Assessing Students' Digital Skills in Writing Research Papers

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ABSTRACT

Universities around the world are working towards becoming research universities. The emergence of online research databases (Web of Science, ResearchGate, Google Scholar, Scopus, Academia, etc.) has created opportunities for researchers to learn about research from anywhere in the world. Students studying at the undergraduate level have not learned the course “Scientific Research Methodology”. However, it is not enough for graduate students to study the course traditionally, but only 2-3 credit hours, and they unable to perform research practice to a sufficient extent. Although students aim to increase their digital skills and English language knowledge and skills through social networks and short and medium-term training, they do not make any efforts or efforts to increase their electronic research skills, which has the consequence of being lacking in the mandatory skills of graduates of the new century. In addition to the teaching staff, a library, and a technology-based learning model are important for increasing students’ research skills, which are lacking in Mongolia. This study aims to assess students’ digital skills and electronic skills in writing research papers using English. The sample of the study was collected from undergraduate, graduate, and doctoral students in public and private universities. When comparing English language proficiency and research skills, ($p=0.002<0.005$) there was a weak direct correlation, and the correlation was statistically significant. This study has theoretical and practical significance and will provide recommendations to policymakers and decision-makers in the future to put research into economic circulation and evaluate the knowledge economy.

Keywords: Research skills, digital skills, English language skills

INTRODUCTION

Education focuses on equipping individuals with the knowledge and skills necessary for success and self-development, as highlighted by [1] in her 2019 academic work. Nowadays, one of the essential skills that students must acquire is research and analytical skills. The need for students to carry out research work is minimal. Although students are required to complete independent work within the scope of their courses, they cannot conduct it at a research level. In today’s world, analytical skills are indispensable in all workplaces. Therefore, there is a need to assess students' digital research skills. This study aims to assess students’ ability to write research papers using English and digital tools. This research is both theoretically and practically significant and will contribute to the improvement of teaching and learning, higher education reforms, curriculum development, and research on both teacher and student development. Students studying at the undergraduate level have not learned the course “Scientific Research Methodology”. The sample of the

study was collected from undergraduate, graduate, and doctoral students in public and private universities.When comparing English language proficiency and research skills, ($p=0.002<0.005$) there was a weak direct correlation, and the correlation was statistically significant. In other words, English language proficiency and research skills were directly related. This study has both theoretical and practical significance, providing recommendations to policymakers and decision-makers for the future implementation of research into economic circulation and the evaluation of the knowledge economy. It will also contribute to research on teaching, learning, higher education reform, curricula, plans, and teacher and student development.

LITERATURE REVIEW

This section reviews studies on students' digital skills, research skills, and English language proficiency. Digital skills are essential for searching research papers, using them in research, and citing references. It was emphasized that proficiency in the English language is increasingly crucial for conducting research with scientific rigor.

Digital Skills

Digital skills are one of the core competencies in the European lifelong learning system [2]. In 2006, the European Parliament and Council defined these core competencies as: (1) communication in the mother tongue, (2) communication in foreign languages, (3) mathematical and scientific literacy, (4) digital literacy, (5) learning to learn, (6) social and civic competencies, (7) entrepreneurship, and cultural awareness and expression. The European Commission's 2013 report proposed a new system for developing digital competencies. [3] studied skills related to working on the internet, internet usage skills, online communication skills, and content creation skills. Some existing measures of internet skills focus solely on the technical aspects of internet use [4-7]). These technical aspects are often referred to as “button knowledge.” However, it is now widely accepted that internet skills involve a more nuanced understanding. Several perspectives emphasize that internet skills should be assessed by considering both the basic skills required for using the internet and the skills needed to understand and use online content [8-12]. Evaluating digital skills by taking into account content-related internet skills avoids the more technology-centered view. When assessing students’ digital skills, challenges such as difficulties with using computers [13], lack of in-depth technological knowledge [14], limited knowledge of advanced applications, and poor problem-solving skills [15] have been identified

Research skills

In addition to these perspectives, research skills can be categorized into conceptual, methodological, analytical, and communication competencies. International models, such as the OECD's Definition and Selection of Competencies (DeSeCo) and the Vitae Researcher Development Framework, provide comprehensive definitions that highlight the ability to identify research problems, design robust methodologies, collect and interpret data, and disseminate findings effectively. These competencies are essential across disciplines and underpin students' capacity to contribute new knowledge.

Several concepts have been developed to implement research-oriented teaching in higher education in the last 15 years. The definition of research competences, however, has received minor attention so far. Some approaches to modeling research competences describe these competences along the research process but either focus on a specific academic discipline and/or specific facets or offer no empirical verification for cross-disciplinary approaches [16]. According to Butts (1991), research practice across various academic disciplines has in common that the aim of research is generating new knowledge on the basis of empirical data. [17] appropriately identifies that research and inquiry do not exist solely to help students pursue an academic career, but are central to professional life in the twenty-first century. [18] studied learning from research skill development to work skills development, and in this frame, created research skills reflection as curious, determined, discerning, harmonizing, creative and constructive.

English language skills

Within the specific context of writing research papers, English proficiency plays a crucial role in understanding scholarly literature, formulating arguments, and ensuring clarity in presenting research outcomes. Academic writing in English requires mastery of discipline-specific vocabulary, adherence to formal style conventions, and the ability to synthesize sources coherently. Therefore, English language competence directly supports students' research productivity and international engagement. English proficiency [19] have stated that high level English communication skills are strongly associated with employment. Employment ability refers to the ability to gain acceptance in the labor market, maintain it, and (or) move to the highest position. In most cases, especially in modern Indonesian contexts, it depends on the ability to speak English fluently and convey ideas effectively, as well as the ability to read and read. However, the curricula do not match organizational skills [20]. As a result, it was concluded that although the learners had been learning English for six years, their communication skills did not reach the required level in the field of overseas cooperation and competitive workforce. English is the language of academic and global communication, as English is very important for research. The following conclusions confirm why it plays such an important role

METHODLOGY

The questionnaire consisted of three main sections: (1) demographic information (age, gender, field of study, degree level, and type of university), (2) self-assessment of digital skills (use of online databases, referencing software, data analysis tools, and collaborative platforms), and (3) English language and research skills (reading comprehension of academic texts, academic writing ability, citation practices, and prior experience in presenting or publishing research). This study uses a convenient sampling technique in which we select the students of Mongolian universities accessible via postal mail or email. The survey was administered to 300 students studying in undergraduate, master's, and doctoral programs at state and private universities in Mongolia. 171 students participated in the survey. Responses were measured using a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. This study was conducted using a quantitative survey method, and a questionnaire are developed.

Research framework and Hypotheses

The study hypotheses, which investigate the determinate variables, are depicted in the framework below. The model shows that Research skills is an endogenous variable influenced by three exogenous variables, such as Students' digital skills, Students' English language skills and Digital skills. The research framework is drawn in figure 1.

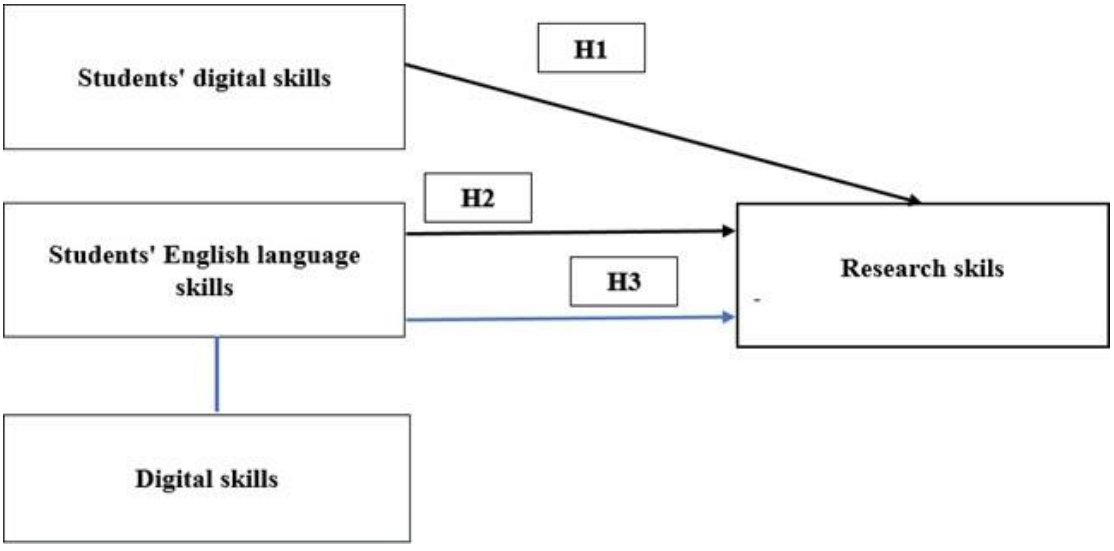

Figure 1. Research framework

This study formulates three hypotheses

Hypotheses (H1). Students' digital skills positively influences to research skills.

Hypotheses (H2). Students' English language skills positively influences to research skills.

Hypotheses (H3). Digital skills will positively impact research skills through English language skills.

RESULT

Descriptive statistics, reliability of variables, factor, and linear regression analyses were performed using SPSS software.

Descriptive statistics

Table 1. Respondents's profile

№	Variebles	Items	Frequency	Percent
1	Age	18-27	100	58.5
		28-37	47	27.5
		38-47	17	9.9
		48 up	7	4.1
2	Gender	Male	42	24.6
		Female	129	75.4
3.	Learning programs	Business administration	34	19.9
		Education management	43	25.1
		Information technology and software	11	6.4
		Law	31	18.1
		Teacher	13	7.6
		Foreign language	16	9.4
		International relations	23	13.5
		Natural science	0	0
4.	Students' Grade	Undergraduate student- II grade	15	8.8
		Undergraduate student- II grade	42	24.6
		Undergraduate student- II grade	40	23.4
		Undergraduate student- II grade	16	9.4
		Study on Saturday's class	6	3.5
		Master student	42	24.6
		Doctoral student	10	5.8
5.	Classification of universities	Public	64	37.4
		Private	107	62.6
6.	Have you presented at an international conference?	yes	64	37.4
		No	107	62.6
7.	Have you written a research paper?	Yes	57	33.3
		No	114	66.7
8.	Have you been published in an international scientific journal?	Yes	22	12.9
		No	149	87.1

According to the demographic data of the study, 58.5% of people aged 18-27, 75.4% of women, 25.1% of education management majors, 24.% of second-year undergraduate students, 24.6% of graduate students, 62.6% of private school students, and 37.4% of people studying in state-owned schools. It was seen that 62.6% of those who did not discuss academic work, 66.7% of those who did not conduct micro-research, % of those who published articles in academic journals, and 12.9% of those who published articles in academic journals were found to be present

Table 2. Results of comparative test

		Have you present in international conference?		Total
		yes	no	
Studetns's grade	Undergraduate students- I grade	4	11	15
		26.7%	73.3%	100.0%
	Undergraduate students- I grade	16	26	42
		38.1%	61.9%	100.0%
	Undergraduate students- III grade	11	29	40
		27.5%	72.5%	100.0%
	Undergraduate students- IV grade	10	6	16
		62.5%	37.5%	100.0%
	Students study on Saturday	2	4	6
		33.3%	66.7%	100.0%
	Master students	13	29	42
		31.0%	69.0%	100.0%
	Doctoral students	8	2	10
		80.0%	20.0%	100.0%
Total		64	107	171
		37.4%	62.6%	100.0%

a. Chi(df): 21.981 (12), p=0.038, Phi: 0.638

In Table 2, when the significance was tested using crosstab, the Chi-square value was 21.981, the degree of freedom was 12, and p=0.038<0.05, indicating statistical significance. According to the results of the comparative analysis, 62.5% of 4th-year undergraduates and 80% of doctoral students reported giving presentations at academic conferences.

Table 3. Results of reliability test

№	Variables	Items	Crobach α
1	Digital skills (DS)	**4**	**0.768**
2	Research skills (RS)	**7**	**0.910**
3	English language skills (ELS)	**4**	**0.878**
	Total	**15**	**0.842**

Note: Item details are as follows: SDS1. For me, the ability to use Moodle/zoom platform /platform I use/. SDS2. For me, the ability to use any database. SDS 3. For me, the ability to create accounts on research sites such as ResearchGate, Google scholar, and ScienceDirect. SDS 4. For me, the ability to search for and cite

domestic academic journals.SRS1. For me, the ability to search and download research from research sites such as ResearchGate, Google scholar, and ScienceDirect. SRS2 For me, the ability to read and analyze research papers in Mongolian. SRS3 For me, the ability to use statistical data in research. SRS4 For me, the ability to develop questionnaires for use in research work. SRS5 For me, the ability to analyze research data in software. SRS6 For me, the ability to write research conclusions. SRS7 For me, the ability to write a bibliography section of a research paper. ELS1 My English reading comprehension skills. ELS2 My English writing skills.ELS3 My academic writing skills in Mongolian. ELS4 My academic writing skills in English.

For the research work, the reliability test of the variable is tested, and the appropriate level of reliability analysis is above 0.6 /Table 3/. The Cronbach's alpha value was 0.768 for digital skills, which is acceptable; 0.910 for research skills, which is very good; and 0.878 for English skills /Table 3/. So it is possible to continue next analysis.

Table 4. Factor analysis

№	Variablea	Items		EFA
1	Students's Digital skills (SDS)	DS1	59.588	0.768
		DS2		0,815
		DS3		0.739
		DS4		0.764
2	Students's Research skills (SRS)	RS1	65.387	0.706
		RS2		0.741
		RS3		0.864
		RS4		0.869
		RS5		0.827
		RS6		0.831
		RS7		0.810
3	English language skills (ELS)	ELS1	73.576	0.875
		ELS2		0.878
		ELS3		0.786
		ELS4		0.888
	KMO	0.930		

The factor analysis showed that the KMO value was above 0.5, and the main questions such as digital skills, research skills, and English language needs were all divided into factors or showed related results. Also, the total average score showed that English language skills were 73.576, which is higher than the others /Table 4/. This indicates that English language skills are slightly more important than the others.

Table 5. Hypotheses test

№	Hypotheses formulation	R	t	F	β	Accept/reject
H1	Students' digital skills is positively influences to research skills.	.519	5.099	184.286	0.722	P=.000 sig .007 H1 accepted
H2	Student's English language skills is positively influences to research skills.	.396	11.084	110.599	0.629	P=.000, sig .000 H2 accepted
H3	Digital skills will positively impact research skills through English language skill	.431	8.058	65.451	0.760	P=.000 sig .000 H3 accepted

Hypothesis 1. Research skills and digital skills are positively correlated, with a correlation coefficient of R=0.519** Sig 0.007, indicating a positive and strong correlation, which is confirmed.

Correlation		Research skills
		Kendall's tau_b
English language skills	Correlation Coefficient	.452*
	Sig. (2-tailed)	0.002
	N	171
*.Sigmificant level 0.05		

When comparing English language skills and research skills, p=0.002<0.005) indicates a direct weak relationship, and correlation is statistically significant. In other words, English language skills and research skills were inextricably linked.

Hypothesis 2. Our findings exhibited in Table 5 accept H2 and conclude that Student's English language skills is positively influences to research skills. [21] have confirmed that the process of mastering students' research skills when learning a foreign language is directly connected with their teacher's research skill level.

CONCLUSION AND MANAGERIAL IMPLICATION

The purpose of the research work was to evaluate the electronic skills of Mongolian university students in writing research papers. Considering that the student's research knowledge, skills, English and digital skills are necessary for writing a research paper, these were selected as variables depending on the research work and regardless. The research sample was randomly collected from 171 students of state-owned and private universities (Bachelor's, Master's, Doctoral students) and the results were obtained by analyzing outline statistics, thruster reliability, factor, correlation and linear regression in SPSS 26v. There were 3 skills: digital skills, research skills, and English language skills, the most important and necessary of which is English language skills, which is 73,576 or the highest of the other two skills. More than 60% of the students said that they had never discussed an academic report, and when comparing it, it was found that 62.5% of the 4th year undergraduate students and 80% of the doctoral students were presenting at academic conferences. When comparing English language skills and research skills (p=0.002<0.005), it indicates a direct weak relationship, and correlation is statistically significant. It is shown that universities and colleges need to include research methodology courses in undergraduate curricula, motivate students to do research, provide research writing practice, and organize interesting activities to increase students' academic English language skills and digital skills

Data Collection Techniques

To gather questions on leadership style, organizational climate, job satisfaction, and demographic details, a paper-based survey was handed out. The survey used a 5-point Likert scale, where participants rated their level of agreement from 1 (strongly dissatisfied) to 5 (strongly satisfied), reflecting their personal views.

Data Analysis Tools

Data analysis was carried out using SPSS and AMOS v24. The techniques included descriptive statistics, and factor analysis (EFA). The instruments' reliability and validity were evaluated using Cronbach's alpha, KMO, and Bartlett's test.

Data Availability Statement

1. The data is available from the corresponding author upon reasonable request.
2. The data supporting the outcome of this research work has been reported in this manuscript.

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Conflict of interest

"The authors declare no conflicts of interest."

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