

DOCTORAL STUDENTS' SELF-ASSESSED KNOWLEDGE AND ABILITY IN TERMS OF RESEARCH METHODS

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Abstract

Graduate students are expected to present their research findings in English to earn their degrees, establish academic careers, and contribute to their field of research. Therefore, acquiring the ability to construct research knowledge in disciplinary-oriented ways at an internationally accepted level can be challenging for doctoral students who come from non-English speaking backgrounds. This study examines how non-native speakers of English assessed their own content knowledge of and abilities in research methods while they were earning their credits and writing their dissertations in English. We aimed to find out: (1) how students assessed their abilities for conducting research and presenting research findings in English at the beginning, (2) at the current point of their PhD studies, and (3) if there were significant differences between male and female students and across the four years in their studies. The current study is part of a larger research project using a 1 to 6 Likert scale questionnaire. A questionnaire focused on students' specific knowledge and skills concerning: (1) their own research topic, (2) research design and methodology, (3) finding and analyzing the special literature, (4) designing research instruments, (5) formulating research questions, (6) analyzing data, (7) ability to write publishable papers and their dissertation in appropriate academic English. Participants were 255 doctoral students from 49 different countries, using 52 languages in addition to English, studying at 14 Hungarian universities; 125 were female and 127 were male students. The survey was conducted online in the spring of 2022. Students indicated on a 1 to 6 Likert scale their knowledge and abilities at the start of the PhD program and at the current point of their studies. At the start of the program, from among the seven components, the students agreed with the statement that they had a good knowledge of their own research area ($M=4.08$, $SD=1.36$) and they agreed to a less degree ($M=3.67$, $SD=1.50$) with the statement that they knew how to write a publishable paper in English. At the current point of their studies, participants agreed to a larger degree with the statements that they had a good knowledge of research and writing in English at a publishable level. An independent-sample t-test found significantly higher scores for male participants both at the start and at the current point of their studies on all seven components, indicating that they were more confident about their abilities. As the descriptive statistics tended to show that students were making progress, a paired samples t-test was conducted, and the result confirmed significant differences ($p<.05$). To investigate if there were any differences among the students in the four different years (1st-year, 2nd-year, 3rd-year, 4th-year of PhD program) regarding their perceived abilities of the self-assessed items, one-way ANOVA test was performed, and no significant differences ($p>.05$) were found among their perceptions. We concluded that students' self-perceived research abilities and English academic writing abilities improved as a result of their experiences of research-related activities and courses on research methods throughout their academic years.

Keywords: self-assessments, doctoral students, research methods, research abilities, research knowledge, academic writing.

1 INTRODUCTION

As novice researchers, it is challenging for doctoral students to fully equip themselves with all the required research skills in time so that they can accomplish their whole dissertation in a contract period [1]. Building a good understanding of research procedural steps is literally a complicated process and consequently, graduate students who fail to grasp research knowledge cannot perform their research tasks up to the expected level of their respective programs [2]. Doctoral students have to go through three stages; the very first stage is *conformity knowledge* which is passed from the professor to the student; the second stage is a *capability* which is developed by students in order to cultivate their research practice and the last stage is *becoming and being*, doctoral students become professionals in their own research fields [3]. Even though students need to be provided with enough research

opportunities by respective institutions to a certain extent, it is only students who have to take full responsibility for developing their knowledge about research procedures [4-5].

The ultimate goal of PhD education is to educate students to become efficient researchers who are capable of making valuable contributions to their respective research communities [6-7]. Research students are expected to independently carry out their research works: conducting a quality literature review, developing critical research questions, implementing practically feasible research designs that can effectively answer the research questions, employing advanced research methods and constructing research reports at a scholar-researcher level for presenting the findings of their studies [8-9]. Besides, students are expected to present their research findings in a scientifically accepted manner both to be graduated and to be able to establish an academic career [10]. Therefore, students have to produce their text in English at a publishable level and get their work published in an internationally reputable journal of research and scholarship [11]. As academic writing of scholarly texts requires using specific language features, discourse practices, communicative skills of target academic groups, as well as students' subject-matter knowledge and expertise, writing research reports at the doctoral level belongs to a specialist, theory- and research-informed branch of English language and literacy education [12]. For doctoral students who came from non-English-speaking backgrounds, they have to struggle not just to meet academic English writing requirements but to meet the standards of quality research as well [13]. Studies have highlighted the fact that the research self-efficacy scores of students are directly proportional to their research knowledge, research productivity, and dissertation completion [14-16]. This study aimed to explore how doctoral students studying in Hungary self-assess their abilities to conduct quality research and to write publishable papers and their dissertation in appropriate academic English.

2 METHODOLOGY

2.1 Research questions

The aim of the quantitative large-scale survey was to find answers to five research questions:

- 1 How do doctoral students self-assess the research knowledge they had at the start of their PhD program regarding (a) their own research topic, (b) research design and methodology, (c) finding and analyzing the special literature, (d) designing research instruments, (e) formulating research questions, (f) analyzing data, and (g) their ability to write publishable papers and their dissertation in appropriate academic English.
- 2 How do doctoral students self-assess their research knowledge and writing ability at the current point?
- 3 What is the difference between their self-assessments at the start of the PhD program and now?
- 4 What is the role of gender in the students' self-assessments?
- 5 What is the difference among the self-assessment scores of 1st-, 2nd-, 3rd- and 4th-year PhD students?

2.2 Participants

A total of 255 international and Hungarian doctoral students ($N_{\text{female}}=125$; $N_{\text{male}}=127$; 3 not stated) at 14 universities in Hungary. The students came from 49 different countries; they represented 52 different mother tongues. They studied in 68 PhD programs (1st-year=36.5%; 2nd-year=25.1%; 3rd- year=18%; 4th-year=16.9%; 4+ year=2%; not mentioned=1.6%). Age ranges were 23-25 (4.7%), 26-30 (33.7%), 31-35 (36.9%), 36-40 (12.9%), 41-45 (9%), 46-50 (1.6%), 51-55 (0.8%), and not mentioned (0.2%).

2.3 Data collection instrument

A survey link was created using Google form and the link was sent to the PhD students in Hungary between 2/21/2022 and 4/2/2022. The question items were presented on a 1 to 6 Likert scale (1=Strongly Disagree, 2=Disagree, 3=Slightly Disagree, 4=Slightly Agree, 5=Agree, 6. Strongly Agree). The questions focused on students' self-perceived knowledge and skills concerning (1) their own research topic, (2) research design and methodology, (3) finding and analyzing the special literature, (4) designing research instruments, (5) formulating research questions, (6) analyzing data, (7) ability to write publishable papers and their dissertation in appropriate academic English.

3 RESULTS OF DATA ANALYSIS

3.1 RQ1. Doctoral students' self-assessed research knowledge and writing ability in English at the start of the PhD program

Table 1. Descriptive statistics of students' self-assessments at the start of PhD program (N=255)

<i>When I started the doctoral program, I had a good knowledge of</i>	<i>M</i>	<i>SD</i>
1. my research area	4.08	1.36
2. research design and research methodology	4.04	1.40
3. finding and analyzing the special literature	4.04	1.36
4. designing research instruments	3.69	1.42
5. formulating research questions	3.95	1.32
6. analyzing data	3.84	1.47
7. how to write a publishable paper in English	3.67	1.50

As shown in Table 1, the students tended to agree with the statement that they had a good knowledge of their research area, research design and research methodology, finding and analyzing the literature (Mean range between 4.04 and 4.08 and SD between 1.36 and 1.40). However, regarding the knowledge about designing research instruments, formulating research questions, analyzing data and how to write a publishable paper in English (Mean range between 3.67 and 3.95 and SD between 1.32 and 1.50), students just slightly agreed/agreed to a lesser extent with the statements that they had a good knowledge about them.

3.2 RQ2. Doctoral students' self-assessed research knowledge and writing ability in English at the current point of their PhD studies

Table 2. Descriptive statistics of students' self-assessments at the current point (N=255)

<i>Now, I feel confident that I have a good knowledge of</i>	<i>M</i>	<i>SD</i>
8. my research area	4.89	0.98
9. research design and research methodology	4.82	1.00
10. finding and analyzing the special literature	4.89	0.93
11. designing research instruments	4.67	1.05
12. formulating research questions	4.85	0.95
13. analyzing data	4.65	1.12
14. how to write my dissertation in English	4.73	1.12

As shown in Table 2, the students agreed with the statement that they had a good knowledge of their research area, research design and research methodology, finding and analyzing the literature, designing research instruments, formulating research questions, analyzing data and how to write their dissertation in English (Mean range between 4.65 and 4.89 and SD between .93 and 1.12).

3.3 RQ3. Differences between the students' self-assessment at the start of the PhD program and now

Students' self-assessment scores pertaining to the current point of their studies were higher at than the ones reflecting their self-perception at the start of the PhD program. Therefore, to see whether the differences are statistically different, two-tailed paired-sample *t* tests were conducted (Table 3). Results show that the differences were statistically significant in every case ($p < .001$).

Table 3. "At the start" Versus "Now" Students' Self-assessment Scores

	<i>M</i>	<i>M</i>
<i>Self-assessments</i>	<i>(At the start)</i>	<i>(Now)</i>
1. my research area	4.08	4.89
2. research design and research methodology	4.04	4.82
3. finding and analyzing the special literature	4.04	4.89
4. designing research instruments	3.69	4.67
5. formulating research questions	3.95	4.85
6. analyzing data	3.84	4.65
7. how to write a publishable paper in English vs. how to write a dissertation in English	3.67	4.73

Note. All comparisons were two-tailed, paired-sample *t* tests (*df* = 254).

3.4 RQ4. The role of gender in students' self-assessments

Table 4. Descriptive statistics of self-assessment scores of female and male students

<i>Self-assessed items</i>		<i>M</i>	<i>SD</i>
Research area (at the start)	Female	3.98	1.30
	Male	4.19	1.41
Research design and research methodology (at the start)	Female	3.82	1.48
	Male	4.28	1.27
Finding and analyzing the special literature (at the start)	Female	3.86	1.42
	Male	4.23	1.28
Designing research instruments (at the start)	Female	3.39	1.44
	Male	3.98	1.34
Formulating research questions (at the start)	Female	3.62	1.39
	Male	4.28	1.17
Analyzing data (at the start)	Female	3.47	1.50
	Male	4.20	1.36
How to write a publishable paper in English (at the start)	Female	3.34	1.43
	Male	4.02	1.49
Research area (Now)	Female	4.76	1.04
	Male	5.02	0.92
Research design and research methodology (Now)	Female	4.66	1.09
	Male	4.98	0.88
Finding and analyzing the special literature (Now)	Female	4.79	1.01
	Male	5.00	0.84
Designing research instruments (Now)	Female	4.47	1.16
	Male	4.88	0.90
Formulating research questions (Now)	Female	4.70	1.07
	Male	5.02	0.80
Analyzing data (Now)	Female	4.37	1.25
	Male	4.94	0.91
How to write my dissertation in English (Now)	Female	4.46	1.23
	Male	5.01	0.93

Note. Female=125, Male=127

As shown in Table 4, male students seemed to have assessed their knowledge and ability both at the start of their PhD program and at the current moment higher than their female peers. To see whether the differences were significant, an independent samples t test was conducted. As shown in Table 5, the result of the independent samples t -test confirmed that the differences between female and male students were statistically significant ($p < .05$), except the item research area at the start ($t(250) = -1.246$, $p > .05$).

Table 5. An independent samples t test: Self-assessment scores of female and male students

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Research area (at the start)	Equal variances assumed	1.783	0.183	-1.246	250	0.214	-0.21298	0.17098	-0.54972	0.12376
	Equal variances not assumed			-1.246	249.107	0.214	-0.21298	0.17087	-0.54952	0.12357
Research design and research methodology (at the start)	Equal variances assumed	5.656	0.018	-2.643	250	0.009	-0.45959	0.17387	-0.80203	-0.11715
	Equal variances not assumed			-2.640	243.030	0.009	-0.45959	0.17409	-0.80250	-0.11668
Finding and analyzing the special literature (at the start)	Equal variances assumed	1.495	0.223	-2.139	250	0.033	-0.36435	0.17036	-0.69987	-0.02883
	Equal variances not assumed			-2.137	246.410	0.034	-0.36435	0.17050	-0.70017	-0.02852
Designing research instruments (at the start)	Equal variances assumed	2.106	0.148	-3.386	250	0.001	-0.59225	0.17490	-0.93672	-0.24779
	Equal variances not assumed			-3.384	248.174	0.001	-0.59225	0.17500	-0.93692	-0.24758
Formulating research questions (at the start)	Equal variances assumed	6.932	0.009	-4.082	250	0.000	-0.65946	0.16157	-0.97768	-0.34125
	Equal variances not assumed			-4.076	241.489	0.000	-0.65946	0.16179	-0.97817	-0.34076
Analyzing data (at the start)	Equal variances assumed	4.035	0.046	-4.057	250	0.000	-0.73272	0.18063	-1.08847	-0.37698
	Equal variances not assumed			-4.054	246.992	0.000	-0.73272	0.18076	-1.08876	-0.37669

<i>How to write a publishable paper in English (at the start)</i>	Equal variances assumed	0.003	0.955	-3.694	250	0.000	-0.67962	0.18399	-1.04199	-0.31726
	Equal variances not assumed			-3.695	249.776	0.000	-0.67962	0.18392	-1.04186	-0.31739
<i>Research area (Now)</i>	Equal variances assumed	2.632	0.106	-2.068	250	0.040	-0.25575	0.12364	-0.49926	-0.01223
	Equal variances not assumed			-2.066	244.961	0.040	-0.25575	0.12377	-0.49954	-0.01196
<i>Research design and research methodology (Now)</i>	Equal variances assumed	10.213	0.002	-2.505	250	0.013	-0.31238	0.12468	-0.55793	-0.06682
	Equal variances not assumed			-2.501	237.299	0.013	-0.31238	0.12489	-0.55842	-0.06634
<i>Finding and analyzing the special literature (Now)</i>	Equal variances assumed	5.180	0.024	-1.782	250	0.076	-0.20800	0.11673	-0.43790	0.02190
	Equal variances not assumed			-1.779	240.085	0.076	-0.20800	0.11690	-0.43829	0.02229
<i>Designing research instruments (Now)</i>	Equal variances assumed	9.936	0.002	-3.140	250	0.002	-0.40989	0.13054	-0.66699	-0.15279
	Equal variances not assumed			-3.134	233.182	0.002	-0.40989	0.13081	-0.66760	-0.15218
<i>Formulating research questions (Now)</i>	Equal variances assumed	12.960	0.000	-2.751	250	0.006	-0.32762	0.11909	-0.56218	-0.09307
	Equal variances not assumed			-2.745	229.600	0.007	-0.32762	0.11936	-0.56281	-0.09243
<i>Analyzing data (Now)</i>	Equal variances assumed	20.285	0.000	-4.196	250	0.000	-0.57688	0.13748	-0.84766	-0.30611
	Equal variances not assumed			-4.186	226.828	0.000	-0.57688	0.13782	-0.84845	-0.30531
<i>How to write my dissertation in English (Now)</i>	Equal variances assumed	17.936	0.000	-3.953	250	0.000	-0.54387	0.13758	-0.81483	-0.27292
	Equal variances not assumed			-3.945	230.428	0.000	-0.54387	0.13788	-0.81554	-0.27221

Note. All comparisons were two-tailed, paired-sample *t* tests (*df* = 254).

3.5 RQ5. Comparison of students' self-assessment scores across four different years

According to paired samples statistics (Table 6), it is obvious that students were making progress and senior students tended to score higher than 1st-year PhD students. However, when one-way ANOVA was performed to compare the self-assessed scores across four different years, the result (Table 7) showed that the differences were not statistically significant ($p > .05$).

Table 6. Paired samples statistics across four different years

		1 st year (N=93)	2 nd -year (N=64)	3 rd -year (N=46)	4 th year (N=43)
		<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>
Pair 1	My research area (at the start)	4.28	4.11	3.80	3.98
	My research area (now)	4.71	5.00	4.91	5.09
Pair 2	Research design and research methodology (at the start)	4.29	3.92	3.96	3.88
	Research design and research methodology (now)	4.62	4.84	4.98	5.07
Pair 3	Finding and analyzing the special literature (at the start)	4.22	3.97	3.87	4.05
	Finding and analyzing the special literature (now)	4.75	4.91	5.04	5.02
Pair 4	Designing research instruments (at the start)	3.91	3.66	3.46	3.60
	Designing research instruments (now)	4.44	4.75	4.83	4.91
Pair 5	Formulating research questions (at the start)	4.16	3.95	3.54	3.95
	Formulating research questions (now)	4.71	4.91	4.98	5.02
Pair 6	Analyzing data (at the start)	4.10	3.77	3.65	3.79
	Analyzing data (now)	4.51	4.61	4.76	4.88
Pair 7	How to write a publishable paper in English (at the start)	4.06	3.41	3.20	3.77
	How to write my dissertation in English (now)	4.58	4.66	4.78	5.07

Table 7. One-way ANOVA: Comparison of self-assessment scores across four different years

		Sum of Squares	df	Mean Square	F	Sig.
Research area (now)	Between Groups	7.711	5	1.542	1.613	0.157
	Within Groups	237.991	249	0.956		
	Total	245.702	254			
Research design and research methodology (now)	Between Groups	8.753	5	1.751	1.789	0.115
	Within Groups	243.584	249	0.978		
	Total	252.337	254			
Finding and analyzing the special literature (now)	Between Groups	5.736	5	1.147	1.340	0.248
	Within Groups	213.189	249	0.856		
	Total	218.925	254			
Designing research instruments (now)	Between Groups	8.873	5	1.775	1.630	0.153
	Within Groups	271.111	249	1.089		
	Total	279.984	254			
Formulating research questions (now)	Between Groups	5.128	5	1.026	1.127	0.346
	Within Groups	226.504	249	0.910		
	Total	231.631	254			
Analyzing data (now)	Between Groups	5.612	5	1.122	0.890	0.488
	Within Groups	314.020	249	1.261		
	Total	319.631	254			
How to write my dissertation in English (now)	Between Groups	8.167	5	1.633	1.313	0.259
	Within Groups	309.699	249	1.244		
	Total	317.867	254			

4 DISCUSSION AND CONCLUSION

This study investigated how doctoral students self-assess their knowledge of and skills in research methods and their abilities to publish their work in English at two datapoints: *at the start* of their PhD program and where they *were when the instrument was filled in*. The analysis showed that students' self-assessment scores for the knowledge about their own research area was the highest for both *at the start* of their program and *now* when compared to the other self-assessed items in the study. This outcome indicates that students are most self-assured about their research field. It must be one of the reasons for making progress in their research skills and English academic writing. These findings are in line with previous studies showing that interest in research and self-perceived research skills are significantly correlated [17-18].

Progress in English academic writing is also clearly shown in the analysis of participants' self-assessed scores. Writing abilities are typically mentioned among the dimensions within the research self-efficacy construct [19]. Even though some doctoral programs do not offer academic English writing courses, we assumed that students' writing progress was supported by their constant writing practices such as writing conference presentations, course assignments, journal articles, book chapters, research reports, and dissertations. Respondents' score for English academic writing self-efficacy was the lowest *at the start* of the program. However, for *now*, the score for writing self-efficacy increased in the same way as on self-assessed research skill items. This finding about students' improvement in their writing abilities in English is also in line with previous literature [20-21].

Moreover, the increase in the scores of self-perceived research abilities is also similar to outcomes of previous literature [22], which indicates that students are making progress in developing their research abilities over their years of academic studies. It is logical to infer that students improve their knowledge of research methods while earning course credits in research methodology courses and while engaging in research-related activities during their doctoral education. Youn [23] stated that the ultimate goal of PhD programs is to educate students to become scholar-researchers. The findings of the current study support his statement. Doctoral education provides students with freedom in conducting their research [19]; the participants' responses in this study indicated that they are competent enough to apply learner autonomy; they are self-assured enough not to depend overwhelmingly on guidance. According to the analyses, it is obvious that their experiences related to academic tasks support developing their skills in both research methods and scholarly text production. Additionally, when self-assessed scores concerning *NOW* in the first, second, third, and fourth year of PhD programs were examined, the most junior students' scores tended to be the lowest. We assume that the differences across second, third, and fourth years are not statistically significant due to the sample size of our study.

5 LIMITATIONS

Our study only represents how 255 doctoral students who are studying in 14 different universities of Hungary during the 2021-2022 academic year. Therefore, this finding fails to provide a generalization about doctoral students in Hungary. Moreover, all the participants of this study were from non-English speaking backgrounds. Therefore, the way how these participants assess themselves regarding their ability in writing scholarly English texts at a publishable level might be different from doctoral students of English-speaking backgrounds.

6 FUTURE STEPS

We will explore what strategies students employ to improve their research abilities and English academic writing abilities. While conducting the survey, we invited students to provide their email addresses so that they could be contacted to participate in follow up interviews. After crafting interview questions, the email providers will be invited to participate in semi-structured interviews; the guiding questions will focus on the main challenges they encounter in conducting their research as novice researchers, the obstacles they face as non-native-English-speaking doctoral students when they try to get their work published, how they cope with those challenges and the kind of support they think they need from their respective programs for writing up their papers and dissertations and delivering them on time.

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