

INTERDISCIPLINARY COMPARISON OF POST GRADUATE STUDENTS FOR ACADEMIC WRITING PROFICIENCY IN ENGLISH

¹Sarwar Khaliq, ²Dr Afifa Khanam

ABSTRACT--*The importance of writing skill multiplies as soon as the learners become part of learning communities at higher education level. It is mainly because, the competence level of ESL (English as a second language) students is gauged through their academic writing skill. Their task to prove their worth becomes harder as it demands full command in writing research papers, argumentative essays, term papers, and analysis reports etc. The writing modules are ideally designed and implemented but as far as their outcomes are concerned, they are found mostly unfulfilled. In order to dig out the reasons, many studies are conducted and have reached to the conclusion that the nature of discipline impacts on academic writing style in addition to other multiple reasons. Therefore, a causal comparative study with 3x5 factorial design was employed to investigate the impact of disciplinary factors on the academic writing proficiency in English of postgraduate (PG) learners in a Public Sector university. Taking the population of total 49 disciplines at the university, three of them were selected purposively; Education, Science and Engineering as representatives of major faculties. A test comprised of five major writing skills; Syntactic structure, Lexical features, Paraphrasing, Coherence and Precision, was designed and conducted parallelly on the post graduate students of the three disciplines. The comparison was drawn by applying ANOVA for main effects and interactions of independent variable (discipline) and dependent variable (academic writing skills) were calculated. It was found that significant discrepancies were present in the Academic writing proficiency of the post graduate students due to the diverse nature and needs of their disciplines. The study holds substantial implications for teaching academic writing skills exclusively in diverse disciplines.*

KeyWords--*Academic Writing skills; English as a second language; Interdisciplinary comparison; Postgraduate Students*

I. INTRODUCTION

The ESL learner's literacy growth is determined through multiple language skills. Academic writing is the most challenging proficiency among those skills. Therefore, English language writing skill is incorporated in L2 curriculum, from beginner's level till undergraduate level in the form of Grammar, Syntax, Semantic, vocabulary, comprehension, etc. Thus, writing skill was emerged out as the foremost requirement, followed by other language skills i.e. reading, speaking and then listening.

¹ Research & Evaluation Department, Institute of Education. Lahore College for Women University, Lahore, Pakistan, PC.54000, sarwarkhaliq@hotmail.com

² Research & Evaluation Department, Institute of Education. Lahore College for Women University, Lahore, Pakistan, PC.54000, dr.khanam.wattoo@gmail.com.

Through research, it is observed that complexity of syntactic structures, lexical features and precision varies and increases along with the academic level and discipline variations. It is due to the changing requirements of academic writing at advance level; its level of exactitude and coherence gets amplified to draft a grammatically and thematically complex critique. Zhu [1] also considers growth of academic writing ability especially at university level, as something of great concern. Undoubtedly its importance cannot be compromised, as research articles have to be scripted and then published. Therefore, the writing tasks become more discipline- specific and focused than mere extensive pieces of writing Nesi& Gardner. [2] Academic writing at advance level, is basically an intricate and grammatically complex discourse. As Wright [3] considers chemistry lab reports written by students as “elaborated forms of discourse” to convey certain information through “more complex and explicit representations.”

A study was executed in an Iranian University of Medical Sciences at post graduate level where fifty six students of different disciplines were inquired through semi structured interviews and questionnaires about the relevance and requirement of teaching academic writing across various disciplines and it was found that real complexity of academic writing ability lies within nature of discipline (Dehnad, Bagherzadeh, Bigdeli, Hatami, & Hoseini . [4] Similarly, Munoz-Luna [5] perceives it as “multidisciplinary and challenging activity, where many theories from varied nature converge.”

1.1. Academic writing dimensions

The study focused five major aspects of academic writing:

- Syntactic structure: Sentence structure as per language rules and order of words, Chomsky.[6] Syntax stands for the structure of sentences. In academic writing, types of sentences matter a lot, A paragraph, fabricated with simple sentence structure cannot be categorized as academic piece of writing.
- Lexical features: the knowledge of words’ scope and meaning in order to use range of vocabulary in suitable context Meara.[7] While building an argument, suitable use of vocabulary enhances the real spirit of the polemic wrangles. A word carries and plays varied rolls, depending on the changing context, therefore, complete knowledge of lexical features is unavoidable for drafting an academic piece of writing.
- Paraphrasing: expressing author’s thoughts in one’s own words to enhance clarity and fit to the context Bhagat, & Hovy.[8] While writing research articles and other forms of formal writing, in depth research and references are must to be incorporated. While referring others works, paraphrasing is the basic technique, which is to be mastered. Even for writing a thesis statement, skill of paraphrasing is to be mastered.
- Coherence: The order and sequence of sentences to convey a message logically and relatively for effective comprehension Duggleby.[9] Coherency is the flow of ideas, to be run throughout the document. An academic report, article and other forms of formal writing cannot afford to be haphazard in its thought process and chaotic in its format.
- Precision: Hitting the exact idea and providing to the point material for readers Ševo.[10] Precision is basically the accuracy and correctness of the required information. An academic report cannot fulfill its requirement with its cosmetic get up only, unless it provides the exact details.

1.2. Statement of the problem

The present research intends to investigate: first, the differential writing outcomes of students at post graduate level in different disciplines and secondly, to establish the causal relationship between the discipline specific academic needs and a generalized academic writing teaching priorities. The five indicators: Syntactic structures, Paraphrasing skill, Lexical features, Coherence and Precision were measured to assess the proficiency in writing skills.

1.3. Objectives of the Study

The objectives of the current study were as follows:

1. To measure the writing proficiency of postgraduate students in five dimensions: Syntactic structures, Paraphrasing skill, Lexical features, Coherence and Precision.
2. To compare the cumulative level of writing skills of post graduate students in three distinct disciplines: Science, Arts & Humanities and Engineering.
3. To find the main and interactional effect of particular discipline on the writing proficiency of post graduate students in five dimensions of writing.

1.4. Hypotheses of the study

Keeping the above mentioned objectives in mind, the researcher built the following null hypotheses to test through this study.

Ho1: There is no significant effect of Discipline of Science on the academic writing skill of PG students.

Ho2: There is no significant effect of Discipline of Arts & Humanities on the academic writing skill of PG students.

Ho3: There is no significant effect of Discipline of Engineering on the academic writing skill of PG students.

Ho4: There is no significant effect of nature of discipline on the academic writing skills of the postgraduate students.

Ho5: There is no significant interaction effect of syntactic structure skill and discipline on the academic writing of the PG students.

Ho6: There is no significant interaction effect of Paraphrasing skill and discipline on the academic writing of the PG students.

Ho7: There is no significant interaction effect of Lexical skill and discipline on the academic writing of the PG students.

Ho8: There is no significant interaction effect of Coherence skill and discipline on the academic writing of the PG students.

Ho9: There is no significant interaction effect of Precision skill and discipline on the academic writing of the PG students.

II. LITERATURE REVIEW

Recently disparity across different disciplines have attracted researchers' attention. Many studies have already been conducted; highlighting the importance of teaching of writing at post graduate level, keeping learners' needs

at top priority. In a study carried out by Pourshahian, Gholami, Vaseghi, & Kalajahi [11] the post graduate learners rated teaching of Lexis, grammar and skill of writing as most needed areas in English language learning.

There is an increasing trend in research focusing on variations in academic writing skill across the different disciplines at post graduate level. Since publication of research articles is one of the objectives of academic writing teaching, therefore, the linguistic differences in the publications of varied disciplines have also been traced through research studies. Hyland [12] derived prominent differential indicators of proximity by comparing science articles and research papers published by other disciplines. Similarly, Biber [13] found large variations in institutional writing, syllabi, university courses through their use of features of language (vocabulary, grammar) by using multidimensional analysis. While calculating the differences, Biber & Gray [14] reached to the conclusion that pre-modifying nouns are preferred by specifically science researchers as compared to other social sciences and humanities researcher writers.

Students are found, unable to acquire basic skills, such as comprehension of simple directions and instructions. As Bear, Baldi, and Cook [15] conducted a research on academic skills of college graduates, through the American Institute of Research and reached to the conclusion that almost half of the sample did not have the ability to even handle or balance the checkbooks. In addition, students also face number of difficulties in learning the genre of academic writing due to multiple reasons, drawn from the research, Bartlett; Odell & Swersey. [16]

Staples et al. [17] analyzed four genres: Case studies, Essays, Explanations and Critiques to assess the proficiency level of students in academic writing. The reason behind the variety of genres was that the genre of Essay is comparatively well represented across different disciplines, whereas others are less frequent in certain disciplines. Eighty-nine design qualifications were found in Life and Physical Sciences, three in Social Sciences and only one in the Arts and Humanities was located by Staples et al. [17] This analysis was done on the indicator of the usage of pre-modifying nouns. Therefore, it was revealed that every discipline is having its own academic needs and demands.

III. METHODOLOGY OF THE STUDY

The research was designed in positivistic paradigm with an ex post facto causal comparative method to compare the writing skills of post graduate students in three major disciplines: Science, Arts & Humanities and Engineering. The study was designed in a 3 x 5 Factorial Design. The discipline was taken as independent variable with three factors; Science, Arts & Humanities and Engineering and the dependent variable was academic writing skill with five major dimensions; Syntactic Structure, Lexical Features, Paraphrasing, Coherence and Precision.

Table 1: 3 x 5 Factorial Design of the Ex Post Facto Research

Discipline	Syntactic Structure (SS)	Lexical features (LF)	Paraphrasing (PR)	Coherence (CO)	Precision (PC)
Science	Academic writing score (AWS)	(AWS)	(AWS)	(AWS)	(AWS)

Arts & Humanities	(AWS)	(AWS)	(AWS)	(AWS)	(AWS)
Engineering	(AWS)	(AWS)	(AWS)	(AWS)	(AWS)

3.1. Participants / sample

Thirty participants were randomly selected from each discipline (N=90) from total 2034 postgraduate students of a women university at district Lahore, Pakistan. All participants were of same gender (female). Their age group ranged from 22-25 years. All three groups of students were enrolled in MS programs (after 16 years of education), in the same public university for women.

3.2. Instrument

A comprehensive academic writing skill competency test was designed as an instrument to test the hypotheses of the study. A test for assessing writing skills having 50 marks; 10 marks for each skill (Syntactic structures, Paraphrasing skill, Lexical features, Coherence and Precision) was constructed and applied to the participants after validation. The cumulative reliability coefficient was $\alpha = .759$.

3.3. Procedure

After securing permission from the registrar of the university, the researcher conducted and supervised the test herself in the respective departments. A 3x5 factorial design was used to compare 3 groups on 5 skills of writing. The students of three above mentioned, disciplines were tested on the five dimensions: Syntactic structures, Paraphrasing skill, Lexical features, Coherence and Precision. A proficiency test for assessing writing skills having 50 marks; 10 marks for each skill (Syntactic structures, Paraphrasing skill, Lexical features, Coherence and Precision) was constructed and applied to the participants after validation.

3.4. The Conceptual Framework of the Study

The study was conducted by following the plan as given below:

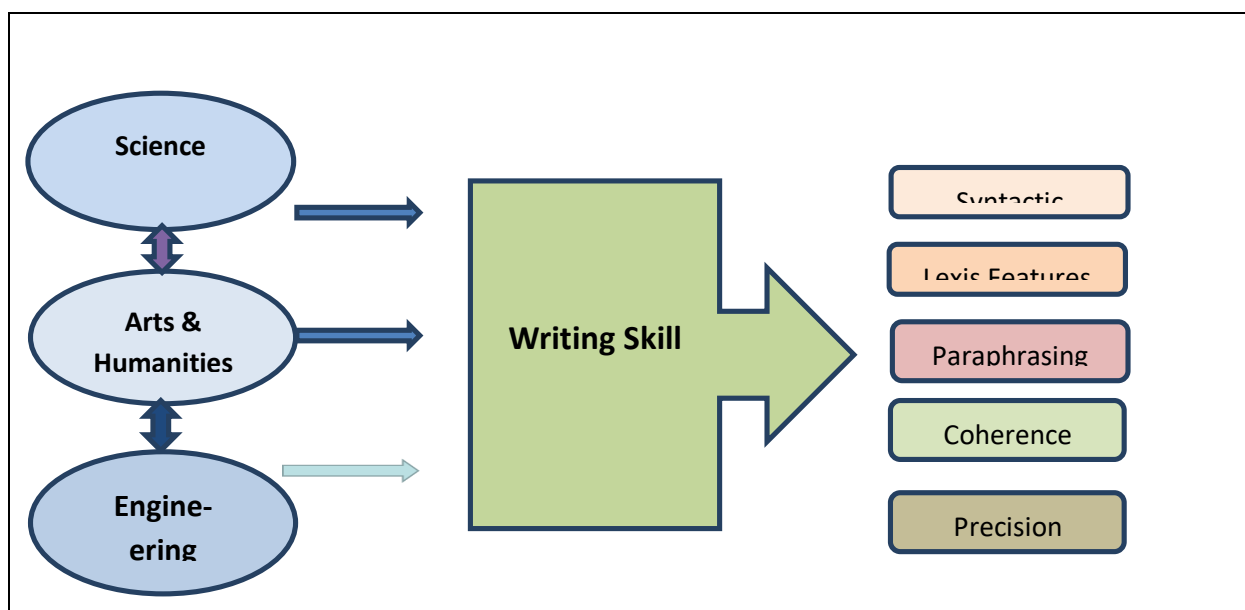


Figure1: Conceptual framework of the study

3.5. Data Analysis

The data obtained on interval scale for three groups on five skills were analyzed through one-way ANOVA. The three main effects and interactional effects of academic discipline and academic writing skills were calculated by ANOVA and Tukey's HSD and LSD test.

IV. RESULTS AND FINDINGS

Table 2: Mean score of postgraduate students from three disciplines on five academic writingskills

Writing skill	Science	Arts &Huminites	Engineering
Syntactic structures	4.5	3.1	7.26
Paraphrasing skill	3.6	3.6	5.16
Lexical Features	7.26	5.53	7.06
Coherence	2.63	3.06	4.93
Precision	2.56	3.46	5.06
Overall proficiency	4.11	3.75	5.9

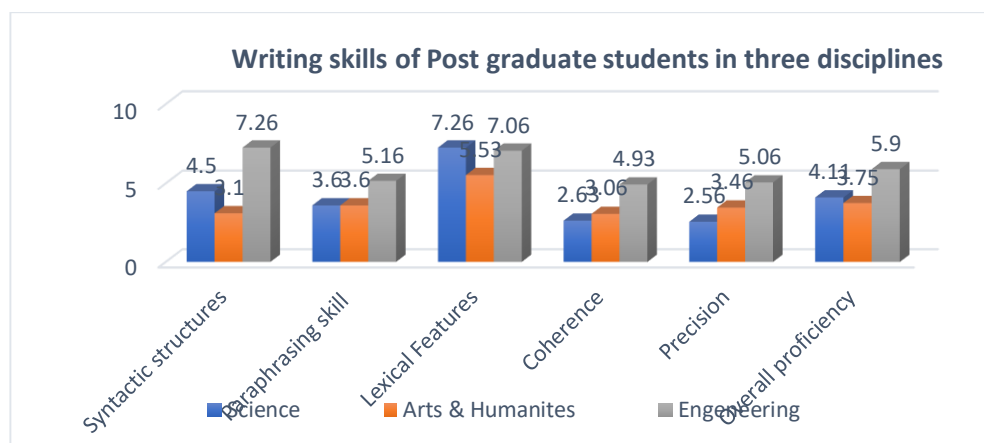


Figure 2: Writing Skills of Post graduate students in three disciplines

The Table 2 and figure 2. show that postgraduate students of three disciplines have comparatively high proficiency in lexical features as compared to the other skills. The students from engineering were better in Syntactic structure in comparison with students of Arts & Humanities and Science. Students from the field of Engineering showed highest writing proficiency regarding all writing skills. Overall, the postgraduate students from Engineering showed the highest command, the Science students at the second place and the students from Arts & Humanities exhibited least proficiency in academic writing skills.

Table 2: Comparison of Postgraduate students of three disciplines in five writing skills through ANOVA

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Syntactic structures	Between Groups	269.756	2	134.878	31.709	.000
	Within Groups	370.067	87	4.254		
	Total	639.822	89			
Paraphrasing skill	Between Groups	49.089	2	24.544	7.504	.001
	Within Groups	284.567	87	3.271		
	Total	333.656	89			
Lexical Features	Between Groups	53.956	2	26.978	21.493	.000
	Within Groups	109.200	87	1.255		
	Total	163.156	89			
Coherence	Between Groups	89.622	2	44.811	30.770	.000
	Within Groups	126.700	87	1.456		
	Total	216.322	89			

	Total	216.322	89			
Precision	Between	96.200	2	48.100	33.028	.000
	Groups					
	Within Groups	126.700	87	1.456		
	Total	222.900	89			

Table 3 describes that all of the three groups of postgraduate students were significantly different from each other which means that nature of discipline has a substantial effect on the writing skills of postgraduate students i.e. the three groups were different in having syntactic structure skill with $F(2,87)=31.709$, $p = .000$. The groups were significantly different in paraphrasing skill with $F(2, 87) = 7.504$, $p = .001$. Likewise, the three groups exhibited differential performance in lexical features with $F(2, 87) = 21.493$, $p = .000$. There was a significant difference in developing coherent writing among three groups as demonstrated by *one-way ANOVA* $F(2,87) = 30.770$, $p = .000$. The groups from three disciplines had also significant differentiated precision skill with $F(2, 87) = 33.028$, $p = .000$. The results above have rejected null hypotheses from 1 to 3 with sufficient evidence. All of the three disciplines have significant effect on the academic writing skills of post graduate students.

Table 3: Tukey's HSD (Honest Significant Difference) test for group comparison

Dependent Variable	(I) Academic disciplines	(J) Academic disciplines	Mean Difference (I-J)	Std. Error	Sig.
Syntactic structures	Science	Arts and Humanities	1.40000*	.53252	.027
		Engineering & Technology	-2.76667*	.53252	.000
	Arts and Humanities	Science	-1.40000*	.53252	.027
		Engineering & Technology	-4.16667*	.53252	.000
	Engineering & Technology	Science	2.76667*	.53252	.000
		Arts and Humanities	4.16667*	.53252	.000
Paraphrasing skill	Science	Arts and Humanities	.00000	.46697	1.000
		Engineering & Technology	-1.56667*	.46697	.003
	Arts and Humanities	Science	.00000	.46697	1.000
		Engineering & Technology	-1.56667*	.46697	.003

	Engineering& Technology	Science	1.56667*	.46697	.003
		Arts and Humanities	1.56667*	.46697	.003
Lexical Features	Science	Arts and Humanities	1.73333*	.28927	.000
		Engineering& Technology	.20000	.28927	.769
	Arts and Humanities	Science	-1.73333*	.28927	.000
		Engineering& Technology	-1.53333*	.28927	.000
	Engineering& Technology	Science	-.20000	.28927	.769
		Arts and Humanities	1.53333*	.28927	.000
Coherence	Science	Arts and Humanities	-.43333	.31159	.350
		Engineering& Technology	-2.30000*	.31159	.000
	Arts and Humanities	Science	.43333	.31159	.350
		Engineering& Technology	-1.86667*	.31159	.000
	Engineering& Technology	Science	2.30000*	.31159	.000
		Arts and Humanities	1.86667*	.31159	.000
Precision	Science	Arts and Humanities	-.90000*	.31159	.013
		Engineering& Technology	-2.50000*	.31159	.000
	Arts and Humanities	Science	.90000*	.31159	.013
		Engineering& Technology	-1.60000*	.31159	.000
	Engineering& Technology	Science	2.50000*	.31159	.000
		Arts and Humanities	1.60000*	.31159	.000

Table 3 indicates Post Hoc comparisons of postgraduate students from three disciplines. The results show that the Engineering group was able to perform significantly better in syntactic structure than science and Arts group with ($p = .027$) and ($p = .000$). However, the Science and Arts groups were significantly similar with ($p = 1.00$) while Engineering group performed better than the two groups with ($p = .003$) in paraphrasing skill. In lexical features, both Engineering and Science groups performed equally better with ($p = .769$) than the Arts group with ($p = .000$). However, for coherence, the Science and Arts groups were approximately same with ($p = .350$) and were significantly weaker from Engineering group with ($p = .000$). Finally, the three groups were significantly different from each other with ($p = .013$) and ($p = .000$) in writing precisely. The results above have rejected null hypotheses; 5th, 7th, 8th and 9th with enough evidence. All of the skills and disciplines have significant interaction effects on the academic writing skills' scores of post graduate students except 6th null hypothesis which is accepted because all of the three groups are weak in paraphrasing skill almost equally.

4.1. Findings

- It was found that all of the three groups of postgraduate students were significantly different from each other which means that nature of discipline has a substantial effect on the writing skills of postgraduate students.
- The three groups were different in having syntactic structure skill.
- The groups were significantly different in paraphrasing skill.
- All the three groups exhibited differential performance in lexical features.
- There was a significant difference in developing coherent writing among three groups.
- The groups from three disciplines had also significant differentiated precision skills.
- The results show that the Engineering group was able to perform significantly better in syntactic structure than science and Arts group.
- The Science and Arts groups were significantly similar regarding syntactic structure.
- The Engineering group performed better than the two groups within paraphrasing skill.
- In lexical features, both Engineering and Science groups performed equally better than the Arts group with regarding coherence, the Science and Arts groups were approximately same and were significantly weaker from Engineering group.
- The three groups were significantly different from each other in writing precisely.
- All of the skills and disciplines have significant interaction effects on the academic writing skills' scores of post graduate students except paraphrasing where all of the three groups were weak.
- The postgraduate students belonging to different disciplines were significantly different on each writing skill except paraphrasing and coherence to some extent.
- Students from Science and Engineering were equally good in Lexical features of writing.
- Discipline influences all dimensions of writing in one way or the other.

5.2 Conclusion

It is therefore, concluded, that students do carry the previously acquired knowledge and skills along with them while entering the highly demanding and discipline specific post graduate level of learning. They bring learning habits from other disciplines, which are usually not compatible with the needs of the presently joined field of the

study. For example, learners, who own the background of the discipline of English Literature are usually good in creative writing with all its expressiveness, which is certainly not required in the context of the discipline of Engineering and Technology. In fact, brevity and conciseness is the need of disciplines linked with the paradigm of technical knowledge. Even the style of formatting varies with the varied disciplines.

To sum up, students should definitely acquire writing skills identified in the current study and supports Pourbahram's [18] study who identified need of learning academic writing components. Students from Science and Arts groups were equally weak in coherence in their writing. The results are in accordance, to some extent, with the findings of the study carried by Gholami, et al. [11] who advocated that students of science and technical subjects have better critical thinking skills as compared to art students. Their study concluded that the knowledge of vocabulary, grammar, coherence Ševo, [10] and skill of paraphrasing are the most essential needs of language learners in technical subjects.

It is advisable that the students should be given enough practice in the integration and application of the acquired discipline specific skill of writing. This is how they will automatically develop fluency accuracy in performing both simple and complex tasks of academic writing. Gradually, they will learn what, how and when to apply the discipline oriented writing knowledge and skill effectively.

5.3 Implications of the findings

- The study holds important implications for setting priorities to teach writing skills in different disciplines and deciding appropriate strategies to enhance cumulative academic proficiency. Since the researchers in this study have used 3x5 factorial design, therefore, the specific needs analysis with respect to different disciplines of post graduate learners can bring efficient implications to the teachers, ESL curriculum developers and postgraduate learners. The instructors can always rethink and revamp their plans to bring changes into their teaching objectives, outcomes and pedagogical styles to meet the discipline-oriented requirements, being highlighted in this study. Textbook authors can also make use of the data provided in the current study to make books more useful and result oriented.

- The findings of the current study have not only invoked the role of discipline related need analysis but have proved and provided the basic data and evidence that how different disciplines have varied needs and requirements. Therefore, the ESL course designers can get guidelines from this study as this research sheds more light on current postgraduate language learners' academic needs in the context of Academic writing skill.

- No doubt this study is highly significant and holds serious propositions. By assessing the present capability of post graduate learners, their current language proficiency and the gaps in upcoming academic challenges, can better guide the course designers and instructors to be discipline specific and need oriented.

5.2 The findings of the study lead towards the following recommendations:

- The EFL instructors should focus coherence in the text in all disciplines while teaching academic writing skills.
- Students from all disciplines need to be practiced paraphrasing rigorously for effective writing skills.
- Students from sciences need to be guided for considering coherence and precision in their writing style.
- Post graduate students from all disciplines need to be taught by specifically trained instructors.

- Sufficient academic writing courses are required for research students to get proficiency in all dimensions of writing.
- The better academic writing potential will emerge only by more cautious, more careful and more focused writing modules will be designed and then implemented.
- The findings derived from the current study have serious implications for further research on language disparity and deviations due to different disciplines within academic writing in particular.

REFERENCES

1. Zhu, J., Rosset, S., Tibshirani, R., & Hastie, T. J. (2004). 1-norm support vector machines. In *Advances in neural information processing systems* (pp. 49-56).
2. Nesi, H., & Gardner, S. (2012). *Genres across the disciplines: Student writing in higher education*. Cambridge University Press.
3. Wright, L. J. (2008). Writing science and objectification: Selecting, organizing, and decontextualizing knowledge. *Linguistics and Education*, 19(3), 265-293.
4. Dehnad, A., Bagherzadeh, R., Bigdeli, Sh., Hatami, K., & Hoseini, F., (2010). Syllabus revision: a needs analysis study. *Procedia Social and Behavioral Sciences*, 9, 1307-1312.
5. Munoz-Luna, R. (2015). Main ingredients for success in L2 academic writing: Outlining, drafting and proofreading. *PloS one*, 10(6), e0128309.
6. Chomsky, N. (1956). Three models for the description of language. *IRE Transactions on information theory*, 2(3), 113-124.
7. Meara, P. (2005). Lexical frequency profiles: A Monte Carlo analysis. *Applied linguistics*, 26(1), 32-47.
8. Bhagat, R., & Hovy, E. (2013). What is a paraphrase?. *Computational Linguistics*, 39(3), 463-472.
9. Duggleby, S. J., Tang, W., & Kuo-Newhouse, A. (2016). Does the Use of Connective Words in Written Assessments Predict High School Students' Reading and Writing Achievement? *Reading Psychology*, 37(4), 511-532.
10. Ševo, I., & Avramović, A. (2016). Convolutional neural network based automatic object detection on aerial images. *IEEE geoscience and remote sensing letters*, 13(5), 740-744.
11. Pourshahian, B., Gholami, R., Vaseghi, R., & Rezvani Kalajahi, S. A. (2012). Needs of an ESL context: A case study of Iranian graduate students. *World Applied Sciences Journal*, 17(7), 870-873. 2581-4281 Vol).
12. Hyland, K. (2006). Disciplinary differences: Language variation in academic discourses. In K. Hyland & M. Bondi, (Eds.), *Academic Discourse across Disciplines* (pp. 17-45). Frankfurt, Germany: Peter Lang.
13. Biber, D. (2006). *University language: A corpus-based study of spoken and written registers* (Vol. 23). John Benjamins Publishing.
14. Biber, D., & Gray, B. (2010). Challenging stereotypes about academic writing: Complexity, elaboration, explicitness. *Journal of English for Academic Purposes*, 9(1), 2-20. DOI: 10.1016/j.jeap.2010.01.001
15. Baer, J.D., Cook, A.L. and Baldi, S. (2006). *The literacy of America's college students*. Washington, DC: American Institutes for Research.
16. Bartlett, T. (2003). Why Johnny can't write, even though he went to Princeton. *Chronicle of Higher Education*, 49 (17), A39-A40.

17. Staples, S., Egbert, J., Biber, D., & Gray, B. (2016). Academic writing development at the university level: Phrasal and clausal complexity across level of study, discipline, and genre. *Written Communication*, 33(2), 149-183.
18. Pourbahram, S. M. R. (2018). *An Interdisciplinary Assessment Of Needs In Esp (Doctoral dissertation, Ph. D Degrees Explored. International Journal of Advanced Multidisciplinary Scientific Research (IJAMSR) ISSN: 2581-4281 Vol).*