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RESEARCH PAPER

Analyzing Academic English Writing Needs of Natural Sciences Researchers

¹Javeria Akhtar and ²Dr. Iram Rubab*

1. MS Scholar, Department of English, GC Women University Sialkot, Punjab, Pakistan
2. Assistant Professor, Department of English, GC Women University Sialkot, Punjab, Pakistan

| Corresponding Author | iram.rubab@gcwus.edu.pk |

ABSTRACT

The aim of present study is to investigate the needs of English writing skills of MS Researchers of Natural Sciences disciplines of Sialkot to achieve the targets. Insights for the undertaken study were taken from the theory of Needs Analysis Hutchinson & Walters (1987). In this regard, researchers from three departments were considered: Department of Physics, Department of Chemistry and Department of Zoology. To judge the existing situation of researchers' competence, questionnaire was used as an instrument. The questionnaire was comprised of two sections: Target Situation Analysis and Present Situation Analysis; was given to all researchers (n=120) of these departments. Findings reflect the existing situation of the researchers regarding writing skills is not satisfactory to cope up the research based activities. To overcome this problem, they are in need of EAP course to improve their writing skills.

| **Keywords:** | Academic Writing, Needs Analysis, EAP Writing Course |

Introduction

In the multilingual state of Pakistan, English is recognized as the official language. Enhancing one's self-image and self-confidence is largely facilitated by English. It is important to boost the quality of education by making it the only medium of instruction in institutions. According to Rubab (2017), English has gained significant value in Pakistan and is utilized in higher education and white-collar occupations. Among Pakistanis with higher education, speaking English has become a polite and dignified way to connect; those who can speak it are seen as intelligent. English as a second language in Pakistan has had an important educational and economic impact. Most of the Pakistani students need to acquire English for practical purposes, including travel, reading highly technical literature, surviving university classes, having access to foreign publications and periodicals, landing good employment, and using it as the working language of their future professions (Mansoor, 1993). Over the last few years, for a number of different reasons, English has become more important in Pakistani higher education institutions. Rubab et al (2020) asserts that in order to pursue higher education in Pakistan, pupils must be proficient in the English language. As a result, rather of serving as a single subject, it needs to be the primary medium of instruction.

The situation of researchers in higher education is not satisfactory as claimed by Fiaz & Rubab (2024). They do not focus on their writings. They lack reading skills. Reading skill is one of the most important skills that lead to better write up. The reasons behind their bad situation are: they do not focus on reading skills and writing skills, they come from diversified academic backgrounds, they do not focus on the formal structure of language etc. This study mainly focuses on analyzing the academic English writing skills of MS Researchers of Natural Sciences. It has been revealed by the stakeholders that they are facing problems and issues while writing their theses. They face many problems of grammar, vocabulary, punctuation, tenses etc as claimed by Ashraf et al (2020), they nvestigated the problems of postgraduate students in their writing skills. Writing a thesis

demands proper use of grammar, vocabulary, punctuation, tenses, cohesive and coherence links etc. Often researchers find this a tiresome job to revise and edit their research dissertation because they don't take interest. Thus there is a need to design an EAP course to fulfill their needs and to improve academic writing skills of researchers. The present study aims to investigate their problems of Natural Sciences researchers' writing and factors that hinder their writing skills.

It is reported by the stakeholders, the researchers of Natural Sciences Departments do not have required proficiency in writing skills to cope up the research based activities regarding writing tasks, reports writing and theses writing. They feel difficulty in coping up the academic writing tasks concerned with research. Taking the insights from needs analysis, the issues regarding writing skills faced by the natural sciences researchers have been investigated under the shed of needs analysis to observe the difference between present situation and target situation analysis. And then, a course have been crafted for Natural Sciences Researchers to fulfil the gap. This study is the process of designing an EAP course under the researchers' needs to write up their theses. Taking the insights from the theory of Needs Analysis by Hutchinson & Walters (1987) regarding undertaken study, following hypotheses have been generate d:

Literature Review

The concept of English for Academic Purposes (EAP) first arose in 1974 and became widely recognized in 1975. The old group of the British Association of Lecturers in English for Academic Purposes (BALEAP) in Britain raised the issue of developing EAP instructions at the higher educational level in 1989. English for Academic Purposes (EAP) has been taught in a variety of contexts. English may be referred to as a foreign language (EFL) in some academic levels, such as those in Germany and Finland, or as a second language (ESL), such as when it is used as the official or primary language of teaching in universities or schools. The EAP curriculum may be essential for higher education in regions where English has been spoken as the native tongue, for example, if all skills are needed for academic contexts (Jordan, 1997). EAP was described by Jordan as 'in educational system English language is required for communication skills' (Jordan, 1997). The most common definition of English for Academic Purposes is 'the goal of teaching English is to make it easier for students to study or conduct research in particular language' (Flowerdew & Peacock, 2001).

Li & Fu (2021) conducted a research on English language needs for Business and Engineering Students of Chinese Local University. In their study, Needs analysis was carried out for crafting for an ESP course for them. The authors sought to determine the relationship between existing situation and target situations of students' specific needs required for designing ESP course. The linguistic Needs were examined to craft ESP courses for students majoring in Business and Engineering.

Basari (2018) executed a research on academic writing for the university students. In order to explore academic writings skills at a public institution in Malaysia, this study made an attempt to merge two needs analysis models: Robinson's (1991) needs analysis and Benesch's (2001) rights analysis. Benesch (1999) executed a research in order to determine the primary techniques for the content of ESP/EAP curriculum, in light of needs analysis with the help of questionnaires and interviews. It was helpful for the academic writing requirements of the students. Numerous researches in the field of ESP/EAP have been executed in Pakistan with regard to the fields of banking, medical engineering, agriculture, commerce, business, and advertising, among others. Ahmad (2005) carried out a study to examine postgraduate students' requirements for academic language. An investigation into the topic entitled "*A case for ESP: Legal English*". The researcher determined the issues encountered by Pakistani law students as well as their current level of language proficiency with the help of survey method.

Rubab, et al (2019), (2014) conducted a study on Academic English Language for Social Sciences in Bahauddin Zakariya University, Multan. The goal of the study was to identify the academic English language needs of social sciences students at Bahauddin Zakariya University, Multan, and to recommend a course to meet those needs. On the other hand, Rubab, et al (2020), conducted a research on analyzing Social Sciences Students' listening skills in EAP classroom settings. The literature study demonstrates that since the inception of EAP, a lot of work has been done in the domain of needs analysis. Additionally, it has been noted that Pakistan's numerous disciplines have conducted needs analyses. However, investigation of academic language needs of Natural Sciences was not carried out. The purpose of this study is to address this gap.

Hypothesis -1

H0: There is no association between the present needs and target needs of researchers in use of grammar in writing a research thesis.

H1: There is association between the present needs and target needs of researchers in use of grammar in writing a research thesis.

Hypothesis -2

H0: There is no association between the present needs and target needs of researchers in proper use of tenses.

H1: There is association between the present needs and target needs of researchers in proper use of tenses.

Hypothesis -3

H0: There is no association between the present needs and target needs of researchers on having excellent grip on writing skills.

H1: There is association between the present needs and target needs of researchers on having excellent grip on writing skills.

Hypothesis -4

H0: There is no association between the present needs and target needs of researchers to join some EAP writing course to improve formal written discourse skill.

H1: There is association between the present needs and target needs of researchers to join some EAP writing course to improve formal written discourse skill.

Hypothesis -5

H0: There is no association between the present needs and target needs of researchers in use of high vocabulary while writing their thesis.

H1: There is association between the present needs and target needs of researchers in use of high vocabulary while writing their thesis.

Material and Methods

The study is descriptive in nature. The aim of the study is to execute the present and target situations analysis of the Natural Sciences researchers regarding writing skills. A survey technique was used to gather the data regarding the undertaken study which was quantitatively analyzed through SPSS software to describe the findings of the study. In this

regard, the questionnaire was generated in relation to the Language needs of researchers of Natural Sciences which was comprised of 30 statements; out of which, 15 were concerned with Target Situation Analysis (TSA) and 15 were related to Present Situation Analysis (PSA). Both sections of the questionnaire were associated to each other. So, the data was collected from two universities which were offering MS program of Natural Sciences in Sialkot District: *Government College Women University Sialkot (GCWUS) and University of Sialkot (USKT).* Three departments of each universities were included as follows: Department of Chemistry, Department of Physics and Department of Zoology. Total number of participants were was one hundred and twenty; twenty students from each department of both universities. As the questionnaire was comprised of two sections. To describe this association between Target Situation Analysis and Present Situation Analysis of the researcher; descriptive analysis was done through SPSS. In this context, first the reliability of the questionnaire was measured through cronbach Alpha test as given below:

Table 1
Representing Reliability Test

QUESTIONNAIRS	ALPHA
TSA	.749
PSA	.760

The first section of the questionnaire regarding *Present Situation Analysis (PSA)* presents Cronbach Alpha (.760), which is satisfactory. On the other hand, second section of the questionnaire *Target Situation Analysis (TSA)* presents Cronbach Alpha (.749) which is also considered good as mentioned in table 1.

Results and Discussion

Quantitative analysis of data regarding questionnaire has been described. The questionnaire was comprised of two parts. First fifteen statements belong to Target Situation analysis (TSA) and the rest fifteen statements belong to Present Situation analysis (PSA). The association between both sections of questionnaire has been measured through SPSS as given below:

Statistical Description of Questionnaire

The statistical description of the questionnaire regarding items of questionnaire, which are concerned with the TSA and PSA are presented below:

Table 2
Presenting the mean and standard deviation of TSA

Sr. No	Statements	Mean	Std. Deviation
1	Writing a research thesis demands accurate use of grammar	2.050	1.1871
2	To write a research dissertation need developing excellent grammatical and lexical linkages in thesis	2.395	1.2158
3	Writing a research thesis demands proper use of tenses	1.924	1.1335
4	Writing a research thesis demands use of high vocabulary	3.733	.9850
5	To write a research thesis requires creating relations in meanings within and between sentences	1.633	.9069
6	Writing a research thesis requires presenting cause and effect and comparison and contrast in drafting	1.425	.8165
7	Clarity of thoughts in research dissertation requires linkage in ideas, sections, beginnings and ends and paragraphs	1.667	.8435
8	Writing a research thesis requires skills of revising to create textual flow	1.617	.8115
9	Writing a research thesis demands creating appropriate structure of sentences	1.517	.8980
10	Writing a research thesis demands appropriate use of punctuation	1.458	.7981
11	The requirement of a research desertion is to be skillful in using cohesive and coherence links	2.108	1.1137

12	Writing a research thesis needs developing smooth flow of paragraphs	3.075	1.1535
13	The linkage between old and new information needs in writing a research thesis	2.575	1.1715
14	Writing a good research thesis needs an excellent grip on writing skills	1.550	.7316
15	There is a need to offer an academic writing course with a special focus on writing needs of researchers	1.725	.8398

The above table presents the mean and standard deviation of questionnaire regarding target situation analysis. This questionnaire consists of fifteen items. Each statement is described separately with statistical data.

Table 3
Presenting the mean and standard deviation of PSA

Sr. No	Statements	Mean	Std. Deviation
1	I have excellent grip on writing skills.	4.142	.7917
2	I, as a researcher, can create cohesive and coherence links in writing a thesis.	4.458	.6723
3	I, as a researcher, can develop proper grammatical and lexical linkages in writing	3.242	1.2299
4	I, as a researcher can develop smooth flow between sentences and paragraphs in writing a thesis	4.125	.8154
5	I, as a researcher write effective sentences and paragraphs, using correct grammar, punctuation, and spelling.	2.475	1.0921
6	I, as a researcher give almost equal attention to both the language (e.g. spelling. grammar. vocabulary) and the content (e.g. ideas, organization).	2.675	1.1822
7	I, as a researcher can write with clarity of thought via relating ideas, sections, beginnings and ends	4.150	.8060
8	I, as a researcher can create textual flow	1.650	.5891
9	I, as a researcher find revising and editing of draft to be very tiresome job	4.183	.6078
10	I, as a researcher can draft research process in a unified manner	3.550	.9601
11	I, as a researcher can organize and clarify ideas in my thesis	2.008	.6920
12	I require professional help of an expert user of English language to check my thesis draft for cohesiveness and coherency	4.251	.5034
13	I, as a researcher use a well-defined structure (introduction, body, and conclusion) in my writing, as appropriate.	2.017	.9437
14	I, as a researcher can write evenly from one paragraph to another	2.900	1.2050
15	I, as a researcher shall join some EAP writing course to improve formal written discourse skill	1.900	.8034

The above table presents the mean and standard deviation of questionnaire regarding present situation analysis. This questionnaire consists of fifteen items. Each statement is described separately with statistical data.

Comparative analysis of questionnaire

The statistical description of the questionnaire regarding TSA and PSA, which are concerned with required and current situation of MS Natural Sciences researchers has been given below in tables

Table 4
Overall average descriptive analysis of questionnaire regarding TSA & PSA

	TSA	PSA
Mean	1.9533	3.1728
St. Deviation	0.86542	0.881413

Findings

Overall average descriptive analysis of questionnaire regarding TSA & PSA

Table 4 presents the mean and standard deviation of average responses collected from researchers. There is a distinctive variation with significant difference between their perceptions of target situation analysis and present situation analysis. Thus, researchers lack textual competence and cannot maintain cohesion and coherence in their writings. This finding is most relevant to the findings of Khan & Ghani (2021). The current level of textual incompetence among researchers may indicate their English proficiency to be narrow. Researchers believe that there is a dire need for researchers to join a separate academic writing course to get their written competence enhanced; thus, the course needs to be designed and offered to them in future.

Association between TSA and PSA Questionnaire

Hypothesis -1

H0: There is no association between the present needs and target needs of researchers in use of grammar in writing a research thesis.

H1: There is association between the present needs and target needs of researchers in use of grammar in writing a research thesis.

Significance level =.05, Test Statistics: Chi-square = 29.679 with degree of freedom (r-1) (c-1) P-Value: 0.02

Since the calculated value of chi square is 29.679 which is significant as p-value is 0.02. So we cannot accept Ho. Therefor there is association between the present needs and target needs of researchers in use of grammar in writing a research thesis.

Hypothesis -2

H0: There is no association between the present needs and target needs of researchers in proper use of tenses.

H1: There is association between the present needs and target needs of researchers in proper use of tenses.

Significance level: =.05 Test Statistics: Chi-square = 37.208 with degree of freedom (r-1) (c-1) P-Value: 0.002

Since the calculated value of chi square is 37.208 which is significant as p-value is 0.002. So we cannot accept Ho. Therefor there is association between the present needs and target needs of researchers in proper use of tenses.

Hypothesis -3

H0: There is no association between the present needs and target needs of researchers on having excellent grip on writing skills.

H1: There is association between the present needs and target needs of researchers on having excellent grip on writing skills.

Significance level: =.05 Test Statistics: Chi Square= 31.240   With degree of freedom (r-1) (c-1), P-Value: 0.013

Since the calculated value of chi square is 31.240 which is significant as p-value is 0.013. So we cannot accept Ho. Therefor there is association between the present needs and target needs of researchers on having excellent grip on writing skills.

Hypothesis -4

H0: There is no association between the present needs and target needs of researchers to join some EAP writing course to improve formal written discourse skill.

H1: There is association between the present needs and target needs of researchers to join some EAP writing course to improve formal written discourse skill.

Significance level: =.05, Test Statistics: Chi Square = 36.402, with degree of freedom (r-1) (c-1), P-Value: 0.003

Since the calculated value of chi square is 36.406 which is significant as p-value is 0.003. So we cannot accept Ho. Therefor there is association between present needs and target needs of researchers to join some EAP writing course to improve formal written discourse skill.

Hypothesis -5

H0: There is no association between the present needs and target needs of researchers in use of high vocabulary while writing their thesis.

H1: There is association between the present needs and target needs of researchers in use of high vocabulary while writing their thesis.

Significance level: = .05, Test Statistics: Chi Square = 21.220   with degree of freedom (r-1) (c-1), P-Value: 0.0170

Since the calculated value of chi square is 21.220 which is insignificant as p-value is 0.170. So we accept Ho. Therefor there is no association between the present needs and target needs of researchers in use of high vocabulary while writing their thesis.

The current study has examined researchers' below average textual competency prevents them from connecting words and ideas when writing a dissertation or thesis. The use of grammar, vocabulary, punctuation, tenses, cohesion and coherence in the text is not appropriate. They lack academic writing skills. Thus, the results show that there is a need to help researchers to complete their significant tasks of "write up" of their respective dissertations or theses; an EAP academic writing course needs to be developed. Researchers lack textual competence and cannot maintain cohesion and coherence in their writings. The findings of Ahmad et al. (2019), M. Ahmed (2010), and Jat et al. (2019) are most relevant to this finding. Thus, there is a dire need to develop the course for researchers to meet their needs.

Conclusion

The goal of the present research was to identify the writing needs of Natural Sciences Researchers in Sialkot, Pakistan. Natural sciences researchers struggle to write coherent theses. The current study has investigated how poor textual competency among researchers prevents them from connecting words and ideas during writing their theses. Hypotheses has been justified, there is a direct association between *Present Situation Analysis* and *Target Situation Analysis*. It reflects the difference between them that leads to

develop a dire need to develop a course for the researchers to meet their needs. In this regard, following EAP course has been designed for the Natural Sciences Researchers to meet their needs:

Course Design

Description of Course

Research Writing has always been a significant task in academic field. Academic writing has a vital role in research writing. In higher studies, academic writing always been the matter of increasing focus by numerous students. The significance of academic writing has driven several researches in the field of learning, teaching and English for academic Purposes (EAP) as well. This EAP writing course has specially designed for MS Researchers of Natural Sciences. The course assumes a basic understanding of Standard English grammar and the conventions of academic writing. This course consists of basic needs of researchers. This course has specific aims and objectives. The course will be very helpful for the researchers to write their research activities.

Objectives of Course

By the end of the course:

• Researchers will be able to write any research dissertation.

• Researchers will be able to write correct grammatical structures, appropriate vocabulary, organization, content, and language use.

Course Outlines

Course topics will include the following:

Section I: Mechanics of Writing

- Tenses
- Parts of speech
- Moods (indicative, imperative, subjunctive)
- Voice: (Active, passive)
- Narration
- Clause (Main, subordinate, coordinate)
- Sentences (simple, compound, complex)
- Transitional devices/ connectives
- Cohesion and coherence
- Punctuation
- Articles
- Preposition

Section II: Writing

- Narrowing the problem
- Selection of topic
- Brainstorming and outlining
- Synthesis of source material
- Organization and Clarity of thought and ideas
- Vocabulary
- Spelling, paraphrasing, summarizing

- Similarities and differences
- Cause and effect
- Paragraph writing
- Sentence structures
- Problem solving

Section III: Editing and Drafting a research dissertation

- Organization
- Sections of a science paper; Abstracts, Acknowledgments, Introductions, Methods, Data Commentaries, Results Discussion and Conclusions.
- summary and paraphrase
- MLA and APA style
- Citation

Suggested Books for this Course

Wayne C. Booth, Gregory G. Colomb, Joseph M. Williams, Joseph Bizup and William T. FitzGerald's The Craft of Research, 4th Ed. University of Chicago Press.

Hacker, Diana and Sommers, Nancy. A Writer's Reference with 2016 MLA Update, 8th Edition. Bedford/St. Martin's, 2016. Print. ISBN-10: 1- 319-08353-6; ISBN-13: 978-1-319-08353-

Science Research Writing for Non-Native speakers of English. Hilary Glasman-Deal. 2010. Imperial College Press.

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