

# Adolescents' Perceptions Toward the Internet: A 4-T Framework

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## ABSTRACT

This study could be viewed as one of the initial attempts to probe adolescents' general perceptions toward the Internet. Through interviewing 40 adolescents in Taiwan, this study found the following 4-T categories for interpreting their perceptions toward the Internet, which included Technology, Tool, Toy, and Travel. Most adolescents perceived the Internet as a tool, implying that these adolescents, in general, held pragmatic views about the Internet. This paper further proposes a framework to elaborate the 4-T categories. The framework consists of the following two axes: one axis probably shows the ontology of the Internet, ranging from a "product" to a "process," whereas the other axis indicates the perceived feature of the Internet, varying from "functional" to "technical." It is finally suggested to carefully investigate the effects of people's Internet perceptions on their behaviors, as well as psychological and cognitive activities in Internet-related environments.

## INTRODUCTION

THERE IS NO DOUBT that adolescents have become one of the major groups using the Internet. The Internet, for them, is a school subject (perhaps in computer-related courses), and it is also used for educational, entertainment and communication purposes. For example, by the Internet, they may search information for course homework or term projects, participate online games, and remotely join some special interest groups. Many reports have also revealed that some adolescents are viewed as Internet addicts as a result of intensive usage.<sup>1-3</sup> As almost all of the adolescents have some experiences of using the Internet, it may be potentially interesting to explore their perceptions toward the Internet. This paper proposes that adolescents' perceptions toward the Internet guide some underlying beliefs which are related to their behaviors in the Internet-based environments.

In the past few years, many educators and psychologists have investigated people's attitudes toward computers or toward the Internet.<sup>4-10</sup> This line

of research has viewed the attitudes toward computers or the Internet as an important factor in the acceptance and usage of the technology.<sup>11,12</sup> The attitudes often include people's affection, perceived usefulness, control and behavior toward computers or the Internet.<sup>6,13</sup> This study was conducted to explore a more fundamental issue, that is, people's (i.e., in this study, adolescents') general perceptions toward the Internet, as this paper suggests that the perceptions shape adolescents' attitudes and then their behaviors when using the Internet.

The method used in the present study was also different from those conducted by numerous attitude-related studies. Research studies exploring people's computer or Internet attitudes often utilized paper-and-pencil questionnaires, scales, or surveys to collect their views. However, as the present study was pilot in nature, the interview method was used. In addition, the interview method can also provide richer and deeper ideas about research participants' views. By conducting individual interviews with forty adolescents in Taiwan, the purpose of this study was to explore their perceptions toward the Internet.

## MATERIALS AND METHODS

### *Subjects*

The sample in this study included 40 10<sup>th</sup> and 11<sup>th</sup> graders (20 males and 20 females) in Taiwan. These adolescents came from four high schools, across different demographic areas in Taiwan. For each participating school, a total of 10 adolescents with various academic backgrounds were selected for interviews about their perceptions toward the Internet. All of these adolescents had prior experience of using the Internet.

### *Data collection*

The research data were collected by interviewing the selected adolescents. Each adolescent was interviewed individually by a trained researcher. The interview was conducted around a guiding interview question, such as "In your view, what is the Internet?" or "What do you mean by the Internet?" In order to acquire a neutral description about each adolescent's perceptions toward the Internet, the interview question was as simple as possible to help him/her freely express his/her ideas. All of the individual interviews were tape-recorded. The interviews were conducted in Chinese and then fully transcribed for further analyses. The verbatim transcripts of adolescent interviews were the main data used for analyzing adolescents' perceptions toward the Internet. (The interview responses presented later in the paper were translated by the author.)

### *Data analysis*

The analysis of the verbatim transcripts of adolescent interviews was conducted by a revised method similar to the phenomenographic method.<sup>14,15</sup> The researcher, first, reviewed each adolescent's ideas expressed during the interview. Then, the researcher underlined some important sentences and marked some keywords that characterized each adolescent's perceptions toward the Internet. For instance, the researcher selected the following sentences that were perceived as the most important to describe one adolescent's perceptions toward the Internet: "The Internet is an amazing tool for many purposes. It is a medium for delivering and acquiring information. It is also a medium to connect each other. Sometimes, it is like a treasure for us to explore a variety of information." The researcher underlined some keywords such as "tool," "medium," and "connect" that characterized the adolescent's main perceptions about the Internet. By comparing the

sentences underlined from the interview transcripts, the content specific similarities and differences between adolescents' interview replies about their perceptions were explored and summarized. Finally, the researcher constructed some categories of description that were used to classify the perceptions toward the Internet expressed by the adolescents. The categories developed were used to exemplify the adolescents' perceptions. In order to best describe their ideas, these categories were revised several times during the process of data analysis.

## RESULTS

### *Category 1: The Internet as a technology*

Many adolescents viewed the Internet as a technology, making our life more advanced. Some typical responses are presented below.

S3: The Internet is a technology. This technology makes the society more modern.

S13: The Internet is a new technology. It helps our life.

S22: The Internet is a technological product . . . It is a very hot issue in contemporary society.

S35: There is no doubt that the Internet is a technology. It changes the ways of life.

### *Category 2: The Internet as a tool*

Students in the second category viewed the Internet as a tool for acquiring information, communication and trade. For example, students had the following responses:

S1: The Internet is a tool for people to do a lot. Through the Internet, people can communicate, obtain information and buy everything.

S14: The Internet is a useful tool for searching information. People can acquire a lot of information and knowledge via the Internet. When I have something unknown, I usually get on the Internet to search relevant information . . . In many cases, (by the Internet) I gradually understand something I did not know before.

S26: The Internet is a tool for communication. I often use E-mails, online chat rooms and MSN to connect with friends, classmates and others.

S33: The Internet contains a variety of information. The information is cutting edge and updated. I obtain a lot of new information on the Internet.

S35: The Internet is an amazing tool for many purposes. It is a medium for delivering and acquiring information. It is also a medium to connect each other. Sometimes, it is like a treasure for us to explore a variety of information.

S40: The Internet is a tool for me to check a lot of information. For instance, I can check the schedule of trains. In addition, it is a useful tool for me to order tickets for baseball games or movies.

The interviews with these adolescents also revealed an important finding required for particular attentions. That is, almost all of them perceived the Internet as a useful tool for searching and acquiring information. However, none of them mentioned about the importance of examining the information obtained from the Internet. Recent research also found that people rarely verified Internet-based information and believed in its credibility.<sup>16</sup> Educators and researchers may need to find more ways to guide people, particularly adolescents, to carefully assess the information acquired from the Internet.

#### *Category 3: The Internet as a toy*

Students in this category perceived the Internet as a source of pleasures, especially for online games. They, for example, stated that:

S7: The Internet, for me, is a kind of pleasure. Its major purpose is to play some on-line games. The online games are more attractive than traditional computer games.

S18: The Internet for me is like a toy for entertainment. It is similar to a fancy toy always available to me. In particular, the toy is changing all the times, thus keeping it often interesting and attractive.

S29: The Internet brings me a lot of pleasure, as I usually use it for games.

#### *Category 4: The Internet as a tour/travel*

In the final category, students perceived the Internet as providing a tour or navigation. Their responses are shown below:

S17: When using the Internet, I usually think I am on a virtual tour. The Internet helps me navigate many locations.

S30: The Internet is like a traveling tool. I can (remotely) travel around the world.

S31: The Internet is a technology and tool. It helps me visit many sites, locations, and people. I see a lot via the processes of navigations.

Obviously, the adolescents' perceptions might be overlapped between (or among) these categories. For example, S31's responses above can be viewed as a position across three categories, that is, "technology," "tool," and "travel." It should be noted that the interview transcripts presented above were selectively quoted to represent some typical thoughts for each category. In many cases, each student's interview responses, if shown in full, could be labeled into more than one particular aforementioned category. As another example, during interview, S2 student responded that "although the Internet is a technology, it is a tool for finding information." Therefore, S2's perceptions toward the Internet were coded into both "technology" and "tool" categories. That is, the adolescents might express mixed views across different categories. This situation was also revealed in previous studies, which were also conducted by the phenomenographic method<sup>17-18</sup>. By the method used in this study, the adolescents' perceptions toward the Internet may be classified into more than one category.

One may argue that one important perception about the Internet may not be revealed in this study, that is, the perception of the Internet as a place to socialize. However, it is suggested that this perception should underlie the perception of "tool." As shown previously, some adolescents in the "tool" perception viewed the Internet as a tool for communication with others.

#### *Adolescents' responses across categories*

Table 1 shows adolescents' interview responses as labeled into the aforementioned four categories of representing perceptions toward the Internet. Again, an individual adolescent's perceptions may be classified into more than one category. Such cat-

TABLE 1. ADOLESCENTS' PERCEPTIONS TOWARD THE INTERNET, SORTED BY CATEGORIES (N = 40)<sup>a</sup>

<i>Category</i>	<i>N</i>	<i>%</i>
Technology	16	40
Tool	36	90
Toy	11	27.5
Travel	7	17.5

<sup>a</sup>An individual adolescent's perceptions may be classified into more than one category.

TABLE 2. ADOLESCENTS' POSSIBLE POSITIONS ACROSS THE CATEGORIES OF THE INTERNET PERCEPTIONS (N = 40)

Position	N
(1) Technology-Tool	10
(2) Tool	10
(3) Tool-Toy	7
(4) Tool-Travel	5
(5) Technology-Tool-Toy	3
(6) Technology	2
(7) Technology-Tool-Travel	1
(8) Toy	1
(9) Travel	1

egorization process was conducted by the author, and further validated by a second independent researcher, who actually viewed the verbatim interview transcripts.

The data in Table 1 revealed that most of adolescents (90%) perceived the Internet as a tool. Sixteen among the 40 adolescents viewed the Internet as a technology. The Internet was perceived as a toy for pleasure by eleven adolescents, while seven adolescents viewed the Internet as a process of traveling. Table 2 shows a more detailed analysis about these adolescents' interview responses. These 40 adolescents show nine positions among the four categories of "technology," "tool," "toy," and "travel." The first position, a total of 10 adolescents, had mixed views between "technology" and "tool." Adolescents holding the second position, a total of 10 students, perceived the Internet simply as a "tool." Seven adolescents expressed the third position,

mixed views of "tool" and "toy," while five adolescents held mixed perceptions for "tool" and "travel." Few adolescents showed their views on other positions. Table 2 revealed that many adolescents perceived the Internet as a (technological) tool, or a tool for pleasure or traveling.

Based upon the categories of classifying adolescents' perceptions toward the Internet, this study further proposed a framework to elaborate the 4-T categories (i.e., technology, tool, toy, and travel). The framework consists of the following two axes: one axis likely illustrates the ontology of the Internet, ranging from a "product" to a "process," whereas the other axis indicates the perceived feature of the Internet, varying from "functional" to "technical." The "functional" indicates a more pragmatic view about the Internet, highlighting the practical applications of the Internet. On the other hand, the "technical" expresses a more mechanical and descriptive view towards the Internet. The two axes, then, consist of four major spaces, which roughly respond to the 4-T categories, shown in Figure 1. The adolescents in the "technology" category basically perceived the Internet as a technical product; consequently, the category is largely allocated in the crossing space between "product" and "technical." Because the adolescents showing the "toy" perceptions often viewed the Internet as a tool (thus, "functional") for on-line games (a kind of "product"), the "toy" category is clearly in the space between "product" and "functional." The space between "process" and "technical" is mainly attributed to the "travel" category, since the adolescents in the category perceived the Internet as a technology for the processes of virtual navigations. The

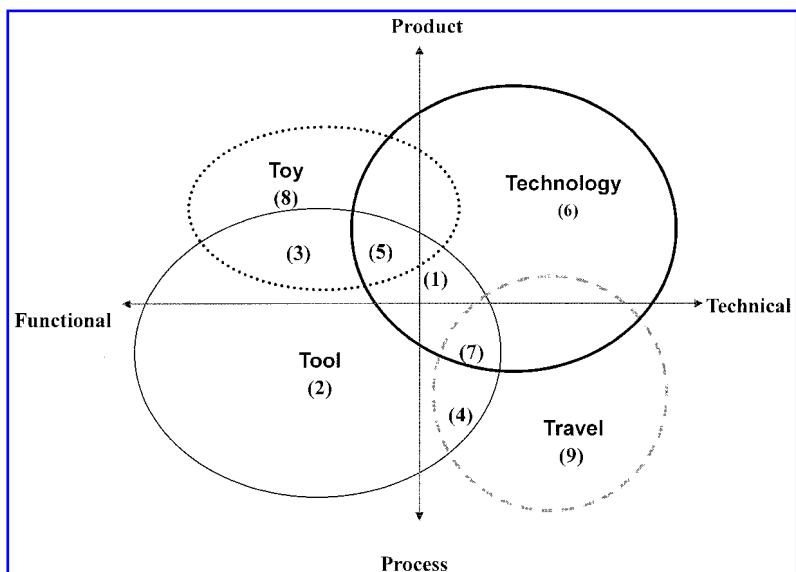


FIG. 1. A framework illustrating the perceptions toward the Internet. Positions of Internet perceptions: (1) Technology-Tool, (2) Tool, (3) Tool-Toy, (4) Tool-Travel, (5) Technology-Tool-Toy, (6) Technology, (7) Technology-Tool-Travel, (8) Toy, (9) Travel.

major category expressed by the adolescents, the "tool," is mainly allocated in the space of "process" and "functional"; however, the "tool" category also shows some merits of "product" and "technical." Therefore, the circle of "tool" is also across other spaces. In addition, the adolescents' positions as revealed in Table 2 can be easily seen in Figure 1. In other words, Figure 1 shows all positions of the Internet positions listed in Table 2. Therefore, the framework as proposed in Figure 1 can be a useful guide for analyzing adolescents' perceptions toward the Internet.

## CONCLUSION

This study could be viewed as one of the initial attempts to probe adolescents' perceptions toward the nature of the Internet. Through interviewing forty adolescents in Taiwan, this study found the following 4-T categories for their perceptions toward the Internet, including technology, tool, toy and travel. Most adolescents perceived the Internet as a tool, implying that these adolescents, in general, held pragmatic views about the Internet. Moreover, still many adolescents viewed the Internet as a technology. This study also provided a detailed analysis of the adolescents' perceptions toward the Internet, and revealed many types of mixed perceptions expressed by them. For instance, many adolescents had mixed perceptions between "technology" and "tool." Also, the perception of "technology" was often accompanied by other perceptions (Table 2). Therefore, "technology" may not be really a distinct perception, and it may be one underlies the other three.

This study further suggested a framework of two axes to elaborate the 4-T categories; one is ranging from "product" to "process" while the other one is varying from "technical" to "functional." These two axes could effectively illustrate the 4-T perceptions toward the Internet.

Researchers are encouraged to base on the initial findings presented in this paper to explore adolescents' perceptions toward the Internet in a larger scope. For example, researchers can collect more interview data to find more categories of Internet perceptions held by adolescents. Or, some questionnaires can be developed to survey a large group of adolescents for their perceptions. In addition, researchers can compare and contrast the perceptions held by different groups of people, for instance, adults versus adolescents, or Taiwanese adolescents versus American adolescents. Through such comparisons, psychologists may gain a better understanding about how cultural, educational and

developmental factors may be related to people's perceptions toward the Internet.

Clearly, another important research question is to carefully investigate the effects of people's Internet perceptions on their Internet-related behaviors and attitudes. That is, research should be conducted to explore in more detail how an adolescent's perception of the Internet is related to what the adolescent does online. The Internet perceptions may shape some guiding beliefs about how to use the Internet and how to behave in the Internet-based environments. The guiding beliefs may be similar to learners' epistemological beliefs shown by educational research.<sup>19-21</sup> For example, educators have found that students' epistemological beliefs of science, that is, their perceptions about the nature of science, are related to their cognitive processes and outcomes in learning science.<sup>22-25</sup> In a similar manner, people's perceptions toward the nature of the Internet may be potentially related to their behaviors as well as psychological and cognitive activities in the Internet-based environments. Also, more information about how adolescents' perceptions toward the Internet develop should be analyzed. In order to acquire a better understanding about this issue, clearly, more research work is necessary.

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