Information commitments and Internet attitudes of nutritional science students and in-service dietitians in Taiwan

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Abstract: This study aimed to explore nutritional science students' and in-service dietitians' information commitments and Internet attitudes toward online nutritional information. The subjects were 340 nutritional science students and in-service dietitians in Taiwan. Two instruments, Information Commitments Survey (ICS) and Internet Attitude Scale (IAS), were used in this study. Results of the study showed that, although students and dietitians with more Internet experience perceived more positively toward Internet's usefulness, they tended to utilize less advanced information commitment standards and less advanced online information searching strategy. No gender difference was found in this study. Significant relations were found between information commitments and attitudes toward Internet. Finally, the in-service dietitians demonstrated more 'Technical' standard and 'Elaboration' searching strategy than did the nutritional science students.

Keywords: Information commitments, Internet attitudes, nutritional science

1. Introduction

Internet technology has become not only an integral part in our life but also used in learning of education for decades [1]. It is common that learners use the Internet to search relevant information and resources to complete their learning tasks. They have been found to use different types of searching strategies to get information from the Internet [2]. They may also set different evaluation standards to assess the accuracy and usefulness of online information [3]. Tsai proposed a theoretical framework describing Internet users' information commitments based on three dimensions: standards for accuracy, standards for usefulness and searching strategies [4]. Wu and Tsai then utilized this framework to assess students' information commitments in Web-based learning environments [3]. Their study found that students' evaluative standards of Web information had a significant effect on their information searching strategies in online learning environment. These two variables seemed to be critical factors for learning in Web-based learning environments.

In addition, Internet attitude is another important factor for online learning. Students with different Internet using experience tended to hold different attitudes toward the Internet [5]. Specifically, students with more Internet experience tended to hole more positive attitude than those with less experience. Tsai, Lin and Tsai [5] developed an instrument, the Internet Attitude Scale (IAS), to assess learners' affection, perceived usefulness, perceived control and behavior of using the Internet. Further research indicated that holding a positive attitude toward the Internet benefits for successful Internet-based learning, as it affects learners' learning motivation, interests and outcomes [6] [7].

It is also very common for future citizens to search information about health and nutrition via the Internet. People may need advanced information commitments and positive Internet attitudes in order to make reasonable judgments and decisions after reading various online nutritional information. However, very limited studies have been conducted to this issue, especially for those who are or will be dieticians. Therefore, this study tried to investigate the information commitments and internet attitudes of those who have nutritional science backgrounds, including students who majored in nutritional science (i.e. pre-service dieticians) and in-service dieticians. To be more specific, the following questions were investigated:

● What are the information commitments and Internet attitudes of nutritional science major students and dieticians?
● What is the role of Internet experience played in their information commitments and Internet attitudes?
● What are the relationships between their information commitments and Internet attitudes?

2. Methodology

2.1 Subjects

Subjects of this study were 340 volunteers, including 289 nutritional science students and 51 in-service dietitians in Taiwan.

2.2 Instruments

To assess nutritional science students' and in-service dietitians' Information commitments and Internet attitudes in web-based environments, two instruments were employed in this study. One is the Information Commitments Survey (ICS) developed by Wu and Tsai [8] and the other is the Internet Attitude Scale (IAS) developed by Tsai et al. [5].

First, ICS had three aspects: standards for accuracy, standards for usefulness and searching strategy, each of which consist two scales. Therefore, the ICS included six scales, named respectively 'multiple sources as accuracy' , 'authority as accuracy' , 'content as usefulness' , 'technical issues as usefulness' , 'elaboration as searching strategy' , and 'match as searching strategy'. All six scales were measured by a six-point Likert scale, ranging from 'strongly agree', 'agree', 'somewhat agree', 'somewhat disagree', 'disagree' to 'strongly disagree'. Overall alpha was 0.80 and these factors accounted for 65.30% of variance. Sample items of the six scales were as follows:

● Multiple sources as accuracy scale (Multiple sources): *"I will discuss with teachers or peers, and then to judge whether the nutritional information which was received from the Internet is correct."*

● Authority as accuracy scale (Authority): *"I will believe in its correctness if the nutritional information appears in government websites."*

● Content as usefulness scale (Content): *"If its content fits my searching goal, I will think the nutritional information is useful to me."*

● Technical issues as usefulness scale (Technical): *"If it does not take much time to be*

retrieved, the nutritional information is useful to me."
- Elaboration as searching strategy scale (Elaboration): *"I can use some acquired information for advanced search to find the most-fit nutritional information."*
- Match as searching strategy scale (Match): *"If I find the first relevant nutritional website, I will not search others."*

Second, the IAS had 18 items which included four subscales: perceived usefulness, affection, perceived control and behavior. All four scales were presented in a six-point Likert scale, ranging from 'strongly disagree' to 'strongly agree'. Overall alpha was 0.81 and these factors accounted for 53.81% of variance. Sample items of the four subscales were as follows:
- Perceived usefulness: *"The Internet helps me acquire relevant information I need."*
- Affection: *"The Internet helps me acquire relevant information I need."*
- Perceived control: *"I need an experienced person nearby when I use the Internet."*
- Behavior: *"I only use the Internet at schools when told to."*

3. Results

3.1 Factor analysis

To clarify the structure, this study used the exploratory factor analysis (EFA) by principle component method as a validation for the ICS. The results of factor analysis revealed that nutritional science students' and the dieticians' responses on the instrument could be analyzed based on the six factors: 'Multiple source', 'Authority', 'Content', 'Technical', 'Elaboration' and 'Match', i.e. all six factors exactly the same as Wu and Tsai`s study [8]. The total variance of the factors was 57.65%. All eigen-values of the six factors amount were greater than one. The reliability coefficients (alpha) of the scales respectively were 0.83, 0.64, 0.71, 0.60, 0.81 and 0.67 (overall alpha is 0.79). These supported the validity and reliability of the six factor surveys as a mean to assess the subjects' nutritional information commitments.

In addition, to validate the instrument of their attitudes toward internet, this study also examined subjects' IAS scores by an EFA. The results also demonstrated good validities and reliabilities under the following four factors: 'Perceived usefulness', 'Affection', 'Perceived control' and 'Behavior', provided in Tsai, Lin and Tsai`s study [5]. The total variance explained by the factors was 58.26%. The overall reliability alpha for IAS was 0.82 and were 0.77, 0.65, 0.61 and 0.62 for subscales respectively.

3.2 Correlation between subjects' background and ICS

In this study, an interesting finding was found regarding the correlations between subjects' Internet experience and their information commitments. it was found that the students' and the dieticians' Internet experience had significantly negatively correlated with 'Multiple sources' (r= -0.12, p < .05) and 'Elaboration'(r= -0.17, p < .01). This indicated that students and the dieticians with higher Internet experiences tended not to utilize advanced evaluative standards, such as 'Multiple sources' as standards for judging online nutritional information and 'Elaboration,' the advanced searching strategy, to search online nutritional information. It also found that their 'Confidence' for learning nutritional

science was negatively correlated with 'Authority' (r= - 0.14, p < .05). This indicated that, though they had high 'Confidence' for learning nutritional science, they tended not to utilize advanced standard for usefulness, such as 'Content' information commitment. However, their 'Interest' for learning nutritional science had not any significant correlation with all the ICS scales.

3.3 Correlation between subjects' background and IAS

This study also found a positive correlation between subjects' Internet experience and their Internet attitude regarding perceived usefulness. The students and in-service dieticians with higher Internet experience for learning nutritional science had higher scores in their responses on 'Perceived usefulness' of IAS (r=0.12, p < .05). This means that students and in-service dieticians with higher Internet experience tended to perceive the online nutritional information was useful. Also, it was found that their 'Confidence' for learning nutritional science was positively correlated to 'Perceived usefulness' of IAS (r=0.12, p < .05). It indicated that students and in-service dieticians with higher confidence in learning nutritional science perceived more about the usefulness of online nutritional information. However, their 'Interest' for learning nutritional science had no significant correlation with all the IAS scales.

3.4 Correlation between ICS and IAS

Table 1 shows the results of correlations between ICS and IAS scores. First, all sub-scores in IAS were significantly positive correlated with Elaboration strategy and significantly negative correlate with Match strategy. This means that the subjects with better Internet attitudes tended to use better strategies to search online information. Second, there were significantly positive correlation between all IAS sub-scores and Content score of ICS. This indicated that subjects with better Internet attitudes tended to evaluate online nutritional information's usefulness majorly by content. Third, regarding the accuracy standards, the subjects with higher usefulness and behavior scores of IAS tended to judge online nutritional information based on both multiple sources and authority. However, the ones with higher affections of Internet tended to judge information by only authority; and the ones with higher perceived control of Internet tended to use multiple sources for evaluation standards.

Table 1: The correlation between subjects' scores on the ICS and IAS (N=340)

	Multiple sources	Authority	Content	Technical	Elaboration	Match
Perceived usefulness	0.36***	0.32***	0.42***	0.21***	0.37***	-0.22***
Affection	0.08	0.13*	0.19***	0.05	0.11*	-0.25***
Perceived control	0.32***	0.07	0.21***	0.02	0.39***	-0.36***
Behavior	0.13*	0.16*	0.24***	0.01**	0.20***	-0.39***

*p < .05, ** p < .01, *** p < .01

3.5 Comparisons between pre-service and in-service dieticians

Comparisons between students and the dieticians in this study showed significant

differences in terms of their scores on the 'Technical' ($t = -3.83$, $p<0.01$) and 'Elaboration' ($t = -3.85$, $p<0.01$). It indicated that in-service dieticians were more oriented to use the 'Technical' standard and 'Elaboration' strategy than pre-service dieticians when searching nutritional information on the Internet. Besides, there was no significant gender difference on the scales of the ICS and IAS with all of their responses scores. This indicated that male and female students or in-service dieticians had similar on-line nutritional information commitments and the Internet attitudes.

4. Conclusion

This study used two instruments to assess nutritional science students' and in-service dietitians' information commitments and Internet attitudes. By exploratory factor analysis, the ICS and IAS are deemed to be sufficiently reliable in assessing subjects' information commitments and Internet attitudes. Liang and Tsai found that medical students with more Internet experience tended to use 'Elaboration' searching strategy while inclining towards utilizing quite 'mixed' standards for judging online information [1]. However, this study revealed that the nutritional science students' and in-service dietitians' Internet experience were negatively related to 'Multiple sources' scale and 'Elaboration' scale of the ICS, and positively related to 'Perceived usefulness' scale of the IAS. This means that respondents with more Internet experience tended to utilize less advanced standards for correctness and searching strategy, but tended to have positive Perceived usefulness about the Internet attitudes. Their confidence for learning nutritional science was negatively related to 'Authority' of the ICS, and tended to have more "Perceived usefulness" of Internet attitudes. It also found that the nutritional science students and in-service dietitians with better Internet attitudes tended to use advanced online information search strategy, to perceive Internet's usefulness majorly according to the content provided on the Internet, and to judge online nutritional information on a mix standard (based on both multiple resources and authorities). Furthermore, there were some differences regarding ICS between in-service and pre-service dietitians. That is, the in-service dietitians tended to use 'Technical' standard for usefulness and 'Elaboration' searching strategy more than did the nutritional science students. Finally, future studies can be conducted to compare the information commitments about online nutritional information and Internet attitudes between students with and without nutritional backgrounds.

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