Understanding Ethics and Quality in Information Literacy: A Multidimensional Approach

María Pinto, Dora Sales, and Rosaura Fernández-Pascual

abstract: Surveys administered to social sciences undergraduates at five universities in Spain measured their belief in importance, self-efficacy, and actual knowledge with respect to information ethics and information quality. The results suggest that students exhibit relatively low levels of self-efficacy regarding ethics and quality. The article concludes with suggestions about how educators can help students cultivate self-efficacy in these areas.

Introduction

The revolution in information and communications technologies has contributed significantly to an exponential growth of information, a characteristic phenomenon of our times. But the current facilities for the creation and dissemination of information sometimes allow the spread of false, malicious, or confusing content, while other information is simply of low quality. There is growing concern in academic environments, therefore, about issues related to ethics and the quality of information. As a specific discipline, information literacy (IL) should ensure ethical values and quality in information by providing students with the skills necessary to achieve them in these post-truth times.[1]

The concept of ethics refers to a moral system of beliefs and behavior. In the case of information, IL should ensure that students know the tenets that oversee information ethics as well as the ethical behavior that both producers and users should practice. Ultimately, ethical issues affect both information processes and products. There are many

examples of ethical issues, from the confidentiality of medical information, to the privacy of personal and tax information, to students' copying and pasting when writing papers.

The issue of quality is also involved in information products and processes. Regarding products, quality refers to the goodness or excellence of the information, whereas regarding processes, quality is more related to user satisfaction. In any case, information, conceptualized by Birger Hjørland as "something that informs somebody about something,"[2] is an abstract, and eminently subjective, entity. Consequently, the appreciation of the quality of information is a complex task. Among students, probably the greatest indicator of quality is the accuracy, and therefore reliability, of the information sources they use.

This article will focus on the individual perspectives of social sciences students. To get an overview of the subject, the research uses the data provided by students in relation to a set of information literacy skills in ethics and quality. It will approach the topic from a multidimensional perspective combining subjective measurements—in this case, motivation—and objective scales—in this case, cognitive skills and knowledge. From the motivational perspective, the study measures the students' belief in the importance of IL abilities in ethics and quality and the students' self-efficacy, their belief in their own ability. From the cognitive side, the authors use a scale of actual knowledge about IL skills. The data obtained will shed light on the degree of linkage between information ethics and information quality skills. Differences in academic degree pursued, year in college, and gender will be analyzed. Stimulation, commitment, and improvement initiatives can also be derived from the analysis.

Literature Review

Information Ethics

For a better understanding of the literature on information ethics, three perspectives will be distinguished: the academic perspective, that of librarians, and the institutional viewpoint.

The Academic Perspective

The unified model of information ethics proposed by Luciano Floridi distinguishes three dimensions of information, depending on the perspective from which it is approached: as a resource, as a product, or as a target.[3] The first refers to the ethical issues of accessibility and accuracy of information. Information as a product refers to variables, among them the issues of intellectual property and plagiarism, directly involved in the ethics of information. Finally, information as a target involves a series of concepts related to the social dimension of information—security of information, freedom of expression, and censorship. Given the breadth of the information ethics concept, this article focuses on one dimension, intellectual property.

The subject of intellectual property is controversial. As stated by Rafael Capurro, "The question of intellectual ownership on the basis of copyright and patenting has been criticized by such initiatives as Open Source and Free Software."[4] Early in the 1980s, Richard Mason referred to the unique challenges faced in the information age:

"Information forms the intellectual capital from which human beings craft their lives and secure dignity."[5] According to Sonia Bodi, "There is ambiguity about ethics, in large part, because there is a weighing and balancing between competing interests; for example, where do the rights of the owner of intellectual property end and where do the rights of a researcher begin?"[6]

Through the notion of moral literacy, Nancy Tuana acknowledges that "someone who is honest would not avoid plagiarizing not because they do not want to get caught cheating, but because it would be in fundamental conflict with their basic values."[7] In the same vein, Kenneth Himma states that foundational issues in information ethics include intellectual property, information privacy, and security. He links the concepts of intellectual property and the value of information: "It seems reasonable to think that we cannot determine . . . intellectual property rights . . . without knowing something about the value of intellectual content."[8]

> . . . foundational issues in information ethics include intellectual property, information privacy, and security.

One of the many topics related to intellectual property is academic integrity. Donald McCabe, Linda Treviño, and Kenneth Butterfield point out that a basic ethical decision faced by university students is "to cheat or not to cheat on their academic work."[9] Another recurrent issue is the accessibility of information. For Toni Carbo and Stephen Almagno, "Many critical issues related to information access and use are misunderstood, inadequately considered, or even ignored."[10] But probably the most abundant literature focuses on issues of open access to information and copyright. George Aulisio refers to the conflict between open access and copyright law: "Many copyright issues are matters of legal interpretation that cannot be determined by an individual or a librarian."[11] Elizabeth Gadd also recognizes this conflict between the restrictions of academics and the goals of open access.[12]

Kay Mathiesen contends that the "focus of an information ethics should be on the values that access states have for human beings." In this regard, the possible clash of interests is observed: "The rights enjoyed by owners of intellectual property involve restricting access to information."[13] Ultimately, a conflict emerges between two ethically positive concepts: intellectual property and intellectual freedom.

The Librarians' Perspective

From an ethical perspective, the librarian stands at the crossroads of intellectual property, intellectual freedom, and corporate social responsibility. While for Rosemary Du Mont "the concept of social responsibility is fundamentally an ethical concept," for Kay Mathiesen and Don Fallis intellectual freedom is "the core value of librarianship."[14] In case of conflict, Fallis acknowledges that "it is not always clear how library professionals should apply these principles to concrete cases."[15]

> From an ethical perspective, the librarian stands at the crossroads of intellectual property, intellectual freedom, and corporate social responsibility.

According to John Budd, the American Library Association (ALA) Library Bill of Rights, mainly devoted to intellectual freedom, "emphasizes censorship while underemphasizing intellectual property rights and patron privacy."[16] The relevance of this topic is reflected in the growing initiatives for its teaching. William Cross and Phillip Edwards found a series of law courses in LIS programs, including one about copyright and intellectual property in relation to information technology.[17] Catherine Foster and David McMenemy uncovered the most popular values in librarianship: "service, privacy, equity of access, stewardship and intellectual freedom."[18]

The Institutional Viewpoint

Many institutions have been concerned with information ethics issues, both nationally and internationally. UNESCO states:

> The knowledge commons is gradually being privatized through law and, more specifically, through the Intellectual Property Rights regime, which dominates knowledge production. The progressive privatization of the production and reproduction of knowledge is evident in the work of universities, think tanks, consultancy firms and publishing. As a result, much of the knowledge we consider a public good, and which we believe belongs to the knowledge commons, is actually being privatized.[19]

The fundamental principles of librarianship promoted by the ALA "guide librarians and library governing bodies in addressing issues of intellectual freedom that arise when the library provides access to digital information, services, and networks."[20] According to the Society of College, National and University Libraries (SCONUL), the organization of academic and national libraries in the United Kingdom and Ireland, information literate people understand "their responsibility to be honest in all aspects of information handling and dissemination (e.g. copyright, plagiarism and intellectual property issues)."[21] According to the Association of College and Research Libraries (ACRL) Framework for Information Literacy for Higher Education, learners developing their information literacy abilities "understand that intellectual property is a legal and social construct that varies by culture."[22] According to the Chartered Institute of Library and Information Professionals (CILIP), information literacy "helps to understand the ethical and legal issues associated with the use of information, including privacy, data collection, freedom of information, open access/open data and intellectual property."[23] However, as Wallace Koehler and J. Michael Pemberton point out, "Where individual rights must yield to the social good is not yet made clear in the ethical codes, and many codes are said to be too vague or too inadequate to provide the necessary guidance."[24]

Information Quality

As for information quality, this article distinguishes between the academic and the librarians' perspectives.

The Academic Perspective

Many academics have expressed concern about the quality of information. The most frequent topics are related to the indicators of quality and its dimensions, its conceptual

framework, and its evaluation. In any case, the link between quality and ethical issues is evident, as expressed by Larry Pace: "Poor quality is unethical."[25]

In 1996, Yair Wand and Richard Wang claimed that a rigorously defined set of quality dimensions in data has its own value.[26] Many authors agree with this view. For example, Holmes Miller takes into consideration 10 dimensions of quality—relevance, accuracy, timeliness, completeness, coherence, format, accessibility, compatibility, security, and validity.[27] According to Randall McClure and Kellian Clink, students need a better understanding of information quality indicators, among them "bias, authorship, or sponsorship; reliability and documentation; credibility and accuracy; coverage and scope; purpose; timeliness; and verifiability."[28] For María Pinto, information quality involves, among other factors, the quality of the information resources, their updating, and knowledge of the most relevant authors and institutions.[29]

Given the quantity and diversity of indicators and dimensions, some authors have been concerned with the creation of a conceptual framework that rigorously supports the building of information quality. Richard Wang and Diane Strong suggest a conceptual framework based on four dimensions of information quality: "intrinsic, contextual, representational, and accessibility."[30] Rosanne Price and Graeme Shanks advocate an information quality framework to describe the form, meaning, and use-related aspects of information.[31] Stuart Madnick, Richard Wang, Yang Lee, and Hongwei Zhu offer an overview of the evolution and current landscape of data and information quality research based on two dimensions: topics and methods.[32] Mona Alkhattabi, Daniel Neagu, and Andrea Cullen suggest a construct of three underlying factors of information quality for e-learning: "intrinsic, contextual representation and accessibility."[33]

From the perspective of evaluation, Yang Lee, Diane Strong, Beverly Kahn, and Richard Wang recommend a "methodology for information quality assessment."[34] Besiki Stvilia, Les Gasser, Michael Twidale, and Linda Smith propose a general information quality assessment framework consisting of "comprehensive typologies of information quality problems, related activities, and a taxonomy of information quality dimensions organized in a systematic way based on sound theories and practices."[35] The model identifies three types of dimensions: intrinsic, relational, and reputational. Quality is also situational. According to Jens-Erik Mai, information quality "can only be assessed and understood from within specific situations and circumstances."[36]

The Librarians' Perspective

Quality also affects the institutions and people involved in information. Megan Oakleaf states that librarians need a series of skills "related to higher education awareness, institutional savvy, collaboration competency, data dexterity, and assessment ability."[37] Likewise, ACRL acknowledges that "elements that affect or reflect on the creation, such as a pre- or post-publication editing or reviewing process, may be indicators of quality."[38] A subject of great interest is the quality of information on the Internet, and in particular the teaching of how to evaluate websites. The point of

> **A subject of great interest is the quality of information on the Internet, and in particular the teaching of how to evaluate websites.**

such teaching is to help students identify information of high quality. In this regard, as opposed to a checklist approach based on a series of indicators (authority, accuracy, objectivity, currency, and coverage) for the evaluation of these sites, Marc Meola proposes a contextual model "that uses peer review, comparison, and corroboration as methods for teaching website evaluation."[39] This model allows reasoned judgments of information quality. In any case, the convergence between information literacy and quality needs more research, as this is an increasingly crucial need.

Some of the literature addresses self-efficacy. For Albert Bandura, perceived self-efficacy consists of "people's beliefs about their capabilities to produce effects."[40] According to Micaela Waldman, "Much research on self-efficacy has focused on the relationship between self-efficacy and academic achievement."[41] For Penny Beile and David Boote, "Perceived self-efficacy is a well-established construct that suggests people are more likely to engage in activities in which they feel efficacious."[42]

The literature on IL has also addressed the concept of belief in importance.[43] Konstantinos Petrides, an advocate of the belief in importance theory, posits: "Personality traits confer on the individual a propensity to perceive convergences and divergences between their belief that they can attain goals and the importance that they place on these goals."[44] The motivational dimensions—belief in importance and self-efficacy—may be equated to those of relevance and confidence in the motivational model ARCS (attention, relevance, confidence, satisfaction).[45]

This research aims to answer the following questions:

RQ1. What are the levels of students' motivation (belief in importance and self-efficacy) and actual knowledge about a set of IL abilities in ethics and quality?

RQ2. Is there an underlying structure that allows the definition of the constructs involved in IL abilities in ethics and quality?

RQ3. Considering contextual factors, such as academic degree, year in college, and gender, are there significant differences related to IL abilities in ethics and quality?

RQ4. What implications for students, librarians, and academics may be inferred?

Materials and Methods

Sample and Variables

The participants in this study were social sciences undergraduates from five Spanish universities and five disciplines. Data collection was carried out during the 2017–2018 academic year. A stratified sampling by university and degree was applied. Bearing in mind the candidate population (3,415 students), the gathered sample (892) is representative. Students were enrolled in the last two years (the junior and senior years) of their degrees. The majority (799) were under 25 years of age. Their distribution by university was as follows: Complutense University of Madrid (185), the University of Granada (240), Jaume I University in Castellón (110), the University of Málaga (200), and the University of Murcia (156). Given the similarity in the curricula of the participating universities, each university has been considered as a coherent whole, and not as a source of variability. Table 1 displays the demographic features of the participants (see Table 1).

Table 1.

Demographic data on year in college and gender of study participants, by academic field

	Juniors		Seniors	
	Men	**Women**	**Men**	**Women**
Audiovisual communication	69	65	31	33
Information science	22	33	22	45
Pedagogy	17	60	5	31
Journalism	57	114	29	36
Psychology	27	128	15	53
Total	**192**	**400**	**102**	**198**

For data collection, two validated scales were used, IL-HUMASS (Information Literacy Humanities and Social Sciences) and EVALCI (Evaluación de Competencias Informacionales, or, in English, Evaluation of Information Competencies), as well as three dimensions.[46] Two dimensions are subjective, measuring students' motivation; the third is objective, gauging their actual levels of knowledge. The IL-HUMASS questionnaire, devoted to the evaluation of IL levels among social sciences and humanities students, allows an approach to their subjective or motivational side. It consists of an attitudinal scale composed of three dimensions—belief in importance, self-efficacy, and preferred source of learning—and 26 abilities (see Appendix A). While belief in importance refers to awareness about the significance of IL abilities, self-efficacy concerns students' belief in their own ability. In this research, the third dimension, preferred source of learning, was not considered. A one-to-nine Likert scale was employed: ≤ 5 (not any), 5–6 (scarce), 6–7 (moderate), 7–8 (high), and ≥ 8 (excellent).[47] The EVALCI validated questionnaire (http://infocompetencias.org/evalci) was used to measure the objective side of students' actual knowledge on IL abilities (see Appendix B).[48] The same Likert scale was employed. Both scales were distributed online, usually in computer labs, with faculty present to resolve possible doubts that students might have.

Five items each from the IL-HUMASS and EVALCI questionnaires were selected since they were specifically linked either to quality or to ethics. Three related to information quality:

1. To evaluate the quality of information sources (item 9). Evaluation is a key skill of IL, preferably focusing on the quality of information resources. According to the ACRL Framework, "Information resources reflect their creators' expertise and credibility, and are evaluated based on the information need and the context in which the information will be used."[49]

2. To determine whether an information source is up-to-date (item 12). Since the useful life of documents is sometimes limited, the issue of updating information is paramount. This item relates to information timeliness, or the age of the data, within the category of contextual data quality.[50]

3. To know the most relevant authors and institutions in your thematic area (item 13). The issue of information authority has grown in prominence, especially considering that current technology allows the recognition of relevant authors in a field. Authority is a topic of interest in ACRL's Framework: "Learners who are developing their information literacy ability motivate themselves to find authoritative sources."

The fourth and fifth items referred to ethical abilities:

4. To know the code of ethics in your academic/professional field (item 23). It is important that students recognize the existence of profession-specific codes of ethics. This ability requires familiarity with the basic ethical principles of their professional organization, academic libraries included. According to ACRL, students should "follow ethical and legal guidelines in gathering and using information."

5. To communicate/know the laws on the use of information and intellectual property (item 24). This ability is related to the creation, management, communication, and use of information, according to existing ethical standards and legal norms. It specially concerns plagiarism and information security. Consistent with ACRL, learners who are developing their IL abilities "understand that intellectual property is a legal and social construct that varies by culture."[51] Though "copyright laws are both necessary and important . . . librarians should promote information provision as much as possible and work diligently to ward off the overreaching powers of copyright creep and paranoia."[52] For Rebecca Butler, the material that may be borrowed from a copyrighted work is a complex issue that depends on at least four factors: "purpose and character of use, nature of the work, part being copied, and work's marketability."[53]

> **It is important that students recognize the existence of profession-specific codes of ethics.**

Statistical Methods

The statistical methodology employed included descriptive, factorial, and analysis of variance methods. Statistical descriptive analysis sought to determine mean scores in the knowledge of IL abilities in ethics and quality and their distribution depending on the degree the students were working toward, their year in college, and their gender. The main objective of the factor analysis was to summarize data for the better interpretation and understanding of relationships and patterns. It "operates on the notion that measurable and observable variables can be reduced to fewer latent variables [factors] that share common variance and are unobservable . . . a factor loading for a variable is a measure of how much the variable contributes to the factor."[54] The basic steps in factor analysis were two techniques, principal component analysis and varimax rotation with

Kaiser normalization.[55] Such analysis contributed to a better understanding of the factors underlying the observable variables in the three dimensions of belief in importance, self-efficacy, and knowledge.

To gain a better understanding of students' IL abilities in ethics and quality, various factors, such as academic degree, year in college, and gender, were explored. Once the statistically significant differences between these groups of students were known and which factors affected them most, some opportunities for encouragement, engagement, and enhancement emerged. Statistical analysis identified this significant variability through the *t*-test and ANOVA (analysis of variance). The former was useful for comparing years in college and genders, while the latter allowed for comparisons between degrees being pursued.[56] For data processing, IBM SPSS Statistics 22 software was used.

Results

Reliability levels were good and acceptable in both the IL-HUMASS and EVALCI scales, as the Cronbach's alpha coefficients proved: IL-HUMASS (0.929) and EVALCI (0.720). The results were grouped in two sections dealing, respectively, with the observed values and the latent factors related to IL abilities in ethics and quality.[57]

Belief in Importance, Self-Efficacy, and Knowledge

The average scores of IL abilities in ethics and quality were relatively homogeneous in all three dimensions (belief in importance, self-efficacy, and knowledge). Extreme values ranged from "excellence" (8.41) in motivation (belief in importance) regarding ethical codes of information to "insufficiency" (4.79) in actual knowledge of the laws on the use of information and intellectual property (see Table 2). The students achieved the highest scores in belief in importance, with "excellent" values in some skills and qualifications. The lowest score was for self-efficacy, with a large percentage of "moderate" values. The knowledge dimension occupied an intermediate position. There was also homogeneity in the average scores of the degrees studied for, all of them with "high" average values. The highest score (7.45) was for journalism students, and the lowest (7.12) for psychology students.

Underlying Factors

The levels of correlation between the IL abilities in ethics and quality and the dimensions of belief in importance and self-efficacy are meaningful. Concerning knowledge, about a few items correlate significantly. These results validate both the appropriateness of the IL abilities in ethics and quality as the focus of research and the application of the factor analysis technique.[58] Further, Bartlett's tests of sphericity—sig. <0.05—and Kaiser-Meyer-Olkin (KMO) tests of sampling adequacy (0.724>0.70) support the suitability of the factor analysis.[59]

From the five IL abilities in ethics and quality and the three dimensions

> **The levels of correlation between the IL abilities in ethics and quality and the dimensions of belief in importance and self-efficacy are meaningful.**

Table 2.
IL abilities in ethics and quality concerning study participants' belief in importance, self-efficacy, and knowledge scales

Degree	Item	Ability	Scale	Audiovisual communication	Information science	Pedagogy	Journalism	Psychology	Total
						Mean scores			
Quality	9	Quality of information sources	Belief in importance	8.10	7.93	7.89	8.13	8.20	8.05
			Self-efficacy	6.81	6.84	6.58	7.10	6.51	6.77
			Knowledge	7.75	7.68	7.66	7.69	7.59	7.67
	12	Updating of information sources	Belief in importance	7.88	8.02	7.79	8.04	8.08	7.96
			Self-efficacy	6.93	7.14	6.48	7.29	6.24	6.82
			Knowledge	7.54	7.42	7.75	7.44	7.55	7.54
	13	Authority of people and institutions	Belief in importance	7.78	7.66	8.02	7.93	7.97	7.87
			Self-efficacy	6.40	6.02	6.31	6.69	6.28	6.46
			Knowledge	7.68	7.70	7.28	7.47	7.48	7.52
Ethics	23	Ethical codes of information	Belief in importance	7.85	7.58	8.12	8.13	8.41	8.02
			Self-efficacy	6.72	6.25	6.73	7.16	6.74	6.72
			Knowledge	7.79	7.81	7.50	7.80	7.63	7.72
	24	Laws on the use of information and intellectual property	Belief in importance	7.98	7.72	7.64	7.99	7.63	7.79
			Self-efficacy	6.47	6.18	6.15	6.39	5.69	6.18
			Knowledge	6.86	6.78	5.32	6.±0	4.79	6.04

Table 3.
Underlying factors: Rotated component matrix of information literacy abilities in ethics and quality

Rotated component matrix*

Ability	Scale	Component				
		1	2	3	4	5
Quality						
Quality of sources	Belief in importance	**.678**	-.107	.374	.149	.011
	Self-efficacy	.154	.160	**.795**	.083	-.040
	Knowledge	.093	.092	-.113	.472	**.523**
Updating of information sources	Belief in importance	**.750**	-.032	.279	.184	.048
	Self-efficacy	.103	.221	**.700**	.178	.066
	Knowledge	.148	-.115	.054	-.163	**.689**
Authority of people and institutions	Belief in importance	**.705**	.107	.126	-.119	.206
	Self-efficacy	.104	.463	**.484**	-.193	.280
	Knowledge	-.066	.147	.067	.211	**.608**
Ethics						
Ethical code of the profession–activity	Belief in importance	**.717**	.369	-.143	.017	-.033
	Self-efficacy	.179	**.714**	.229	.042	.028
	Knowledge	.195	-.128	.120	**.537**	.045
Laws on information use and intellectual property	Belief in importance	**.622**	.501	-.101	.103	-.061
	Self-efficacy	.034	**.794**	.208	.058	.031
	Knowledge	-.063	.167	.098	**.726**	.018
Percentage of variance explained		**17.18**	**12.84**	**11.73**	**8.47**	**8.37**

Extraction method: principal components analysis.
Rotation method: Varimax with Kaiser normalization.
*Rotation has converged within 10 iterations.

under consideration, the performed factor analysis deploys into five factors that explain 58.60 percent of the variance in the data. The factor loadings of the abilities, measures of how much each factor contributes to the variance, are sizable (see Table 3).

Factor one is the most weighted—it explains 17.18 percent of the variance in the data. It monopolizes the belief in importance dimension, being the only one that brings together the abilities on information ethics and information quality. Factor two relates to the self-efficacy dimension in information ethics abilities, and factor three concerns the same dimension in information quality abilities. The sum of these three factors, which are of a motivational nature, is an important weight in the set of factors, explaining 41.75 percent of the variance in the data.

With a similar weight, factors four and five refer to the knowledge dimension in information ethics and in information quality, respectively. These cognitive factors explain some amount of variance (16.84 percent), although less than the motivational factors (see Table 3).

Nonrandom Variability

The comparison between the average values of each factor in the possible pairings between academic degrees has allowed this study to find significant rates of variability in four of the five factors. Only in factor five do no significant differences appear between degrees (see Figure 1). The greatest number of differences is concentrated in the field of psychology, where students have lower scores in all comparisons between fields. No significant differences appear in the comparisons between journalism, audiovisual communication, and information science.
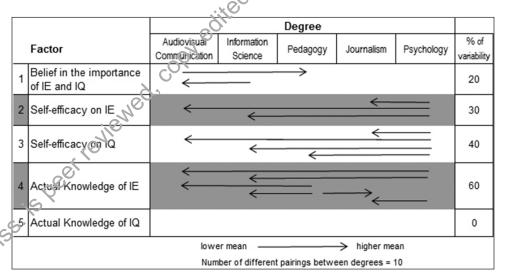

Figure 1. Mean values for each of five factors by the academic degree pursued. Factor one is belief in the importance of information ethics (IE) and information quality (IQ). Factor two is self-efficacy on information ethics, and factor three is self-efficacy on information quality. Factors four and five are knowledge of information ethics and knowledge of information quality.

In the first factor (belief in the importance of information ethics and information quality), there are only two significant differences between degrees; one, between audiovisual communication and information science (sig. = 0.006), with a lower average score for the latter; the other, between audiovisual communication and pedagogy (sig. = 0.031), with a lower score for the former. Considering that there are 10 possible pairings among the five degrees, this factor shows little variability (20 percent) among degrees.

In the second factor (self-efficacy on information ethics), the variability is slightly increased (30 percent), with three significant differences in the comparisons between degrees pursued. All affect psychology students, with lower scores in relation to those of students in audiovisual communication (sig. = 0.006), information science (sig. = 0.015), and journalism (sig. = 0.003). In the third factor (self-efficacy on information quality), the significant differences increase to four (40 percent of variability). Similarly, they all relate to psychology students, who score lower than students pursuing other degrees. Factor four (actual knowledge of information ethics) has the highest number of significant differences (60 percent of variability), affecting psychology and pedagogy students, with lower scores compared to audiovisual communication, information science, and journalism students.

If the two years in college are compared, the significant differences in IL abilities in ethics and quality focus on the factors of self-efficacy regarding information quality (sig. = 0.004) and actual knowledge of information ethics (sig. = 0.000) and information quality (sig. = 0.000) (see Figure 2). Mean scores are higher for senior students. Finally, the comparison regarding the gender of the students shows significant differences in terms of their IL abilities in ethics and quality.

	Factor	Juniors	Seniors
1	Belief in the importance of IE and IQ		
2	Self-efficacy on IE		
3	Self-efficacy on IQ	⟶	
4	Actual Knowledge of IE	⟶	
5	Actual Knowledge of IQ	⟶	

lower mean ⟶ higher mean

Figure 2. Significant differences in mean values between juniors and seniors for each of five factors: (1) belief in the importance of information ethics (IE) and information quality (IQ); (2) self-efficacy on information ethics; (3) self-efficacy on information quality; (4) knowledge of information ethics; and (5) knowledge of information quality.

Discussion and Implications

From the perspective of observable values, students achieve acceptable levels on IL abilities in ethics and quality in both the belief in importance and actual knowledge dimensions. Yet evident signs of weakness emerge in the dimension of self-efficacy.

Factor analysis provides an underlying structure for IL abilities in ethics and quality (see Table 3). The results show that motivational factors (belief in importance and self-efficacy) significantly prevail over cognitive ones (knowledge). Although motivation is a much broader concept, the dimensions of belief in importance and self-efficacy—respectively comparable to John Keller's relevance and confidence[60]—are among its key components.

Within motivation, self-efficacy factors deserve special mention, since they are the most weighted as a variable (see Table 2). This circumstance is accentuated regarding self-efficacy on information ethics. Our concern should focus on self-efficacy as a priority, and more specifically on self-efficacy regarding information ethics. Administrators, faculty, librarians, instructors, and specialists on information ethics and information quality should strive to improve self-efficacy for IL abilities in ethics and quality among students. For Toni Samek, "Academic librarians, with their ethic of intellectual freedom and their relevant education and experience, should be understood to be key

> **Administrators, faculty, librarians, instructors, and specialists on information ethics and information quality should strive to improve self-efficacy for IL abilities in ethics and quality among students.**

academics on campus."[61] In this regard, Heidi Julien and Shelagh Genius refer to affect "as a factor influencing the instructional experiences of library staff."[62]

This study has discovered significant differences in the possible comparisons between academic degrees. Such differences affect mainly psychology students, in the factors self-efficacy on information ethics, self-efficacy on information quality, and knowledge of information ethics. Compared with the students pursuing other degrees, their deficiencies are evident and significant in these three factors. There is considerable homogeneity in the three remaining degrees (journalism, audiovisual communication, and information science). The students studying for these degrees have similar motivations and knowledge of IL abilities in ethics and quality.

Comparing junior and senior students, seniors show significant progress in relation to the IL abilities in ethics and quality involved in the factors of self-efficacy on information quality, knowledge of information ethics, and knowledge of information quality (see Figure 2). Their knowledge of information ethics most needs improvement (see Table 2). On the other hand, the comparison considering the gender declared by the students shows no significant differences.

Considering the prevalence of factors related to the self-efficacy of students, the improvement of their self-esteem in IL abilities in ethics and quality should be a priority. Above all, such improvement should be done in a pleasant and enjoyable way. The use of multimedia products might increase the motivation levels of students, and more

specifically their self-efficacy. "Gamified learning," which uses video game design and game elements to teach, has proved effective in higher education.[63] Any attempts to improve students' assessment of quality should consider such key issues as quality dimensions in data,[64] accuracy, relevancy, representation, and accessibility,[65] as well as quality indicators.[66] The following three quality-related topics ought to be approached:

1. Evaluation of the quality based on information needs and context. Critical evaluation in participatory environments.
2. Checking the updating of information.
3. Types and basic indicators of authority. Credibility of the sources.

Regarding IL ethics abilities, it is essential to consider a series of basic concepts, including ethical participation in communities of learning,[67] ethics in using information,[68] intellectual freedom, equitable access to information, information privacy, and intellectual property as the core issues of information ethics.[69] Improvement sessions should address the following ethical issues:

1. Responsibility in using information data and scholarship ethically.
2. Intellectual property as a legal and social construct.

Intellectual property-related expertise (copyright literacy) deserves special attention, from both the self-efficacy and knowledge dimensions. In all the degree programs surveyed, students demonstrated not only insufficient levels of self-efficacy but also a lack of actual knowledge on this subject. Intellectual property has become increasingly relevant in a world that, in view of the blended and online teaching required due to the coronavirus

> Intellectual property-related expertise (copyright literacy) deserves special attention …

pandemic, must undeniably shift toward open access. Information literacy librarians[70] and teaching faculty should contribute to the improvement of students' motivation and actual knowledge.

Conclusions

Considering both motivational and cognitive perspectives about students' IL abilities in ethics and quality, this research verified a sizable number of correlations among almost all involved items. Though weaknesses in students' observable levels of self-efficacy arise, this dimension is the most important from a deep perspective. The other facet of motivation, belief in importance, is slightly less relevant. Students' motivation—which includes belief in importance and self-efficacy—prevails over their actual knowledge on IL abilities in ethics and quality.

Both information ethics and information quality abilities are equally important for undergraduate students. But they should be treated separately to stimulate their levels of self-efficacy and actual knowledge, as evidenced by the factor structure uncovered. To increase students' self-efficacy, instructional interventions should be a priority, including at least the five topics mentioned earlier: (1) evaluation of quality on the basis of information needs and context (critical evaluation in participatory environments); (2) checking

the updating of information; (3) types and basic indicators of authority (credibility of sources); (4) responsibility in using information data and scholarship ethically; and (5) intellectual property as a legal and social construct.

The interventions should advance students' progress in their levels of self-efficacy—confidence—on IL abilities in ethics and quality. Consequently, their levels of actual knowledge on these issues should also improve.

Acknowledgments

María Pinto is a professor in the Faculty of Information Science at the University of Granada in Granada, Spain; she may be reached by e-mail at: mpinto@ugr.es.

Dora Sales is a senior lecturer in the Faculty of Human and Social Sciences at Jaume I University in Castellón, Spain; she may be reached by e-mail at: dsales@trad.uji.es.

Rosaura Fernández-Pascual is a senior lecturer in the Faculty of Economic and Business Sciences at the University of Granada in Granada, Spain; she may be reached by e-mail at rpascual@ugr.es.

Appendix A

IL-HUMASS (Information Literacy Humanities and Social Sciences) Questionnaire

In the current information and knowledge society, it is important to access, analyze, and use information adequately. For this to occur, as set out in the framework of the European Higher Education Area, a series of competencies and abilities related to the search, evaluation, management, use, and diffusion of information are needed. This questionnaire is designed to find out your opinion on your own competencies and abilities in the handling and use of information. Please indicate your assessment of the following competencies by marking the circle that best expresses your answer on a scale from 1 (low competency) to 9 (excellent competency). We also ask you to assess each competency in relation to the three variables (motivation, self-efficacy, and favorite source of learning) that are described below:

Motivation	Assess your motivation of the following competencies for your academic progress.
Self-efficacy	Assess your level of skill in the following competencies.
Source of learning	Where did you learn these competencies? (class, library, courses, self-learning, others). Select the appropriate option/options.

Help us to improve; in your training, your opinion is important.

With regard to . . .	Motivation	Self-efficacy	Source of learning
Competencies or abilities	Low to high 1 2 3 4 5 6 7 8 9	Low to high 1 2 3 4 5 6 7 8 9	Cl Class Co Courses L Library S Self-learning O Others
Information search			
1. To use printed sources of information (books, papers, etc.).			
2. To enter and use automated catalogs.			
3. To consult and use electronic sources of primary information (journals, etc.).			
4. To use electronic sources of secondary information (databases, etc.)			

5. To know the terminology of your subject.			
6. To search for and retrieve Internet information (advanced searches, directories, portals, etc.).			
7. To use informal electronic sources of information (blogs, discussion lists, etc.).			
8. To know information search strategies (descriptors, Boolean operators, etc.).			
Information evaluation			
9. To assess the quality of information resources.			
10. To recognize the author's ideas within the text.			
11. To know the typology of scientific information sources (thesis, proceedings, etc.).			
12. To determine whether an information source is up-to-date.			
13. To know the most relevant authors and institutions within your subject area.			
Information processing			
14. To schematize and abstract information.			
15. To recognize text structure.			
16. To use database managers (Access, MySQL, etc.).			
17. To use bibliographic reference managers (EndNote, Reference Manager, etc.).			
18. To handle statistical programs and spreadsheets (SPSS, Excel, etc.).			
19. To install computer programs.			

Information communication and diffusion			
20. To communicate in public.			
21. To communicate in other languages.			
22. To write a document (report, academic work, etc.).			
23. To know the code of ethics in your academic/ professional field.			
24. To know the laws on the use of information and intellectual property.			
25. To create academic presentations (PowerPoint, etc.).			
26. To disseminate information on the Internet (websites, blogs, etc.).			
Please mention any relevant needs for your academic training that would improve your information competency.			

Category	o Student o Academic o Librarian		
Sex	o Male o Female	Age	
University			
Degree		Course	o 1st o 2nd o 3rd o 4th o 5th o master o PhD
Thank you for your collaboration.			
If you would like to receive the results of this project, write your e-mail address here.			

Appendix B

EVALCI-KN (Evaluación de Competencias Informacionales—in English, Evaluation of Information Competencies) Knowledge Test

Five items were selected from the EVALCI questionnaire because of their links either to quality or to ethics:

Item 9. To evaluate the quality of information sources.

You are preparing a class project on "Customs and ways of life of the inhabitants of Portugal and its colonies." You find quite a few electronic resources, but before using them you want to evaluate their reliability. Which of the following criteria would you use?

- Resources from Portuguese academic and cultural institutions (.edu, .org).
- Commercial pages (.com).
- Bilingual resources from social networks.
- The information must come from a digital newspaper.
- No opinion/No reply.

Item 12. To determine whether an information source is up-to-date.

To find out if the information contained in a document is updated, what information would you look at?

- Only the references.
- The form of writing, focused on the use of temporal adverbs (currently, always . . .).
- If the authorship is clearly indicated.
- The date of the last edition.
- No opinion/No reply.

Item 13. To know the most relevant authors or institutions in your thematic area.

What criteria do you usually use to find out if an author is relevant to your subject area?

- Reputation, institutional affiliation, and thematic competence.
- If he/she has just a few publications.
- His/her positioning in the search engines.
- Having heard of him/her.
- No opinion/No reply.

Item 23. To know the code of ethics in your academic/professional field.

Do you consider it ethical to use the ideas of other authors to produce a research paper?

- No, because the ideas of a work must always be original.
- Yes, if I refer to the source work or if I have the proper authorization.
- Yes, I can copy them freely.
- Yes, as long as I literally copy them.
- No opinion/No reply

Item 24. To communicate/know the laws on the use of information and intellectual property.

We know that the original published works are protected by copyright, so their use is subject to the legal regime of the Law on Intellectual Property. However, there are works on the Internet that use the Creative Commons license to indicate that:

- The content has been developed and belongs to the person presenting the resource, and cannot be consulted without permission.
- The author wishes to share his/her work, allowing its reuse by third parties under a number of conditions.
- The document is not copyrighted and can be plagiarized.
- It is a document for free circulation.
- No opinion/No reply.

Notes

1. Stéphane Goldstein, ed., *Informed Societies: Why Information Literacy Matters for Citizenship, Participation and Democracy* (London: Facet, 2020).

2. Birger Hjørland, "Towards a Theory of Aboutness, Subject, Topicality, Theme, Domain, Field, Content . . . and Relevance," *Journal of the American Society for Information Science and Technology* 52, 9 (2001): 774–78, here 777.

3. Luciano Floridi, *The Ethics of Information* (Oxford, U.K.: Oxford University Press, 2013).

4. Rafael Capurro, "Towards an Ontological Foundation of Information Ethics," *Ethics and Information Technology* 8, 4 (2006): 175–86, here 175, https://doi.org/10.1007/s10676-006-9108-0.

5. Richard O. Mason, "Four Ethical Issues of the Information Age," *MIS* [management information systems] *Quarterly* 10, 1 (1986): 5–12, here 11, https://doi.org/10.4324/9781315259697-8.

6. Sonia Bodi, "Ethics and Information Technology: Some Principles to Guide Students," *Journal of Academic Librarianship* 24, 6 (1998): 459–63, here 460, https://doi.org/10.1016/S0099-1333(98)90007-6; Barbara Schultz-Jones, "Information Literacy: Ethics," 2013, https://www.ifla.org/files/assets/school-libraries-resource-centers/schultzjones_infoliteracyethics.pdf.

7. Nancy Tuana, "Conceptualizing Moral Literacy," *Journal of Educational Administration* 45, 4 (2007): 364–78, here 377, https://doi.org/10.1108/09578230710762409.

8. Kenneth Einar Himma, "Foundational Issues in Information Ethics," *Library Hi Tech* 25, 1 (2007): 79–94, https://doi.org/10.1108/07378830710735876.

9. Donald L. McCabe, Linda Klebe Treviño, and Kenneth D. Butterfield, "Cheating in Academic Institutions: A Decade of Research," *Ethics & Behavior* 11, 3 (2001): 219–32, here 220.

10. Toni Carbo and Stephen Almagno, "Information Ethics: The Duty, Privilege and Challenge of Educating Information Professionals," *Library Trends* 49, 3 (2001): 510–18, here 511.

11. George J. Aulisio, "Copyright in Light of Ethics," *Reference Services Review* 41, 3 (2013): 566–75, here 567, https://doi.org/10.1108/RSR-01-2013-0001.

12. Elizabeth Gadd, "UK University Policy Approaches towards the Copyright Ownership of Scholarly Works and the Future of Open Access," *Aslib* [Association for Information Management] *Journal of Information Management* 69, 1 (2017): 95–114, here 99–101, https://doi.org/10.1108/AJIM-06-2016-0092.

13. Kay Mathiesen, "What Is Information Ethics?" *Computers and Society* 32, 8 (2004): 1–11, here 2, https://doi.org/10.1145/1050305.1050312.

14. Rosemary Ruhig Du Mont, "Ethics in Librarianship : A Management Model," *Library Trends* 40, 2 (1991): 201–15, here 203–6; Kay Mathiesen and Don Fallis, "Information Ethics and the Library Profession," chap. 9 in *The Handbook of Information and Computer Ethics*, ed. Kenneth Einar Himma and Herman T. Tavani (Hoboken, NJ: Wiley, 2009), 221–44, here 222, https://doi.org/10.1002/9780470281819.

15. Don Fallis, "Information Ethics for Twenty-First Century Library Professionals," *Library Hi Tech* 25, 1 (2007): 23–36, here 24, https://doi.org/10.1108/07378830710735830.

16. John M. Budd, "Toward a Practical and Normative Ethics for Librarianship," *Library Quarterly* 76, 3 (2006): 251–69, here 267, https://doi.org.10.1086/511140.

17. William M. Cross and Phillip M. Edwards, "Preservice Legal Education for Academic Librarians within ALA-Accredited Degree Programs," *portal: Libraries and the Academy* 11, 1 (2011): 533–50, here 533.

18. Catherine Foster and David McMenemy, "Do Librarians Have a Shared Set of Values? A Comparative Study of 36 Codes of Ethics Based on [Michael] Gorman's *Enduring Values*," *Journal of Librarianship and Information Science* 44, 4 (2012): 249–62, here 249, https://doi.org/10.1177/0961000612448592.

19. United Nations Educational, Scientific and Cultural Organization (UNESCO), *Rethinking Education: Towards a Global Common Good?* (Paris: UNESCO, 2015), 41.

20. American Library Association (ALA), "Library Bill of Rights," 1996, www.ala.org/advocacy/intfreedom/librarybill; ALA, "Code of Ethics of the American Library Association," 2008, http://www, http://www.ala.org/advocacy/sites/ala.org.advocacy/files/content/proethics/codeofethics/Code%20of%20Ethics%20of%20the%20American%20Library%20Association.pdf.

21. Society of College, National and University Libraries (SCONUL) Working Group on IL, "The SCONUL Seven Pillars of Information Literacy: Core Model for Higher Education," 2011, 3, https://www.sconul.ac.uk/sites/default/files/documents/coremodel.pdf.

22. Association of College and Research Libraries (ACRL), "Framework for Information Literacy for Higher Education," 2016, http://www.ala.org/acrl/standards/ilframework.

23. Information Literacy Group, "CILIP [Chartered Institute of Library and Information Professionals] Definition of Information Literacy 2018," 2018, 3, https://infolit.org.uk/ILdefinitionCILIP2018.pdf.

24. Wallace C. Koehler and J. Michael Pemberton, "A Search for Core Values: Towards a Model Code of Ethics for Information Professionals," *Journal of Information Ethics* 9, 1 (2000): 26–54, here 36–39.

25. Larry A. Pace, "The Ethical Implications of Quality," *Electronic Journal of Business Ethics and Organization Studies* 4, 1 (1999).

26. Yair Wand and Richard Y. Wang, "Anchoring Data Quality Dimensions in Ontological Foundations," *Communications of the ACM* [Association for Computing Machinery] 39, 11 (1996): 86–95, here 94-95.

27. Holmes Miller, "The Multiple Dimensions of Information Quality," *Information Systems Management* 13, 2 (1996): 79–82, https://doi.org/10.1080/10580539608906992.

28. Randall McClure and Kellian Clink, "How Do You Know That? An Investigation of Student Research Practices in the Digital Age," *portal: Libraries and the Academy* 9, 1 (2009): 115–32, here 117, http://muse.jhu.edu/content/crossref/journals/portal_libraries_and_the_academy/v009/9.1.mcclure.html.

29. María Pinto, "An Approach to the Internal Facet of Information Literacy Using the IL-HUMASS [Information Literacy Humanities Social Sciences] Survey," *Journal of Academic Librarianship* 37, 2 (2011): 145–54, https://doi.org/10.1016/j.acalib.2011.02.006.

30. Richard Y. Wang and Diane M. Strong, "Beyond Accuracy: What Data Quality Means to Data Consumers," *Journal of Management Information Systems* 12, 4 (1996): 5–33, here 20, https://doi.org/10.1080/07421222.1996.11518099.

31. Rosanne Price and Graeme Shanks, "A Semiotic Information Quality Framework: Development and Comparative Analysis," *Journal of Information Technology* 20, 2 (2005): 658–72, https://doi.org/10.1057/palgrave.jit.2000038.

32. Stuart E. Madnick, Richard Y. Wang, Yang W. Lee, and Hongwei Zhu, "Overview and Framework for Data and Information Quality Research," *ACM Journal of Data and Information Quality* 1, 1 (2009): 1–22, https://doi.org/10.1145/1515693.1516680.

33. Mona Alkhattabi, Daniel Neagu, and Andrea Cullen, "Information Quality Framework for e-Learning Systems," *Knowledge Management & E-Learning* 2, 4 (2010): 340–62, here 355, https://doi.org/10.34105/j.kmel.2010.02.025.

34. Yang W. Lee, Diane M. Strong, Beverly K. Kahn, and Richard Y. Wang, "AIMQ [assistance in maintenance and quality]: A Methodology for Information Quality Assessment," *Information & Management* 40, 2 (2002): 133–46, https://doi.org/10.1016/S0378-7206(02)00043-5.

35. Besiki Stvilia, Les Gasser, Michael B. Twidale, and Linda C. Smith, "A Framework for Information Quality Assessment," *Journal of the American Society for Information Science and Technology* 58, 12 (2007): 1720–33, here 1720, https://doi.org/10.1002/asi.20652.

36. Jens-Erik Mai, "The Quality and Qualities of Information," *Journal of the American Society for Information Science and Technology* 64, 4 (2013): 675–88, here 675, https://doi.org/10.1002/asi.22783.

37. Megan Oakleaf, "Building the Assessment Librarian Guildhall: Criteria and Skills for Quality Assessment," *Journal of Academic Librarianship* 39, 2 (2013): 126–28, here 128, https://doi.org/10.1016/j.acalib.2013.02.004.

38. ACRL, "Framework for Information Literacy for Higher Education," 10.

39. Marc Meola, "Chucking the Checklist: A Contextual Approach to Teaching Undergraduates Web-Site Evaluation," *portal: Libraries and the Academy* 4, 3 (2004): 331–44, here 342, https://doi.org/10.1353/pla.2004.0055.

40. Albert Bandura, "Self-Efficacy," in *Encyclopedia of Human Behavior*, ed. V.S. Ramachaudran, vol. 4 (New York: Academic, 1994), 71–81, here 71.

41. Micaela Waldman, "Freshmen's Use of Library Electronic Resources and Self-Efficacy," *Information Research* 8, 2 (2003): 26.

42. Penny M. Beile and David N. Boote, "Does the Medium Matter? A Comparison of a Web-Based Tutorial with Face-to-Face Library Instruction on Education Students' Self-Efficacy Levels and Learning Outcomes," *Research Strategies* 20, 1 (2004): 57–68, here 58, https://doi.org/10.1016/j.resstr.2005.07.002.

43. María Pinto and Rosaura Fernández-Pascual, "How a Cycle of Information Literacy Assessment and Instruction Stimulates Attitudes and Motivations of LIS Students: A Competency-Based Case Study," *Journal of Librarianship and Information Science* 51, 2 (2019): 370–86, https://doi.org/10.1177/0961000617742447.

44. Konstantinos V. Petrides, "An Application of Belief-Importance Theory with Reference to Trait Emotional Intelligence, Mood, and Somatic Complaints," *Scandinavian Journal of Psychology* 52, 2 (2011): 161–67, here 161, https://doi.org/10.1111/j.1467-9450.2010.00832.x.

45. John M. Keller, "The ARCS [attention, relevance, confidence, satisfaction] Model of Motivational Design," in *Motivational Design for Learning and Performance: The ARCS Model Approach* (Boston: Springer, 2010), 43–74, https://doi.org/10.1007/978-1-4419-1250-3.

46. María Pinto and Rosaura Fernández-Pascual, "Exploring LIS Students' Beliefs in Importance and Self-Efficacy of Core Information Literacy Competencies," *College & Research Libraries* 77, 6 (2016): 703–26, https://doi.org/10.5860/crl.77.6.703; Pinto, "An Approach to the Internal Facet of Information Literacy Using the IL-HUMASS Survey."

47. María Pinto, "Design of the IL-HUMASS Survey on Information Literacy in Higher Education: A Self-Assessment Approach," *Journal of Information Science* 36, 1 (2010): 86–103; Pinto, "An Approach to the Internal Facet of Information Literacy Using the IL-HUMASS Survey."

48. María Pinto and Rosaura Fernández-Pascual, "A Diagnosis of the Levels of Information Literacy Competency among Social Sciences Undergraduates," *portal: Libraries and the Academy* 17, 3 (2017): 569–93.

49. ACRL, "Framework for Information Literacy for Higher Education," 4, 8–9.

50. Richard Y. Wang and Diane M. Strong, "Beyond Accuracy: What Data Quality Means to Data Consumers," *Journal of Management Information Systems* 12, 4 (1996): 5–34, here 14.
51. ACRL, "Framework for Information Literacy for Higher Education," 3.
52. Aulisio, "Copyright in Light of Ethics," 573.
53. Rebecca P. Butler, "Copyright Law and Organizing the Internet," *Library Trends* 52, 2 (2003): 307–17, here 308.
54. An Gie Yong and Sean Pearce, "A Beginner's Guide to Factor Analysis: Focusing on Exploratory Factor Analysis," *Tutorials in Quantitative Methods for Psychology* 9, 2 (2013): 79–94, here 80, https://doi.org/10.20982/tqmp.09.2.p079.
55. Jamie DeCoster, "Overview of Factor Analysis," 1998, http://www.stat-help.com/factor.pdf; Alan Taylor, "A Brief Introduction to Factor Analysis," *Journal of Chemical Information and Modeling* 53 (2001): 160, https://doi.org/10.1017/CBO9781107415324.004.
56. H. J. Keselman, Carl J. Huberty, Lisa M. Lix, Stephen Olejnik, Robert A. Cribbie, Barbara Donahue, Rhonda K. Kowalchuk, et al., "Statistical Practices of Educational Researchers: An Analysis of Their ANOVA [analysis of variance], MANOVA [multivariate analysis of variance], and ANCOVA [analysis of covariance] Analyses," *Review of Educational Research* 68, 3 (1998): 350–86, https://doi.org/10.3102/00346543068003350.
57. Karl Schweizer, "On the Changing Role of Cronbach's α in the Evaluation of the Quality of a Measure," *European Journal of Psychological Assessment* 27, 3 (2011): 143–44, https://psycnet.apa.org/doi/10.1027/1015-5759/a000069; Daniel McNeish, "Thanks Coefficient Alpha, We'll Take It from Here," *Psychological Methods* 23, 3 (2018): 412–33, https://doi: 10.1037/met0000144.
58. Joseph F. Hair, William C. Black, and Barry J. Babin, *Multivariate Data Analysis: A Global Perspective* (Upper Saddle River, NJ: Pearson, 2010).
59. Ashley J. Reeves, Russell T. Baker, Madeline P. Casanova, Scott W. Cheatham, and Michael A. Pickering, "Examining the Factorial Validity of the Quality of Life Scale," *Health and Quality of Life Outcomes* 18, 1 (2020): 1–17; Nancy L. Leech, Karen C. Barrett, and George A. Morgan, *IBM SPSS for Intermediate Statistics: Use and Interpretation*, 5th ed. (New York: Routledge, 2015); Fred B. Bryant and Paul R. Yarnold, "Principal-Components Analysis and Exploratory and Confirmatory Factor Analysis," in *Reading and Understanding Multivariate Statistics*, ed. Laurence G. Grimm and Paul R. Yarnold (Washington, DC: American Psychological Association, 1995), 99–136.
60. Keller, "The ARCS Model of Motivational Design."
61. Toni Samek, "Teaching Information Ethics in Higher Education: A Crash Course in Academic Labour," *International Review of Information Ethics* 14 (2010): 4–9, here 6.
62. Heidi Julien and Shelagh K. Genuis, "Emotional Labour in Librarians' Instructional Work," *Journal of Documentation* 65, 6 (2009): 926–37, here 934, https://doi.org/10.1108/00220410910998924.
63. Sujit Subhash and Elizabeth A. Cudney, "Gamified Learning in Higher Education: A Systematic Review of the Literature," *Computers in Human Behavior* 87 (2018): 192–206, https://doi.org/10.1016/j.chb.2018.05.028.
64. Miller, "The Multiple Dimensions of Information Quality"; Wand and Wang, "Anchoring Data Quality Dimensions in Ontological Foundations."
65. Wang and Strong, "Beyond Accuracy."
66. McClure and Clink, "How Do You Know That?"
67. ACRL, "Framework for Information Literacy for Higher Education."
68. Information Literacy Group, "CILIP Definition of Information Literacy 2018."
69. Fallis, "Information Ethics for Twenty-First Century Library Professionals."
70. ACRL, "Framework for Information Literacy for Higher Education."