, strongly disagreed statements got low minus scores; strongly agreed statements got high plus scores; and statements sorters felt neutral toward or undecided about got scores in the middle. All respondents were also asked to make comments on statements they assigned rank scores of -4 or 4.

Q-sort distribution

-4	-3	-2	-1	0	1	2	3	4	*Score*
3	4	5	7	8	7	5	4	3	*Frequency*

[2] Two respondents did not answer this question.

[3] The question is frequently raised whether a forced Q-sort distribution requirement has any impact on the result. In factor analysis, distribution effects are virtually nil — the existence of factors being affected almost entirely by the patterns of item placement, not the exact place of each item.

Factor analysis: Responses were entered into the MQMethod program for Macintosh,[4] which intercorrelated individual Q sort responses in a 40 x 40 correlation matrix. Factors were extracted using the principal component solution. Varimax rotation was used to produce simpler structure.

Importance of Internet activities: Further information was collected on the importance of Internet activities to their lives by asking respondents to rank their Internet use across six categories: 1) getting news; 2) gathering general information; 3) shopping; 4) transactions other than shopping, such as paying bills/taxes, travel research; 5) entertainment — music, games, puzzles, surfing the Internet for fun; and 6) communication tools. The assigned ranks ranged from 1, the most important, to 6, the least important.

Results

A 3-factor solution was selected based on ease of interpretation, with 32 out of 40 people aligned significantly with only one factor. Three interpretable factors, or types, accounted for 44% of variance in the respondent set. Moderate correlation was found between factors as shown below.

Table 2. Correlation Between Factors

Factor	*1*	*2*	*3*
1	1.00	—	—
2	0.46	1.00	—
3	0.30	0.39	1.00

Four consensus statements, on which all three factors were similar, emerged in analysis. Respondents in three factors all seemed to be angry about junk e-mail coming from businesses or pornography sites and chain letters, because they had to take time to process these (20).[5] Respondent 12[6] said, "I get all sorts of junk mail, I don't even open it anymore." They were neutral toward paying bills online (27). Also respondents showed a neutral attitude toward the potential of the Internet for fostering freedom or democracy (8) and for fragmenting society by exposing people to diverse views (16).

The remainder of this work focused on analysis of these three factors as reflected in their Q sorts. Statements with rank scores of +4, +3, -3, and -4 reflect the intense feelings and attitudes of each respondent and characterize the factor, so analysis was mainly focused on the interpretation of those statements (Brown 1980, 23-4).

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[4] MQMETHOD is a public domain program, can be retrieved from: <http://www.qmethod.org>. The program is also available in PC and Unix versions at this URL.

[5] For easy reference, statement numbers were added in parentheses as necessary.

[6] Refer to Appendix 1 for information on sorters.

Table 3. Consensus Statements

Statement	*Q sort Scores*		
	F1	*F2*	*F3*
8) I don't believe the Internet will be used to foster freedom and democracy.	-1	-1	-1
16) The Internet exposes people to a multitude of different views, so it will bring about more social fragmentation.	0	0	0
20) People e-mail me with stupid stuff. It can be a waste of my time.	3	4	3
27) People I know are paying bills online and they say it works, but I'm reluctant to do that.	1	1	0

Factor I: Assimilators

Assimilators are those who absorb and incorporate the Internet into their thinking and lifestyle. Two males (25% of all male sorters) and 18 females (56% of all female sorters) were aligned only with the largest factor explaining 22% of variance. Seventeen whites, two blacks, and one other minority student were in this group. Among 19 Assimilators who answered a question on the perception of their Internet familiarity, 17 (89% of the factor) regarded themselves as savvy Internet users, two (11%) as non-savvy users.

Assimilators were significantly different from the other two groups in the sorting of statements 5, 7, 33, 34, 36, 37, 38, 39, and 41, as shown in Table 4. Members of this group assimilated the Internet successfully in their lives. Sorters in this group used the Internet a lot and might be dependent on it, but the Internet was just part of their daily lives (36). Rather than being frustrated with a glut of information, this factor smartly bookmarked Web sites for frequent and easy access (33) and expected that future technology will solve this problem (41). As a group dominated by savvy users, it looked forward to further developments in Internet technology (38). But this group did not suffer from excessive Internet use, noting no problem with spending too much time on the Net (5) or isolation from family members (29).

Assimilators acknowledged the benefits of technology, believing that computers and the Internet are not a necessary evil (7) and agreeing that technological change would be beneficial rather than harmful to society and its culture (31). This group also recognized the opportunities that the Internet provides for a virtual community of support and information (39), not seeing much difference between e-mail and face-to-face communication (14). Of course, these sorters admitted to the limitations of the Internet by agreeing that

Table 4. Assimilators: High Salience Statements

Statement	*Score*	*Z-score*
36)** I use the Internet a lot, and I may now be dependent on it. But I think of the Internet now as just part of my daily life.	4	2.09
17) I don't think the Internet is the final authority on information. I take the Internet as one of many sources of information.	4	1.92
37)* E-mail is OK with me even though I don't get the instant reply I do with a phone call. I still feel connected to people.	4	1.69
41)* In the future, I most look forward to better search engines that will help me find what I want to find and not give me 40,000 results from one word.	3	1.66
39)** The Internet will provide a virtual community of support and information.	3	1.54
20) People e-mail me with stupid stuff. It can be a waste of my time.	3	1.33
33)** I mostly bookmark Web sites I frequently visit, so I could get quick access to them.	3	1.18
31) Technological change brings with it more of social and cultural evils than benefits.	-3	-1.09
38)* I can hardly look forward to future Internet developments because I'm still struggling to figure out what is available now.	-3	-1.11
34)** Two separate Internets would be great, so you'd have like line for "adult" violent or pornographic material and a regular line.	-3	-1.14
5)** I am on the Internet more than anyone I know. I have to cut back on time spent on the Internet.	-3	-1.24
14) When we communicate through e-mail, it's only two machines. I'm not feeling anything. I think we get away from that emotional side of interaction and communication.	-4	-1.36
29) The Internet isolates me from my family members because we cannot interact while one of us is using the Internet.	-4	-1.59
7)* I don't like computers and the Internet. They are a necessary evil.	-4	-2.39

*Note. * distinguishing statement at a significance level of $p < 0.05$; ** $p < 0.01$.*

information found there is not necessarily authoritative (17), and users could not get a response through e-mail as quickly as on the telephone (37). Like the other factors, people in this group were angry about e-mails they didn't need (20). Assimilators did not want to take any drastic systemic measures, such as having two separate Internet systems, to deal with "adult" materials (34).

Factor II: Convenience Users

Seeking instant gratification, Convenience Users move quickly on the Internet; they hop on to get what they want when they want it and then hop out. Three males (38% of total males) and four females (13% of female sorters) were aligned with only this factor, explaining 12% of variance. The seven whites in this group were 19 to 22 years old. Among six Convenience Users who answered the question about the level of their Internet savvy, four (67% of all Convenience Users) regarded themselves as savvy Internet users, two (33%) as non-savvy users.

This factor was significantly different from the other two groups in the sorting of statements 7, 13,18, 35, 36, 37, 40, 41, and 46 as shown in Table 5. Convenience Users wanted to get things done quickly. More than anything, these sorters wished to have better search engines that would speed up Internet use (41). They lamented the sheer amount of information available on the Internet. (18). Rather than shopping on the Internet, they preferred to go and shop directly in the real world (35). Since Convenience Users did not spend much time online, they had no fears of isolation or Net addiction (5). Forgetting the passage of time while being immersed in Internet activities would not happen to them (13). Convenience Users did not use much of the Internet and did not feel they depended on the Internet (36). They did not necessarily dislike new technology (7), but maybe its slowness. When Convenience Users used e-mail, they didn't think of it as a means of communication stripped of human emotion (14). E-mail was OK with these sorters even though it did not get an instant reply (37). Also these sorters did not believe that the Internet increases isolation among users (29). Convenience Users did not like junk e-mail (20), and disagreed on the possibility of impulse shopping (42). Unlike the other two groups, this group had faith in information on the Internet (40) and worried about potential havoc like Y2K (46).

Factor III: Reluctant Users

Reluctant Users are people who prefer real-life experiences to the virtual ones offered on the Internet. Five sorters — one male (13% of total males) and four females (13% of female sorters) — were aligned with only this factor, explaining only 10% of variance, the smallest among the three factors. All five whites were between the ages of 19 and 21. Among the five Users, three (60%

Table 5. Convenience Users: High Salience Statements

Statement	*Score*	*Z-score*
41)* In the future, I most look forward to better search engines that will help me find what I want to find and not give me 40,000 results from one word.	4	2.09
37)* E-mail is OK with me even though I don't get the instant reply I do with a phone call. I still feel connected to people.	4	2.09
18)** I sometimes think the Internet will drive me crazy, because I get an overwhelming amount of information from it.	4	1.97
20) People e-mail me with stupid stuff. It can be a waste of my time.	3	1.64
46)** If something like Y2K were to happen to the Internet, the whole country would be in chaos until things are straightened out.	3	1.11
40)* I kinda have faith in the information I receive from the Internet.	3	1.04
35)* It's just easier to call or go shop to look for what I want, instead of getting on the Internet and taking an hour to look at everything.	3	1.02
13)** Sometimes I don't even realize how long I've been online until I look at the clock.	-3	-0.96
42) It's easy to spend money online. I am afraid of being bankrupt because of my impulse shopping.	-3	-1.35
36)** I use the Internet a lot, and I may now be dependent on it. But I think of the Internet now as just part of my daily life.	-3	-1.37
29) The Internet isolates me from my family members because we cannot interact while one of us is using the Internet.	-3	-1.55
14) When we communicate through e-mail, it's only two machines. I'm not feeling anything. I think we get away from that emotional side of interaction and communication.	-4	-1.62
7)* I don't like computers and the Internet. They are a necessary evil.	-4	-1.96
5) I am on the Internet more than anyone I know. I have to cut back on time spent on the Internet.	-4	-2.06

*Note. * distinguishing statement at a significance level of $p < 0.05$; ** $p < 0.01$.*

Table 6. Reluctant Users: High Salience Statements

Statement	*Score*	*Z-score*
6)** I like to go out and do things. I have to have social interaction. I fear that the Internet holds us back from that.	4	1.88
17) I don't think the Internet is the final authority on information. I take the Internet as one of many sources of information.	4	1.83
20) People e-mail me with stupid stuff. It can be a waste of my time.	4	1.65
21)* I'm pretty much done with the Internet at work or school; I'd rather watch TV or interact with my family or friends during non-work time.	3	1.57
35)* It's just easier to call or go shop to look for what I want, instead of getting on the Internet and taking an hour to look at everything.	3	1.52
13)* Sometimes I don't even realize how long I've been online until I look at the clock.	3	1.45
18)** I sometimes think the Internet will drive me crazy, because I get an overwhelming amount of information from it.	3	1.18
1)** I don't verify Internet information because I usually only check stock quotes, scores and general stuff that can be found through many media sources.	-3	-1.08
28)** In regard to spending too much time online, I don't think going online is any different from any other interest. Some people may spend too much time reading, listening to music or cooking.	-3	-1.11
2)** When I search, I put in a keyword and many things will come up. I end up reading all the different things that catch my interest to see what they are about.	-3	-1.24
42) It's easy to spend money online. I am afraid of being bankrupt because of my impulse shopping.	-3	-1.64
15)** I don't think the Internet has made people impatient.	-4	-1.84
4)** I am comfortable with buying things on the Internet, and don't mind giving my credit card information online.	-4	-1.89
5) I am on the Internet more than anyone I know. I have to cut back on time spent on the Internet.	-4	-2.03

*Note. * Distinguishing statement at a significance level of $p < 0.05$; ** $p < 0.01$.*

of all Reluctant Users) regarded themselves as savvy Internet users, and two (40%) saw themselves as non-savvy users.

Reluctant Users were significantly different from the other two groups in the sorting of statements 1, 2, 4, 6, 13,15, 18, 21, 28, and 35 as shown in Table 6. This group liked face-to-face interaction with other people and had a fear that the seductive power of the Internet might change their lifestyle. Reluctant Users did not view online experiences the same as real-life experiences (28). This group's characteristics are well reflected in the statement the group strongly agreed with: "I like to go out and do things. I have to have social interaction. I fear that the Internet holds us back from that" (6).

Unlike the other two groups that most strongly denied that computers and the Internet are a necessary evil (7) by assigning a rank score of -4, the denial of Reluctant Users was much milder by giving -2. Actually, Reluctant Users saw plenty about the downside of the Internet. Reluctant Users were irritated with the abundance of information available online (18) and thought that the Internet has made people impatient (15). Members of this group agreed that it is easier to call or go shop to look for what they want, instead of relying on the Internet (35). Reluctant Users might be forced to use the Internet at work or school, but during their personal time they would rather watch TV or interact with their family or friends (21). This group, of course, disagreed on Internet use for shopping (4, 42). Like Assimilators, Reluctant Users did not believe the Internet is the final authority for information (17) and they did not like junk e-mail (20). This group would not be led into reading all the different things that pop up on the Internet with a non-discriminatory keyword search (2).

This group probably spent the least time on the Internet, since its members most strongly denied the statement, "I am on the Internet more than anyone I know. I have to cut back on time spent on the Internet" (5). Yet they are not immune to the seduction of the Internet in terms of time out of control. The group assigned a strongly positive score for the statement: "Sometimes I don't even realize how long I've been online until I look at the clock" (13).

Rank scores on the purposes of Internet use

Table 7 presents the factor ranks assigned by persons to the purposes for which they used the Internet. Communication was indicated as the most important reason; transactions the least, and others in between. Assimilators and Convenience Users kept the same pattern, although Assimilators emphasized the importance of communication a little more than Convenience Users. From inspection of category ranks, one can infer that Reluctant Users use the Internet in ways that are different from the other factor definers. Reluctant Users put gathering information prior to communication, and rank entertainment higher than gathering news.

Table 7. Average Rank scores on the purposes of Internet use

	Communication	*Information*	*News*	*Entertainment*	*Shopping*	*Transactions*
Assimilators	1.7	2.2	3	4.1	4.9	5.3
Convenience Users	2	2.2	3	3.8	4.5	5.5
Reluctant Users	2.3	1.5	3.3	3	5.5	5.5
All	1.8	2	3.1	3.9	4.8	5.4

Each respondent ranked (from 1 to 6) the importance of several reasons for using the Internet, assigning 1 for the most important reason to 6 for the least important reason.

Discussion and conclusions

As diffusion theorists suggest, people respond differently to the technology of the Internet. Assimilators, the largest group, embraced the Internet (33, 36), but were not blindly loyal (17); they understood its limitations (37). Convenience Users, the second largest group, denied the concept of technology as a necessary evil (7) as did Assimilators, but showed a less enthusiastic attitude toward its benefits (31). While Assimilators found the opportunities of a virtual community of support and information via the Internet (39), Convenience Users showed a tepid response to the incorporation of the Internet into their life (36), although they did not criticize nor were they intimidated by the Internet (14, 29). Convenience Users displayed less passion than did Assimilators about the use of the Internet, although Convenience Users sought instant gratification, which they rarely found. They wanted to get things done quickly, but the Internet technology has not come to the level yet at which their needs could be met immediately.

In contrast, Reluctant Users, the smallest group, put more value on real-life experiences than virtual ones and did not seem to acknowledge the full benefits of technology (31). No group in this study rejected technology outright as Luddites, who think technology is truly evil (7).

Members of these three groups are not Internet addicts. Assimilators did not spend more time online than anyone they knew, even though they felt they might be dependent on it. Reluctant Users and Convenience Users could not be Internet addicts, since they did not accept the Internet as an integral part of their lives (36).

However, among those who did not belong to any of these three groups, one or two people could possibly be classified as Internet addicts. For example, one respondent wrote: "When I am online, I tune out and when

people are talking to me, I don't hear them. ... Every day I turn on my computer, check the weather and later I talk to people online. A lot of information comes to me through e-mail, too." This individual did not see computers and the Internet as necessary evils, but just machines, and even acknowledged, "They do run our lives at times." This study did not include enough specific statements about Internet addiction, to state with any conviction that a certain person should be categorized as "addicted," even though it was suggestive.

There was no hint of the Internet bringing isolation to respondents. Assimilators and Convenience Users acknowledged that e-mail fostered connectedness with other people (37), and they denied that it had any isolating effect (29). True to their factor, Reluctant Users did not find the Internet isolating since they did not rely on the Internet for communication.

Large, pressing societal issues were rarely salient among the Elon Internet project participants in a discussion of their uses of the Internet. Other democratizing issues were also not salient among any group of Q sorters in this study (8, 16).

Some Q sorts seemed surprising. For example, Convenience Users had stronger faith in information on the Internet than did others (40). This might result from their lack of knowledge of the Internet, or hastiness might make them accept information on face value rather than taking time to check it. Reluctant Users in this study appear to use the Internet least, as Kraut and others (1998) predicted by writing "More extroverted individuals subsequently used the Internet less." However, Reluctant Users agreed with the statement: "Sometimes I don't even realize how long I've been online until I look at the clock" (13). This could be interpreted as their fear of being addicted to the Internet (6), rather than a sign of being addicted. Or, perhaps more likely, it could be that they too become totally absorbed by their work and by the numbing rate at which the Internet bombards users with a constantly changing menu of new information.

Assimilators, those who had smoothly adapted the Internet to their life- and work-styles, included more females than males. Males in this group accounted for 25% of all male sorters while females accounted for 56% of all female sorters. In this study Convenience Users, who seek instant gratification, included more males than females (38% vs. 13%). This phenomenon is at variance with a national trend showing that males in general are more likely to embrace the Internet than females (The Pew Internet and American Life Project 2001). The dominance of women among Assimilators can be attributed to Elon's environment where females are much stronger academically than males. Given the access to the Internet and expectations, females could excel males in using Internet technology.

Reluctant Users, the smallest group in this study equally divided between males and females (13%), valued real-life experience over virtual life. Neither age nor race could be assessed as a factor determinant. There were only four black respondents, and all were on the dominant Assimilator factor. Similarly, all respondents were aged 18-23 years. The perceived expertise level seemed to be an important factor determinant. Of the Assimilators, 89% described themselves as savvy users, compared with 67% of Convenience Users and 60% for Reluctant Users. Sorters who felt confident in Internet skills that they honed, perhaps at an office job, were more likely to embrace and use the skills for school and non-school works than others.

Assimilators and Convenience Users ranked the importance of different Internet uses in exactly the same order, and both factors indicated that communication was their primary use of the Internet. Reluctant Users, however, used the Internet more for gathering information than for communication, since they preferred to pursue communication in real life rather than in the virtual world. All three factors ranked purchasing and other financial transactions as their least important uses of the Internet. Older participants might have responded differently.

Limitations and further study

This study may not detect all types of Internet users in society, but it cannot be denied that at least these three types exist in society. Today's college students are generally immersed in a culture in which the expectation is that they will use the Internet actively in some form including such common requirements as research, communication with professors, and registration for courses. They are also more likely than people in the general populace to have free access to computers with high-speed Internet connections and sophisticated databases. Because of this, college students are a select group and do not completely represent even the 18 to 24 age cohort. Any future study should target people from other walks of life for a bigger picture. This study was designed to find the general types of Internet users in the Elon population and to determine why they embrace Internet technology with different intensity and enthusiasm. To understand a particular factor, a deeper, more probing inquiry should address specific issues such as Internet addiction, perhaps through additional Q sorting or focus groups consisting only of individuals on one factor.

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* Note It may be necessary to use a general search engine or a search feature provided by the publishing institution to locate Internet articles when addresses have changed.

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Appendix 1: Rotated Factor Matrix for Three-Factor Solution

ID	*Gender*	*Age*	*Race*	*Level of Internet savvy*	*Factor Loading*		
					1	*2*	*3*
2	m	20	w	n	**0.48**	0.25	0.23
3	f	18	w	y	**0.68**	0.14	-0.12
6	f	19	w	y	**0.67**	0.22	0.17
7	f	19	w	y	**0.49**	0.30	0.08
8	f	19	b	y	**0.69**	0.01	0.06
9	f	19	neither	y	**0.44**	0.35	-0.11
10	f	18	w	no response	**0.55**	0.21	-0.02
13	f	18	w	y	**0.77**	0.25	0.10
14	f	20	w	y	**0.63**	0.37	-0.08
17	f	19	w	y	**0.41**	0.38	0.05
20	f	19	w	y	**0.67**	0.14	-0.15
21	f	19	w	y	**0.59**	0.07	0.08
23	f	20	w	n	**0.50**	0.18	-0.05
24	f	21	w	y	**0.53**	0.11	0.13
25	f	20	w	y	**0.63**	0.15	0.27
28	f	20	w	y	**0.81**	0.13	0.05
30	f	21	w	y	**0.78**	-0.26	0.16
31	f	20	w	y	**0.64**	0.31	0.07
39	f	20	w	y	**0.44**	0.06	0.19
40	m	23	b	y	**0.52**	-0.22	0.11
1	f	19	w	no response	0.02	**0.70**	0.24
12	m	20	w	y	0.32	**0.68**	-0.21
18	f	20	w	n	0.04	**0.47**	0.31
19	m	20	w	n	0.11	**0.77**	0.35
33	m	22	w	y	0.40	**0.42**	0.29
35	f	21	w	y	-0.11	**0.55**	0.32
38	f	19	w	y	0.30	**0.72**	-0.19
15	f	19	w	n	-0.07	0.14	**0.67**
26	m	21	w	y	0.06	0.12	**0.66**
29	f	20	w	y	0.15	-0.06	**0.73**
34	f	21	w	y	0.06	0.08	**0.48**
36	f	20	w	n	0.07	0.17	**0.81**
4	f	19	w	n	**0.51**	-0.04	**0.54**
32	f	21	w	y	**0.44**	**0.50**	0.02
16	f	18	w	y	0.11	**0.55**	**0.53**
5	f	19	w	y	0.37	0.38	0.29
11	f	20	w	y	0.36	0.24	0.21
22	f	19	w	y	0.32	0.13	0.22
27	m	20	b	n	0.33	0.24	0.16
37	m	20	b	n	0.26	0.37	0.07
% of explained variance					22%	12%	10%

Appendix II: Statements and Rank Factor Scores

No.	Statements	Scores by Factor		
		1	2	3
1	I don't verify Internet information because I usually only check stock quotes, scores and general stuff that can be found through many media sources.	-1	1	-3
2	When I search, I put in a key word and many things will come up. I end up reading all the different things that catch my interest to see what they are about.	2	0	-3
3	Pornographic materials on the Internet should be regulated by the government.	-2	-1	-1
4	I am comfortable with buying things on the Internet, and don't mind giving my credit card information online.	0	0	-4
5	I am on the Internet more than anyone I know. I have to cut back on time spent on the Internet.	-3	-4	-4
6	I like to go out and do things. I have to have social interaction. I fear that the Internet holds us back from that.	0	2	4
7	I don't like computers and the Internet. They are a necessary evil.	-4	-4	-2
8	I don't believe the Internet will be used to foster freedom and democracy.	-1	-1	-1
9	I really worry about verifying the information I get online even though I use big-name sites that are brands I can trust.	-1	-2	0
10	I always find what I'm looking for when I use the Internet. It's the biggest library in the world.	2	-2	-1
11	I believe in the free-speech aspect, so kids' access to pornographic materials and harmful sites should be controlled by parents, not by the government.	2	1	0
12	I am unhappy with Internet retailers. My orders were not shipped/confirmed by Internet merchants, or things I wanted to purchase were out of stock.	-2	-1	-2
13	Sometimes I don't even realize how long I've been online until I look at the clock.	2	-3	3
14	When we communicate through e-mail, it's only two machines. I'm not feeling anything. I think we get away from that emotional side of interaction and communication.	-4	-4	2
15	I don't think the Internet has made people impatient.	0	0	-4
16	The Internet exposes people to a multitude of different views, so it will bring about more social fragmentation.	0	0	0
17	I don't think the Internet is the final authority on information. I take the Internet as one of many sources of information.	4	2	4

No.	Statements	Scores by Factor		
		1	2	3
18	I sometimes think the Internet will drive me crazy, because I get an overwhelming amount of information from it.	-2	4	3
19	I fear online companies tracking my Net use: where I am, how long and how often I use it. I am leery of it.	-1	0	1
20	People e-mail me with stupid stuff. It can be a waste of my time.	3	3	4
21	I'm pretty much done with the Internet at work or school; I'd rather watch TV or interact with my family or friends during non-work time.	1	2	3
22	I wish I could vote online in state, local and national elections.	1	2	-2
23	If I had Internet access only at home, not at work, I would feel the money I invested for Internet access at home is money well	1	1	-2
24	There are certain Web sites giving the same meat-and-potatoes information, so you trust 26it. But even though it is repeated, I have reservations about its credibility.	-1	1	1
25	I feel the Internet is a good place to go to get a holistic view on things.	1	-2	-1
26	We can forbid kids from talking to strangers online. They never know who they're talking to – it could be a dangerous adult.	0	2	1
27	People I know are paying bills online and they say it works, but I'm reluctant to do that.	1	0	1
28	In regard to spending too much time online, I don't think going online is any different from any other interest. Some people may spend too much time reading, listening to music or cooking.	0	-1	-3
29	The Internet isolates me from my family members because we cannot interact while one of us is using the Internet.	-4	-3	0
30	The Internet can make you lazy. It will loosen some of your investigative skills.	2	-1	0
31	Technological change brings with it more of social and cultural evils than benefits.	-3	-2	0
32	You can't really completely trust information from the Internet, but you use it anyway. That's what I do.	-1	-2	1
33	I mostly bookmark Web sites I frequently visit, so I could get quick access to them.	3	0	0
34	Two separate Internets would be great, so you'd have like line for "adult" violent or pornographic material and a regular line.	-3	0	-1
35	It's just easier to call or go shop to look for what I want, instead of getting on the Internet and taking an hour to look at everything.	-1	3	3

No.	Statements	Scores by Factor		
		1	2	3
36	I use the Internet a lot, and I may now be dependent on it. But I think of the Internet now as just part of my daily life.	4	-3	2
37	E-mail is OK with me even though I don't get the instant reply I do with a phone call. I still feel connected to people.	4	4	-1
38	I can hardly look forward to future Internet developments because I'm still struggling to figure out what is available now.	-3	-1	-2
39	The Internet will provide a virtual community of support and information.	3	1	0
40	I kinda have faith in the information I receive from the Internet.	1	3	-1
41	In the future, I most look forward to better search engines that will help me find what I want to find and not give me 40,000 results from one word.	3	4	1
42	It's easy to spend money online. I am afraid of being bankrupt because of my impulse shopping.	-2	-3	-3
43	I can't pick up your tone when it comes to talking through a chatroom. I get all this information, all this cold data.	0	1	2
44	The Internet runs really slow, and I just have to sit there, waiting on it. This may be something that keeps me off the Internet.	-2	1	2
45	It's more comfortable to sit in my den with a book rather than Internet surfing. It is still nice to feel the page.	1	-1	2
46	If something like Y2K were to happen to the Internet, the whole country would be in chaos until things are straightened out.	0	3	1