The impact of socio-demographic factors on web credibility assessment

Mahdi Zeynali-Tazehkandi (iD)
Department of Library and Information Science, Ferdowsi University of Mashhad, Iran

Mohsen Nowkarizi (iD)
Department of Library and Information Science, Ferdowsi University of Mashhad, Iran

Zahra Moradi-Biyarajmandi
Department of Library and Information Science, Ferdowsi University of Mashhad, Iran

Abstract

The aim of this study is to investigate the relationship between web credibility evaluation and socio-demographic variables. A sample of 380 students from Ferdowsi University of Mashhad, Iran, was selected using stratified sampling methods. Data was collected through a questionnaire encompassing socio-demographic information and Choi items. The collected data was analysed using Spearman and Kruskal–Wallis non-parametric tests, guided by the data's characteristics (type and distribution). The findings reveal a significant association between interest, experience and academic level in determining web credibility assessments. Conversely, expertise, income, gender and age were not found to be influential factors. This is a first attempt to determine the impact of socio-demographic variables on web credibility assessment. The findings suggest that individuals from diverse age, gender and income groups could benefit from acquiring knowledge pertaining to web credibility and engaging in workshops related to this domain. Additionally, those with lower levels of experience, education and interest may derive greater value from participating in web-credibility-evaluation workshops.

Keywords

Web credibility evaluation, online trustworthiness, information literacy, information seeking, online retrieval

Introduction

The emergence of the Internet and the World Wide Web has led to extensive evolutions in information resources and their use. These changes have resulted in the rapid distribution and ease of access of information, but the existence of such an immense amount of information has made it difficult to sufficiently recognize the credibility of web resources. In other words, in today's dynamic environment, people are naturally compelled to accurately distinguish credible from less credible information in the web environment to meet their information needs, and this depends on many diverse factors, such as personality traits (Keshavarz et al., 2023), socio-demographic aspects (Baumgartner and Hartmann, 2011; Miller and Bell, 2011), information characteristics (Dutta-Bergman, 2006) and the purpose of information seeking (Kostagiolas et al., 2014; Powell et al., 2011).

The credibility of information resources has long been a subject of interest among scholars and researchers. As Hovland and Weiss (1951) explored the concept of the believability of messages and their relationship to their source. Choi (2015) dates the origins of credibility back to the time of Aristotle, who identified key factors such as ethos (trustworthiness), logos (logic) and pathos (emotional appeal) as essential for establishing credibility. In addition, evaluating information is the sixth and final stage of the Big Six Information Literacy Model (Eisenberg, 2008). Similarly, information resources evaluation has been

Corresponding author:
Mohsen Nowkarizi, Department of Library and Information Science, Faculty of Education and Psychology, Ferdowsi University of Mashhad, Mashhad 9177948974, Iran.
Email: mnowkarizi@um.ac.ir

highlighted in the six standards of information literacy outlined by the Association of College and Research Libraries, as well as in the five Information Literacy Competency Standards for Higher Education (Knapp and Brower, 2014). In this context, Toth and McClure (2016) suggest that information credibility evaluation is a subset of information literacy. Similarly, Pariera (2012) considers web credibility assessment to be synonymous with information literacy on the Web. Therefore, it is evident that web credibility evaluation has been introduced in the information literacy literature using related terminology. However, it was not until the 2000s that the study of web credibility emerged as a distinct area of research (Sbaffi and Rowley, 2017). In response to the proliferation of online information, Google has undertaken several initiatives to assess the veracity of statements presented on websites (Dong et al., 2015). However, Wathen and Burkell (2002) point out that credibility is a multifaceted notion, which is influenced by a confluence of factors, including the source, message and recipient. They further emphasize the role of presentational media in shaping a user's perception of credibility. Reflecting this sentiment, Ahmad et al. (2010) underscore the impact of user skills, experience and, particularly, computer expertise on web credibility judgements. However, they acknowledge the inherent challenges experienced by users in evaluating information independently, especially without expert guidance. In conclusion, aligning with Shah et al. (2020), it is evident that the significance of web credibility has increased in recent times.

Previous studies have revealed that when users perceive information to be credible, they are more likely to share it with others and incorporate it into their own thinking. This, in turn, can have a significant impact on the dissemination of information and the way it is processed. Many studies have been carried out on web credibility evaluation (Choi, 2020; Metzger et al., 2015b; Pariera, 2012). However, there is a gap in the literature on how socio-demographic factors – such as interests, expertise, education level, income, gender and age – influence web credibility evaluation. This study aims to address this gap by examining the correlation between these factors and web credibility evaluation. The findings of this study can be used by website designers, content producers and librarians to develop more effective strategies for providing credible and valuable information for their users.

Literature review

This section presents an overview of the research conducted on web credibility evaluation in recent years.

Web credibility

For many years, the concept of web credibility has been a topic of interest for scientists and researchers. In this regard, Choi (2015) believes that the concept of information resource credibility can be traced back to Aristotle, who discussed various components of it. Additionally, information resource credibility refers to the character of the speaker (e.g. the author or publisher). However, the concept of web credibility has been the subject of much debate in recent years (Choi and Stvilia, 2015; Lazar et al., 2007; Sbaffi and Rowley, 2017). To compare web credibility with traditional information resources, Schweiger (2000) conducted a survey of 540 participants. Similarly, Kiousis (2001) investigated people's trust, or lack of trust, in television, newspaper and online news. A cross-sectional survey of 818 residents of Austin, Texas, was conducted to assess people's attitudes towards these three media. The analysis additionally included factors that affect the perception of news credibility, such as the type of media and interpersonal discussion. The findings show that people trusted newspapers the most, then online news and television news. In another study, Fogg et al. (2001) investigated the impact of different website elements on the credibility of websites. Their study included 1400 residents from the USA and Europe, who evaluated 51 different website elements. The findings indicate that some elements enhanced but others diminished the perception of web credibility. Elements such as the feeling of being in the real world, ease of use, expertise and reliability increased credibility from the perspective of the participants; however, two elements – implications and amateurism – reduced the credibility of websites.

Regarding perceived online credibility, Wathen and Burkell (2002) propose a multifaceted model that includes four components: the source, the receiver, the message and the environment. They argue that these components interact with each other to affect our perceptions of the credibility of information online. On this point, Fogg et al. (2003) investigated the factors that contribute to the perceived credibility of health websites. They found that the appearance of a website, including its design, layout and the use of colour, remained a crucial factor in influencing perceptions of credibility. Using a different approach, Hong (2006) conducted an analysis of 200 websites to identify the features that are associated with high perceived credibility. He found that institutional domain names, which indicate that a website is hosted by an organization such as a university or government

agency, were the strongest predictors of credibility. Flanagin and Metzger (2007) examined the perceived credibility of websites from multiple sources, including news organizations, personal websites and commercial websites. They found that news organization websites were typically perceived as more credible than personal websites or commercial websites. These studies suggest that people have various levels of trust in different types of media, and that this trust is shaped by a variety of factors, including the appearance of a website, the source of the information, and the depth and complexity of the content.

The framework proposed by Hilligoss and Rieh (2008) stands out as an integrated framework that provides a systematic approach to evaluating the credibility of information. This framework effectively assesses credibility in various media formats, considering the specific goals and tasks of information seekers. The proposed framework is structured around three distinct levels, each contributing to a comprehensive understanding of credibility assessment. First, the construct level delves into the fundamental principles that shape individuals' perceptions of credibility. It examines how users construct, conceptualize or define credibility based on their personal experiences, knowledge and beliefs. This level recognizes that credibility is a subjective concept, influenced by individual perspectives and contextual factors. Second, the heuristics level focuses on general rules of thumb that individuals employ to make judgements about credibility. These heuristics serve as mental shortcuts, allowing users to assess credibility efficiently and effectively. The framework identifies a range of heuristics, including source credibility assessments, content evaluations and information presentation assessments. Finally, the interaction level bridges the construct and heuristics levels, capturing the dynamic interplay between individual perceptions and heuristic application. It encompasses credible judgements based on specific cues, such as content cues (e.g. accuracy, completeness, bias), source peripheral cues (e.g. author expertise, organizational reputation) and peripheral information cues (e.g. design elements, website appearance). Dochterman and Stamp (2010) conducted an empirical study to investigate how web users perceive and assess the credibility of websites. Employing a focus group methodology, they engaged 16 participants (eight male and eight female) representing a diverse range of academic backgrounds, including undergraduate students, Master's students and faculty members. Each focus group critically evaluated the credibility of three websites, providing insights into the factors that influence web credibility judgements. The

participants' comments were systematically coded into 12 distinct categories encompassing various aspects of website credibility, including strength, page layout, site motivation, domain, cross-checkability, user motivation, content, history, professionalism, site familiarity, process and personal beliefs. The resulting categorization scheme offers valuable insights into the multifaceted nature of web credibility and its diverse influencing factors.

Familiarity with a subject and the information skills of users also represent significant individual characteristics that play a crucial role in understanding the assessment of web credibility. In this context, Lucassen et al. (2013) developed a model that encompasses user familiarity with a topic and information skills. Their model consists of three aspects: user characteristics, information features and surface features. In another study, Choi (2015) introduces a three-dimensional model that includes the operator, content and design. Taking a different approach, Unkel and Haas (2017) conducted an observational study involving 274 participants to examine the impact of credibility criteria on the selection of search engine results. Their findings reveal that among three credibility indicators – source reputation, message neutrality and social recommendations – only source reputation significantly influenced users' choices of search engine results. Agrawal et al. (2018) presented the web content-based credibility model to evaluate web credibility. They assert that credibility assessments, regardless of content, can lead to erroneous conclusions. Another investigation in this domain was conducted by Sun et al. (2019) on consumer evaluation of the quality of online health information and its indicators. This study employed a systematic search methodology in seven electronic databases to identify experimental studies on web credibility evaluation. The study concludes that the completeness of health information on the Internet influenced consumers' assessments of a website's source and credibility.

Interest in Internet topics and web credibility

Numerous researchers have acknowledged the impact of interest on problem-solving behaviour (Lester et al., 1989), learning outcomes (Harackiewicz et al., 2016), political judgements (Lehman and Crano, 2002) and information evaluation (Armstrong and McAdams, 2009; Dutta-Bergman, 2006). Additionally, drawing on the heuristic model of persuasion, when individuals exhibit a strong interest in a message, they tend to expend less cognitive effort in assessing its credibility accurately (White and Andsager, 1991). In light of

this, Fogg (2003) proposes that users consider distinct facets of a website based on their motivations during information seeking. Addressing this issue, Jung et al. (2016) conducted a study to examine the user-perceived credibility of diet and nutrition websites. Data was gathered from 33 students through questionnaires administered at two separate times (pre-test and post-test). Two key factors – prior knowledge and interests – were explored in this study. The findings reveal that content authenticity, regardless of the author's expertise, exerted a substantial impact on the perception of website credibility among individuals with limited prior knowledge. In addition, the results indicate that interest played a significant role in shaping web credibility perceptions. Regarding the relationship between web credibility and interest, Mirsadikov and Muthitacharoen (2022) employed eye-tracking software to record the behaviour of 30 undergraduate students while evaluating the credibility of information. Their findings demonstrate that motivated users engaged in a more thorough evaluation of various credibility criteria, whereas unengaged users perceived websites as more credible without expending significant effort.

Expertise in information technology and web credibility

Expertise in information technology and its relevant subjects are intricately intertwined. As an individual develops knowledge in a specific area, their attention increasingly hones in on pertinent information. They acquire the ability to prioritize what is important, filtering out distractions and focusing on the key details within their field. This allows them to make quicker, more accurate decisions and perform tasks efficiently. On this point, Lucassen et al. (2013) investigated the impact of user characteristics on web credibility evaluation, specifically focusing on the influence of familiarity with the subject and information skills. Their study involved 40 participants with varying levels of information expertise, including high school, undergraduate and graduate students. The participants were tasked with evaluating Wikipedia articles on both familiar and unfamiliar topics. The results reveal that familiarity with a subject significantly influenced the participants' evaluation strategies. Those familiar with the topic primarily focused on semantic features, such as factual accuracy and logical coherence, while those unfamiliar with the topic relied more heavily on superficial features, such as author credentials and website design. Moreover, the participants with higher-level information skills demonstrated greater discernment

in evaluating information quality, consistently aligning their trust with the actual quality of the information presented. Conversely, those with poorer information skills exhibited a weaker correlation between trust and information quality.

Using a survey method, Israel (2016) explored the relationship between familiarity with computer topics and the use and trust of Internet information resources. A survey was administered to 300 undergraduate students, with 98.5% of the respondents affirming that their computer skills positively influenced their reliance on online information sources and their confidence in assessing the credibility of such resources. In a similar vein, Shariff et al. (2017) examined the connection between Twitter news credibility perception and reader characteristics. They first collected a data set of Twitter messages and automatically evaluated their validity. Subsequently, an online questionnaire was distributed to international participants via CrowdFlower, gathering information on gender, age, education, country and perceived news credibility judgements related to specific tweets. The results indicate a significant correlation between academic background and news credibility perception, suggesting that individuals with higher levels of education exhibit a more discerning approach to evaluating the veracity of online information.

Experience (using information technologies) and web credibility

Experience plays a crucial role in shaping attentional processes. Through repeated exposure to specific stimuli or environments, people develop enhanced attentional selectivity. It can also modulate attentional control, with experts demonstrating a superior ability to allocate and sustain attention during demanding tasks (Agam and Sekuler, 2007). The literature highlights the experience-related nature of attention, suggesting that our capacity to focus on something is constantly refined by our interactions with it. As people's experience with information technology grows, their concern for web credibility is likely to rise accordingly. In this regard, Koohang and Durante (2003) examined the influence of age, gender and Internet expertise on the effectiveness of web-based distance education experiences. A Likert-type instrument was developed to gather feedback from participants regarding their perceptions of web-based distance learning activities and assignments, as well as their experiences with a hybrid programme. The study involved 106 undergraduate learners. The results indicate that age and gender

were not significant factors. However, participants with more online experience had a more positive perception of web-based distance education activities and assignments.

To emphasize the impact of computer expertise on the perceived credibility of online content, Ahmad et al. (2010) employed a different approach. They recruited 15 participants with diverse linguistic backgrounds (native English and non-heritage Spanish speakers) for their investigation. Demographic information, such as age, gender, cultural background, computer and web experience, and cognitive style, was gathered from the participants. Subsequently, they were tasked with undertaking various information-seeking exercises. As the participants engaged in the tasks, their activities were recorded alongside eye-tracking data. For each task, the participants were invited to select five websites that were deemed appropriate and then choose the most credible websites from among the five. The findings reveal the significant impact of expertise and computer literacy on the assessment of web credibility. Taking into account different populations, Kwon and Noh (2010) explored the influence of prior experience and age on the perceptions and intentions of adult consumers regarding online clothes shopping. Their study involved 293 American adult consumers (male and female) born before 1964, who participated in a postal survey. The results demonstrate the limited effects of age and overall Internet experience on the perceptions of the adult consumers and their purchasing intentions. In another study, Jozsa et al. (2012) included 17 Hungarian participants, who were classified into three categories based on their total online search time – beginner, intermediate and expert. The findings reveal that higher levels of user experience corresponded to a more refined understanding of web credibility. In fact, intermediate and expert users exhibited a more comprehensive assessment of credibility compared to novice users.

Academic degree and web credibility

In a 2001 study, Fogg et al. explored the influence of education level, alongside various other factors (age, gender, nationality, income and web-usage experience), on individuals' appraisal and comprehension of web credibility. The research involved 1400 participants residing in the USA and Europe, and utilized an online questionnaire as the primary research instrument. The findings reveal that individuals with dissimilar educational backgrounds exhibited distinct evaluations of web information sources. Employing a cross-sectional observational methodology, Atreja

et al. (2008) examined the impact of academic level (one of several variables analysed, including computer proficiency, age and gender) on satisfaction with health-care web education. The study population comprised 17,891 health-care professionals from six hospitals. The research outcomes indicate that education did not significantly impact individuals' satisfaction with web-based educational materials.

Adopting a different approach, Dochterman and Stamp (2010) conducted a study with 629 individuals, who were categorized into three groups: undergraduate students, graduate students and doctoral students. Their findings demonstrate that individuals with higher levels of education (graduate students and professors) exhibited greater attentiveness to aspects recognized as crucial for web credibility (page layout, content, site processes, authority and motivation). In essence, enhanced educational attainment aligns with refined perceptions of web credibility indicators. These findings suggest a positive correlation between educational attainment and the accuracy of web credibility assessment. This may be due to the progressive development of the knowledge and experience of students during their studies, which equips them with the necessary skills to perform various academic tasks effectively.

Income and web credibility

The evaluation of credibility online can be significantly influenced by a user's income. Exploring this point, Johnson and Kaye (1998) employed an online survey to investigate the relationship between income and perceptions of online information credibility. Their study involved 308 web users with an interest in politics, and the findings indicate a minimal effect of income on credibility judgements. In a similar vein, Fogg et al. (2001) utilized questionnaires completed by 1400 residents of Europe and the USA to identify factors influencing website credibility. They observed distinct patterns of credibility evaluation among individuals with high and low incomes.

Cotten and Gupta (2004) adopted a different approach by examining the characteristics of online and offline health-information seekers. Their research population comprised 2817 adults who had sought health information over the previous year. The findings reveal that an increase in income was associated with a higher likelihood of using online sources for health information. Another study has shown that people with lower incomes may place more trust in user-generated content and prioritize accessibility over aesthetics, finding value in forums and social media groups even if they lack the polished

appearance of commercial sites (Livingstone and Hope, 2010). Conversely, those with higher incomes tend to exhibit greater preference for professional-looking websites and sources that adhere to traditional markers of legitimacy (Tugulea and Stoian, 2017). This income-based disparity in web credibility evaluation highlights the importance of considering audience demographics when designing and disseminating information online.

Gender and web credibility

Gender is a fundamental social construct that shapes individuals' perceptions and behaviours. Recent studies have investigated the influence of gender on the evaluation of web credibility. Yang et al. (2013) examined the impact of gender characteristics, name style, profile picture and author location on the perceived credibility of web content among American and Chinese audiences. Their study, which involved the presentation of identical tweets to participants from both cultures, revealed significant gender-based differences in credibility judgements. Oyibo et al. (2016) further explored gender differences in the perceived credibility of mobile websites, utilizing a mixed-methods approach with participants from North America, Africa and Asia. Their results indicate that women exhibited greater sensitivity to user interface changes and were more likely to attribute credibility to websites that had a clean and intuitive design. Adopting a different approach, Yin et al. (2018) delved into the role of cognitive heuristics and gender in predicting microblog information credibility. Employing an online survey, they analysed data from 204 microblog users and found that men relied more heavily on cognitive heuristics, while women were more susceptible to biases in their credibility assessments.

In contrast to these studies, Habiba and Islam (2022) investigated the evaluation of scientific information sources among faculty members of private and public universities in Bangladesh. Their study, which involved an online questionnaire distributed to 987 participants, yielded no statistically significant differences in credibility evaluation based on demographic characteristics, including gender. These findings highlight the nuanced relationship between gender and the perception of web credibility. While some studies suggest gender-based differences in credibility judgements, others indicate no such disparities. Further research is warranted to elucidate the complex interplay of gender, cognitive biases and cultural factors in shaping web credibility perceptions.

Age and web credibility

Researchers have extensively explored the influence of age on information-seeking behaviour, particularly in the context of online health information. In this respect, Miller and Bell (2011) investigated the association between age, trust and search challenges in online health information seeking. Their study, involving 3796 individuals seeking health information, revealed that 64% utilized the Internet for this purpose, with age inversely correlated with Internet usage for health information searches. To explore the credibility evaluation of health information among younger and older adults, Liao and Fu (2014) examined 44 residents of the USA and recognized no significant difference between the two age groups in their evaluation of web credibility.

Employing a different approach, Howe and Teufel (2014) investigated the impact of age and native advertising on the credibility judgement of a news website. Their research, drawing on an online survey, demonstrates that older respondents perceived the website as more credible than their younger counterparts, regardless of the type of advertisement displayed. In a more recent study, Chevalier et al. (2015) delved into the performance of, and time strategies employed by, different age groups in web information searches. Their study, involving 10 young and 10 older individuals tasked with using Google for information retrieval, revealed that the older participants displayed lower accuracy and less efficient search strategies compared to their younger counterparts. Furthermore, the younger participants tailored their strategies to enhance performance, while the older participants maintained the same approach, regardless of the complexity of the search query. To examine the information literacy beliefs and practices of young people in the USA, Metzger et al. (2015a) employed an online survey of children aged 11–17. Their results indicate that young people relied more on the Internet than traditional media and information sources for information retrieval; however, their information literacy levels fell short of the desired standard. With a different approach, Choi (2020) explored the credibility assessment strategies employed by older adults in evaluating online health information. He posits that older individuals face greater challenges in discerning credible health information on the Web. Utilizing semi-structured interviews with 21 adult Internet users in the USA, the study employed a broad typology of web credibility to analyse the findings. It reveals that older adults placed greater emphasis on operator-related credibility cues, such

as the website's domain name and author credentials, than content and design-related cues.

While website design and quality of content are crucial factors in establishing credibility, research suggests that users' socio-demographic backgrounds also play a significant role in how they evaluate online information. This phenomenon can be justified by the concept of mental models, where people assess credibility based on their pre-existing knowledge and experiences. For instance, an older user with limited digital literacy might prioritize a familiar website layout over in-depth source citations when judging trustworthiness. Understanding how socio-demographic factors influence web credibility evaluation is essential for improving information literacy initiatives and fostering a more discerning online environment. In this respect, a diverse range of studies have been undertaken to assess web credibility, each employing distinct methodologies to arrive at their findings. Concurrently, the evaluation of health websites has emerged as a prevalent focus within these investigations. As web-based information resources have assumed a pivotal role in information dissemination, the research community has predominantly comprised individuals from younger generations, owing to their intrinsic familiarity with the Internet ecosystem. Nevertheless, a comprehensive exploration of the multiple facets of web credibility evaluation remains an exigent endeavour. In light of the established background knowledge, the following hypotheses were formulated:

1. A significant correlation exists between user interest and web credibility assessment.
2. Expertise is significantly associated with web credibility evaluation.
3. There is a significant relationship between user experience and web credibility evaluation.
4. There is a significant relationship between educational attainment and web credibility evaluation.
5. There is a significant relationship between income and web credibility evaluation.
6. There is a significant difference in the way men and women evaluate the credibility of websites.
7. There is a significant difference in web credibility evaluation between individuals from distinct age groups.

Methodology

This study employed a survey methodology to gather data from students at Ferdowsi University of Mashhad, Iran.[1] The population for the study consisted of over 25,000 students pursuing undergraduate, graduate and doctoral degrees at the university. To ensure adequate representation, a stratified sampling technique was employed, selecting 383 students from the university as the study sample. This sample size was determined using Krejcie and Morgan's table (Connaway and Powell, 2016), ensuring a representative cross section of the student population.

The necessary data was obtained using a questionnaire.[2] First, the questionnaire gathered socio-demographic information, such as the participants' gender, age, income and computer usage experience, which is presented in Appendix 1. The questionnaire also included Choi's (2015) Web Credibility Questionnaire.

The questionnaire was initially developed by two researchers, who then sought feedback from another expert to identify any potential shortcomings. Based on his suggestions, the questionnaire underwent revisions to address these limitations. Subsequently, it was presented to three assistant professors at Semnan University, and their feedback was also incorporated into the questionnaire. Next, the revised instrument was subjected to scrutiny by a full professor from Shiraz University and an associate professor from the University of Tehran. Their input led to further refinements. Finally, the questionnaire was reviewed by an associate professor at Shahid Beheshti University, who found no apparent issues, thus validating its content.

To assess its comprehensibility for students, the questionnaire was distributed to 15 individuals from diverse academic backgrounds. Their feedback revealed some complex terminology, which was subsequently replaced with simpler and more common words. Additionally, Cronbach's alpha was calculated to evaluate the questionnaire's reliability, yielding a value of .73 and indicating satisfactory reliability.

Following the data collection, the information was compiled in SPSS version 21. The nonparametric Spearman's test was employed to examine correlational hypotheses, and nonparametric Mann–Whitney and Kruskal–Wallis tests served as the tools for evaluating differential hypotheses. Due to the skewed data distribution, detailed information is presented in Table 1. As evidenced by the values in Table 1, all of the variables exhibit statistical significance levels below .05, suggesting a marked departure from the expected normal distribution. Put differently, the data distribution is not normal.

Findings

The components of the web credibility variable (the dependent variable) are presented in Figure 1.

Table 1. One-sample Kolmogorov–Smirnov test.

	Interest	Expertise	Experience	Degree	Income	Gender	Age
N	362	362	362	362	362	362	362
M	2.21	2.15	3.78	1.52	2.9157	1.37	1.54
SD	.78	.74	.81	.71	1.26377	.48	.85
Absolute	.14	.18	.11	.35	.172	.40	.37
Positive	.14	.18	.75	.35	.172	.40	.37
Negative	−.11	−.10	−.11	−.23	−.108	−.27	−.26
Kolmogorov–Smirnov Z	2.79	3.532	2.22	6.83	3.278	7.68	7.04
Asymptotic sig. (2-tailed)	.00	.00	.00	.00	.00	.00	.00

Figure 1 highlights which components students consider most important. In light of this, the design of websites and blogs should take these into account. In line with user preferences, the following components contribute most significantly to the effectiveness of a document: incorporating images relevant to the content; employing an appropriate font size and colour scheme; including an electronic symbol and informing users of any amendments; providing access to the authors' online profiles; and maintaining a high standard of accuracy by eliminating typographical errors. The user ratings for these aspects averaged 4.11, 3.94, 3.91, 3.86 and 3.85, respectively. While some aspects, such as article length ($M = 2.42$) and web-page length ($M = 2.67$), have a minimal influence on credibility, website designers should prioritize criteria that align with user expectations for web credibility.

As illustrated in Figure 1, the study investigated students' perceptions of various components contributing to website credibility. In other word, the question in Figure 1 refer to the items in Chois (2015) questionnaire. Following this analysis, the research hypotheses were tested.

Hypothesis 1. A significant correlation exists between user interest and web credibility assessment

As suggested by previous research, individuals tend to invest more time and effort in understanding and evaluating information that aligns with their interests. This heightened engagement is likely to lead to more critical and nuanced evaluations of the credibility of such information. To assess this relationship, we conducted a correlation analysis between the participants' self-reported interest in information technology topics and their scores on a web-credibility-evaluation measure. The results, as presented in Table 2, indicate a statistically significant positive correlation between interest and credibility evaluation. This finding aligns with the hypothesis, suggesting that individuals

with a greater interest in information technology are more likely to perceive online information related to this field as credible.

A statistically significant correlation was observed between interest in Internet topics and web credibility evaluation ($p = .00$). This suggests a weak positive relationship between the two variables.

Hypothesis 2. Expertise is significantly associated with web credibility evaluation

This hypothesis is based on the notion that individuals with expertise in a particular domain will possess a deeper understanding of the subject matter and consequently employ more refined criteria to assess the credibility of web-based information. It is supported by the findings presented in Table 3.

According to the results presented in Table 3, the test's significance level (.47) exceeds the conventional threshold of .05. As a result, the alternative hypothesis cannot be definitively established.

Hypothesis 3. There is a significant relationship between user experience and web credibility evaluation

Based on the extant literature, it was proposed that individuals with greater computer experience will be more discerning in their assessment of online information sources. This hypothesis, which posits a positive correlation between computer experience and web-credibility-evaluation proficiency, was examined using the data presented in Table 4.

A statistically significant relationship was found between experience in using information technology products and the ability to evaluate the credibility of web content. This finding was supported by a significance level of .00, which is less than the conventional threshold of .05. These results indicate that individuals with more experience in using technology are more
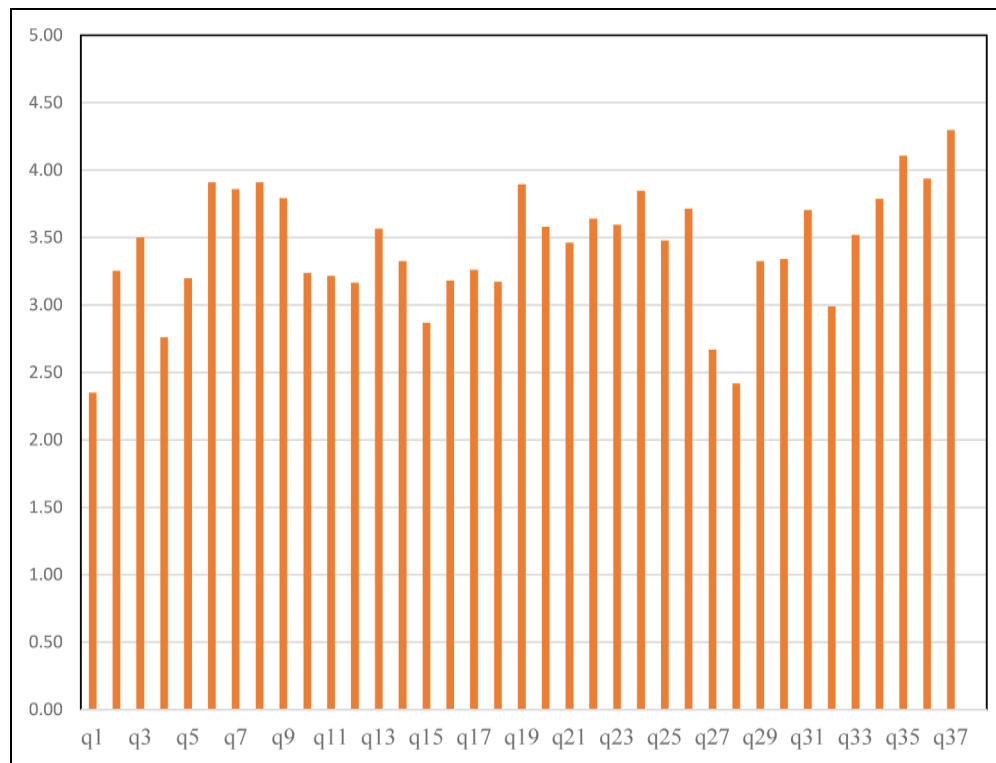
Figure 1. The importance of web credibility components.

Table 2. Spearman's correlation analysis of interest and web credibility evaluation.

		Interest
Web credibility evaluation	Correlation coefficient	.193
	Sig. (2-tailed)	.000
	N	362

Table 3. Spearman's correlation analysis of expertise and web credibility evaluation.

		Expertise
Web credibility evaluation	Correlation coefficient	.038
	Sig. (2-tailed)	.470
	N	362

Table 4. Spearman's correlation analysis of user experience and web credibility evaluation.

		User experience
Web credibility evaluation	Correlation coefficient	.146
	Sig. (2-tailed)	.005
	N	362

likely to possess the skills and knowledge necessary to assess the veracity of online information.

Hypothesis 4. There is a significant relationship between educational attainment and web credibility evaluation

During their academic studies, students are often tasked with completing assignments such as essays and reports, which require them to evaluate the credibility of web sources. As a result, it is reasonable to assume that PhD, Master's and Bachelor's students prioritize different aspects of web credibility. This hypothesis is supported by the results presented in Table 5.

A statistical analysis of the data presented in Table 5 reveals a statistically significant correlation between educational level and web credibility evaluation (correlation coefficient = .125).

Hypothesis 5. There is a significant relationship between income and web credibility evaluation

Income has consistently been shown to be one of the most important factors influencing human behaviour and actions. Therefore, it is reasonable to assume that as a person's income increases, so does their ability to access and evaluate the quality of

Table 5. Spearman's correlation analysis of educational attainment and web credibility evaluation.

		Academic degree
Web credibility evaluation	Correlation coefficient	.125
	Sig. (2-tailed)	.017
	N	362

Table 6. Spearman's correlation analysis of income and web credibility evaluation.

		Income
Web credibility evaluation	Correlation coefficient	−.059
	Sig. (2-tailed)	.260
	N	362

Table 7. Mann–Whitney U test to assess gender differences in web credibility evaluation.

	Web credibility evaluation
Mann–Whitney U	14,849.500
Wilcoxon W	40,274.500
Kolmogorov-Smirnov Z	−.583
Asymptotic sig. (2-tailed)	.560

information on the Web. In support of this hypothesis, we conducted a Spearman's test to measure the correlation between income and web credibility evaluation, which is shown in Table 6.

The significance level of the test in Table 6 exceeds the predetermined threshold of .05, indicating that income does not play a statistically significant role in influencing people's stance on the reliability of web-based content. Consequently, income cannot be regarded as a primary factor influencing individual perceptions of online information credibility.

Hypothesis 6. There is a significant difference in the way men and women evaluate the credibility of websites

Gender is a well-established factor that influences information retrieval and information search processes. Hypothesis 6 assesses whether men and women assign different levels of importance to web credibility criteria. The results are given in Table 7.

As revealed in Table 7, the Mann–Whitney test's significance level (.56) exceeds the conventional threshold of .05. Consequently, the alternative hypothesis is not supported. In other words, there is no statistically significant difference between men and

Table 8. Kruskal–Wallis H test to assess differences in web credibility evaluation across age groups.

	Web credibility evaluation
Chi-squared	2.760
df	4
Asymptotic sig.	.599

women in their methods for evaluating web credibility.

Hypothesis 7. There is a significant difference in web credibility evaluation between individuals from distinct age groups

Social and human science research has consistently emphasized the unique characteristics of different age groups, recognizing that individuals of varying ages exhibit distinct patterns of behaviour and decision-making. To address this hypothesis, we assessed the discrepancy in web credibility evaluation among various age groups, the results of which are presented in Table 8.

According to the data presented in Table 8, the *p*-value of .599 exceeds the significance level of .05. Consequently, the alternative hypothesis is not rejected. Put differently, there is insufficient evidence to conclude that the evaluation of web credibility differs between users of different ages.

Discussion

In today's information-saturated digital landscape, the evaluation of web credibility has emerged as a critical research area. A multitude of factors influence assessments of web trustworthiness, with socio-demographic variables playing a prominent role (Sbaffi and Rowley, 2017). To investigate this connection, a survey involving 362 students was conducted using a questionnaire tool to gauge the association between socio-demographic variables and web credibility evaluation.

Interest serves as a key determinant of human judgement and behaviour (Lehman and Crano, 2002; Mirsadikov and Muthitacharoen, 2022). Based on this understanding, it was hypothesized that individuals with a keen interest in information technology would exhibit a heightened awareness of web-credibility-evaluation criteria. The research findings indeed reveal a significant correlation between interest and web credibility evaluation. This outcome aligns with the conclusions of Jung et al. (2016),

further strengthening the observed link between personal interest and web credibility assessment.

In previous studies, expertise has been identified as a key factor influencing the way individuals assess information (Armstrong and McAdams, 2009; Lucassen et al., 2013). As a result, it is plausible to assume that individuals with greater expertise in a particular domain possess more relevant knowledge, which may extend to their evaluation of web credibility (Israel, 2016). To investigate this hypothesis, we examined the relationship between expertise and web credibility assessment. The results of our study indicate that an individual's level of expertise does not significantly impact their assessment of web credibility. This finding contradicts the results of previous research (Shariff et al., 2017), suggesting that the disparity may be attributed to differences in the study populations.

Experience has been shown to enhance knowledge and alter human behaviour (Ahmad et al., 2010). This rationale underpins the hypothesis that individuals with prior experience in using computers and exploring Internet resources will exhibit a heightened sensitivity to various facets of web credibility. The study's findings corroborate this hypothesis, demonstrating that more experienced individuals can identify a greater array of web credibility criteria and effectively discriminate between credible and non-credible information sources. Notably, this result aligns with the findings of Jozsa et al. (2012) and Kwon and Noh (2010).

Differences in academic level, such as an emphasis on education, research and independent study, contribute to the identification and application of different web credibility criteria. Our findings support previous research by Dochterman and Stamp (2010) and Fogg et al. (2001), which detected a significant relationship between academic levels and web credibility evaluation.

While Fogg et al. (2001) and Cotten and Gupta (2004) found that income level significantly influenced web credibility evaluations, our study contradicts this finding. This discrepancy may be attributed to the distinct populations employed in these investigations. Our study focused on university students, while the aforementioned studies involved diverse participant demographics. However, our result aligns with that of Johnson and Kaye (1998), who also found no substantial correlation between income and web credibility perceptions.

Gender and age have emerged as significant variables in studies examining information evaluation processes (Choi, 2020; Metzger et al., 2015b). Consequently, these factors were incorporated into the present study; however, the findings indicate no significant impact of gender or age on web credibility judgements. This outcome contradicts the conclusions of previous research, such as that conducted by Oyibo et al. (2016) and Yin et al. (2018). It should be acknowledged that while individuals of different genders and age groups may prioritize certain aspects of web credibility, there is no overall disparity in their credibility evaluation processes.

Conclusion

In conclusion, it is recommended that the designers of web information resources, particularly websites and blogs, prioritize the following elements to enhance users' evaluation of credibility: the inclusion of relevant images; the strategic use of fonts, its size and colour; a clear indication of authorship; transparency regarding updates; and meticulous proofreading. These components contribute significantly to the overall credibility of a web information resource in the eyes of users. Furthermore, study of the relationship between socio-demographic variables and web credibility suggests that factors such as interest, experience and education level hold greater significance in web credibility assessment compared to expertise (when not demonstrably shown), age, gender and income. To address this, library and information professionals are urged to organize comprehensive information literacy workshops specifically tailored to women and men across diverse age, income brackets and backgrounds. This approach will ensure that individuals from all walks of life receive equal support in evaluating web credibility. Notably, individuals with lower levels of education, experience and interest should be prioritized for more intensive assistance and workshops in the area of information literacy. This study did not consider a specific context or task, nor did it emphasize a particular issue in the questionnaire design. Researchers are therefore encouraged to consider this issue in future studies investigating the relationship between demographic variables and web credibility evaluation. This kind of nuanced approach could significantly enrich our understanding by showing how different contexts influence the perceived credibility of information.

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ORCID iDs

Mahdi Zeynali-Tazehkandi 🔟 https://orcid.org/0000-0003-2145-2666

Mohsen Nowkarizi 🔟 https://orcid.org/0000-0001-7716-8280

Notes

1. All of the procedures in this study were conducted in accordance with the Ferdowsi University of Mashhad review board's approved protocols (Ref. 61418).
2. The data sets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Author biographies

Mahdi Zeynali-Tazehhkandi is a PhD candidate and research assistant in the Department of Library and Information Science at Ferdowsi University of Mashhad, Iran. His main research interests are the evaluation of information retrieval systems, science studies, and library and information science education.

Mohsen Nowkarizi is a full professor in the Department of Library and Information Science at Ferdowsi University of Mashhad, Iran. He has authored several books and articles in professional and scholarly publications. His main research interests are science studies, human–computer interaction and search engines.

Zahra Moradi-Biyarajmandi is a Master's student in the Department of Library and Information Science at Ferdowsi University of Mashhad, Iran. Her main research interests are information seeking and the evaluation of information retrieval systems.

Appendix I

Socio-demographic information

1. Gender:
2. Age:
   (a) < 23 ☐ (b) 23–26 ☐ (c) 27–30 ☐ (d) 31–34 ☐ (e) 34+ ☐
3. Provenance or state:
4. Income (in million):
   (1) < 5M ☐ (2) 5–10M ☐ (3) 10–15M ☐ (4) 15–20M ☐ (5) 20M+ ☐
5. Academic degree:
   (a) Bachelor's ☐ (b) Master's ☐ (c) PhD ☐
6. Field of study:
   (a) Social sciences and humanities ☐ (b) Natural sciences ☐ (c) Agricultural sciences ☐
   (d) Engineering and applied sciences ☐
7. How closely does your field of study intersect with information and communications technology (ICT) topics such as search engines, websites and social networks?
   (a) very high ☐ (b) high ☐ (c) middle ☐ (d) low ☐ (e) very low ☐
8. If you are working for an organization, to what extent is your job related to the Internet and the Web?
   (a) very high ☐ (b) high ☐ (c) middle ☐ (d) low ☐ (e) very low ☐
9. To what extent are you familiar with the Internet and its search functionalities?
   (a) very high ☐ (b) high ☐ (c) middle ☐ (d) low ☐ (e) very low ☐
10. How long have you been utilizing Internet research tools such as search engines (e.g. Google and Yahoo) and navigating websites?
   (a) < 1 year ☐ (b) 1–3 years ☐ (c) 3–5 years ☐ (d) 5–7 years ☐ (e) 7 years + ☐
11. How interested are you in ICT topics such as social networks and search engines?
   (a) very high ☐ (b) high ☐ (c) middle ☐ (d) low ☐ (e) very low ☐
12. How interested are you in the issues of credibility of various information sources such as books, articles and websites?
   (a) very high ☐ (b) high ☐ (c) middle ☐ (d) low ☐ (e) very low ☐