

# The Impact of Self-assessment of Engineering Students' Awareness of Pre-Writing Strategies on Writing Performance

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## Abstract

Success in academic writing is achieved when students adhere to a process approach to writing. In the Indian context, a typical classroom of engineering students is heterogeneous in nature. Majority of engineering students has disadvantaged backgrounds coming from rural and semi-urban places from across India. For such students, mastery over English language skills, particularly writing in English in the academic context, is still a major issue. The researchers of this study hypothesize that students' self-assessment of writing skills positively contributes to their own writing performance. The main aim of this study is to investigate the effects of self-assessment on the reflective skills of entry level undergraduate learners in writing. To achieve this goal, a self-assessment questionnaire was administered and informal interviews were conducted to 439 first year undergraduate students at IIT Bhubaneswar, India. The questionnaire assessed the awareness of learners towards idea generation and idea organization strategies in writing. The quantitative analysis and interpretation of the data showed that there is significant correlation between students' awareness of strategies and their performance on the written tasks. The results of the Independent-samples t-test showed that there is no statistically significant difference between male and female students with regard to their awareness of writing strategies. Finally, implications of the study, including the need for improving personal writing activities and academic writing, are discussed and recommended.

**Keywords:** awareness, engineering students, pre-writing strategies, self-assessment

## INTRODUCTION

Academic success of learners depends on how well learners acquire and perform language in terms of all language skills. However, in an academic context, writing as a skill plays an important role for learners use writing to function in formal contexts and make a headway into their specialized fields at university level (Hyland, 2004). It is also considered as an important skill of communication in this globalized world.

At tertiary level the learners were assigned with various writing tasks such as lab reports, project papers, research articles etc. These assignments were purposefully used as measuring tools for testing the learner's comprehensiveness towards learning materials presented at courses. Therefore, the mastery of writing skills is of prime importance for all the learners especially for those whose mother tongue is not English (Chou, 2011; Al-Hammadi & Sidek, 2014; Ajmal & Kumar, 2020).

#### *The Association between Learning and Assessment*

The main purpose of education is to extend the learning capacity of an individual learner and help him/her to make a positive impact both at personal level and at societal level. In order to realize this goal, the educational institutions should provide a conducive environment for all the learners by actively involving them in various situations or tasks which demand the construction of a new knowledge (Boud, 1995; Jones, & Shelton, 2006). Along with this, the learners should also be introduced to the concept of self-assessment and peer-assessment for developing their metacognitive awareness (Ebrahimi et al., 2021).

#### *What is Self-assessment?*

Self-assessment can be defined as a meaningful practice by which learners 1) revisit their own thinking process (Zohar, 2004) 2) judge their own behavioural patterns (Kutlu, 2018) and 3) identify the areas that require more understanding and need strategic awareness (Oscarson, 1997). It means, self-assessment occurs when students evaluate or critique their own work for identifying discrepancies between the current and desired performance. Many research studies have strongly supported the positive influence of self-assessment on student's learning process. (Sluijsmans et al., 1998; Asadoorian and Batty, 2005; Liang et al., 2013; Plakans Lia, 2018; Liu and Brantmeier, 2019) strongly claimed that it promotes self-autonomy among the learners by making them aware of their own learning gaps and set goals accordingly. It also encourages learners to use a variety of learning strategies and enhances their motivation levels (Chamot and O' Malley, 1994; Birjandi, 2011). The self-assessment report of learners can also help the teachers to a greater extent by being aware of their learners' needs and design materials for better learning instruction (Blanche, 1988; Boud & Falchikov, 2007; Oscarson & Apelgren, 2011). From the above studies, it can be concluded that self-assessment can help the learners in knowing their cognitive aspects and bettering their metacognitive awareness.

#### **Significance of the study**

In traditional method of teaching, transmitting of information is given utmost importance where teaching of writing is seen as the final product. In the process, teachers seem to pay attention to correcting the grammatical errors of students than providing any constructive feedback for further improvement in writing. Hence, this creates a gap as students are not aware of the higher elements of writing. There is a huge gap between the current knowledge of the students and their actual performance on the writing tasks. The ESL students seem to merely imitate the written models and adhere to the simple instructions of their teachers. In this context, we can agree with Raimes (1983) as he rightly points out that content and self-expression are given least priority ESL writing

classes. The only form of assessment is teacher's correction of the first /final draft produced by the students by imitation of the original model.

Assessment forms were influenced by the change in teaching approaches and learners' needs (Saliha Chelli, 2013; Ebrahimi et al., 2021; Yan & Carless, 2022). Growing influence of writing in higher education and student's ability to self-reflect their own writing process are the latest developments in teaching writing. The failure of traditional forms of assessment gave rise to new forms of assessments such as self-assessment, peer assessment, portfolio assessment, protocol analysis, conferences, learning logs, journal entries etc., emphasized the concepts of learner autonomy learner autonomy and metacognitive awareness.

The effectiveness of self-assessment practices of writing itself needs to be investigated as the competency-based approach in higher education for developing effective writing skills. Therefore, this research is intended to investigate the effects of self-assessment on engineering students' level of awareness towards writing strategies. To realize this objective, a questionnaire was administered to the entry level students of the engineering undergraduate programme.

#### *Need for study / Motivation*

In the ESL learning context, teaching engineering learners academic writing is beneficial. Besides other language skills, writing helps these learners in expressing their opinions and ideas, both in formal and informal contexts of learning. However, it seems that engineering learners at premiere institutions like IITs, having come from various socio-economic and educational backgrounds, lack good understanding and exposure to writing as a skill. To be specific, these learners seem to be unaware of the basic aspects of writing such as grammar, vocabulary, sentence structure, punctuation; and the process of writing – pre-writing, actual writing and post writing. Such lack of knowledge has a negative impact on their overall academic performance. In the present context of the study, there is a need for understanding these engineering students the importance of self-assessment of writing skills as a crucial aspect of teaching writing. Self-assessment of writing leads to planning, designing, and strategy implementation of writing process. Most importantly awareness of pre-writing strategies helps students to improve their overall writing skills. Therefore, the researchers assumes that teaching the basic aspects of writing would enhance learners' expression through writing.

## **LITERATURE REVIEW**

### *Defining Writing*

Of all the language skills, writing is the complex skill which is a cognitive activity. To achieve success in writing, students in academic context require higher order language skills such as thinking, brainstorming, prior knowledge, planning, and the knowledge of language aspects, structure, audience and purpose of writing itself. According to Nunan (1989) "writing is an extremely complex, cognitive skill for everyone because, in this activity, the writer has to show control of some variables simultaneously." In the words of Bjork & Raisanen (1997) "writing is a tool for language development, for critical

thinking, and for learning in all disciplines.” Writing is a highly sophisticated activity which includes the “active control over cognitive processes engaged in learning” (Hattie, 2010).

#### *Awareness towards Writing Strategies*

Writing strategies influence the learners’ writing where it is used during writing process (Maharani, 2018). In a research study, Brookes & Marshall (2004) found that students found writing task very difficult as they attempted the tasks without any knowledge of writing strategies. According to Thorne (1993) knowledge of writing strategies is essential for all learners as it immensely helps students in their writing classes. In the process approach to writing, writing strategies facilitates students to construct their personal writing by setting goals, brainstorming or generating new ideas, organizing ideas and adhering to appropriate structure. (Lin et al., 2007). From the above studies, it can be concluded that awareness of writing strategies is a pre-requisite in the process of writing.

#### *Pre-writing*

Pre-writing is the first essential phase of the writing process (Bax, 2000). It is the stage of free writing where students have an opportunity to develop the given topic by relating the topic to their prior knowledge and by drawing on certain new knowledge which they eventually be able to discover in their writing process (Akhmedovna, 2020). In Hayes’ (2004) opinion, “pre-writing assists writers in laying out goals, generating ideas, organizing information, and building up the texts”. The study of Mogahed (2013) divided pre-writing stage into two components: 1) invention which focuses on generating more ideas by brainstorming, free writing, and listing and 2) arrangement which focuses on identifying and organizing ideas are two key components of pre-writing stage. It can be said that without knowledge of these two components students will not have any idea how to develop writing process.

#### *Role of Pre-writing Stage in the Writing Process*

Lily (2012) mentioned a number of benefits of pre-writing stage. In her opinion, knowledge of pre-writing strategies motivates students’ interests to write better and also improves their thinking abilities. Additionally, students become aware of structure of writing in terms of creating content and organizing ideas in a coherent manner. In his study, Bitchener (2009) is right in stating that ‘pre-writing is playing with ideas’ as it encourages students to freely generate ideas. Similar opinion about the pre-writing stage is expressed by Seow (2002) that pre-writing encourages students to write and stimulates their original thoughts in the process of writing on a particular topic. Rostampour (2015) states that “pre-writing engages energizing student participation in thinking, talking, group interaction, and skeletal writing activities that become parts of writing task.” Another important use of having the knowledge of pre-writing stage is that it helps student to delve into the topic, acts as self-assessment of their own understanding by reasoning what they think and the ideas they produce in writing exercise (Duckart, 2006).

### *Need for Self-assessment in Writing*

From time to time, students should do the self-assessment of their competencies in writing skills. Brown and Harris (2018) defined self-assessment in the K-16 context as a “descriptive and evaluative act carried out by the student concerning his or her own work and academic abilities” (p. 368). Panadero et al. (2016a) defined it as a “wide variety of mechanisms and techniques through which students describe (i.e., assess) and possibly assign merit or worth to (i.e., evaluate) the qualities of their own learning processes and products” (p. 804). Self-assessment motivates learners to learn better and also helps them identify their strengths and improve their weaknesses in the process learning. Self-assessment can be used to gather feedback which promotes and improves students' learning performance (Andrade, 2019). Research in higher education context shows that university students understand the importance and the function of self-assessment (Ratminingsih et al., 2018) and aware that self-regulation helps them to set goals, plan, self-monitor (Lopez & Kossack, 2007; Bourke, 2014; Ndoye, 2017) and reflect on what they are learning (Wang, 2017), and also contributes to overall academic achievement (Zimmerman and Schunk, 2011; Ladenika, 2020). All of the studies reviewed here support the view that self-assessment is a reflection tool which benefits learners to – do performance analysis; be critical about their own thinking processes (Van Helvoort, 2012; Siow, 2015); increase metacognitive awareness; and learn metacognitive strategies (Siegesmund, 2017).

### **AIM AND OBJECTIVES**

The main aim of the study was to understand engineering students' awareness of pre-writing strategies. And the objectives of the study were –

- to improve students' writing skills from their own self-assessment of writing and pre-writing skills,
- to identify students' pre-writing strategies which they employ in their writing performance,
- to understand students' awareness of idea generation strategies in pre-writing stage, and
- to know students' awareness of idea organization strategies in pre-writing stage.

### **RESEARCH QUESTIONS**

The research questions which guided the study are as follows:

1. To what extent ESL learners are aware of idea generation strategies in pre-writing?
2. To what extent ESL learners are aware of idea organization strategies in pre-writing?

## METHODOLOGY

### Participants

439 students studying engineering participated in the study. These students belong to various socio-economic and education backgrounds. The age group of the students ranges between 18 – 20 years. These students' English language proficiency can range from intermediate to advanced levels.

### Tools

A self-assessment questionnaire was designed to understand students' awareness of pre-writing strategies. The questionnaire includes questions on pre-writing strategies such as brainstorming, planning, and organizing of ideas. Informal interviews were held with students on deliberating the importance and usefulness of self-assessment in improving overall writing skills.

## DATA ANALYSIS AND INTERPRETATION

The data was analyzed both qualitatively through describing, and by quantitatively through statistics by using the SPSS software.

### *Awareness of Pre-writing Strategies*

The respondents were asked rate their agreement with some statements to evaluate their awareness of the writing strategies. They are provided with a nine item five-point Likert scale. The scale is coded from one which is strongly disagree to five which is strongly agree. The higher the score is the more students agree with the given statements.

**Table 1.** Descriptive Statistics of the Awareness of the Pre-writing Strategies

	N	Sum	Mean	Std. Deviation
1). I think about the topic before I start writing.	438	1880	4.29	1.143
2). I discuss about the topic with my peers.	438	1160	2.65	1.132
3). I frame some questions in my mind about the topic.	438	1427	3.26	1.177
4). I write all the possible terms that are related to the topic.	438	1406	3.21	1.222
5). I freely write all the ideas on the paper without concerning for corrections.	436	1353	3.10	1.269
6). I try to put all the scattered ideas into an order.	438	1584	3.62	1.223
7). I group the ideas that seem to go together.	438	1617	3.69	1.245
8). I categorize the ideas into sub lists.	438	1389	3.17	1.255
9). I plan the essay before attempting it.	438	1588	3.63	1.282

The statements can be ranked from the largest to the smallest. They are classified as follows:

- 1). I think about the topic before I start writing ( $M= 4.29, SD= 1.143$ );
- 2). I group the ideas that seem to go together ( $M= 3.69, SD= 1.245$ );
- 3). I plan the essay before attempting it ( $M= 3.63, SD= 1.282$ );
- 4). I try to put all the scattered ideas into an order ( $M=3.62, SD= 1.223$ );
- 5). I frame some questions in my mind about the topic ( $M= 3.26, SD= 1.177$ );
- 6). I write all the possible terms that are related to the topic ( $M= 3.21, SD= 1.222$ );
- 7). I categorize the ideas into sub lists ( $M= 3.17, SD= 1.255$ );
- 8). I freely write all the ideas on the paper without concerning for corrections ( $M= 3.1, SD=1.269$ );
- 9). I discuss about the topic with my peers ( $M= 2.65, SD= 1.132$ ).

The analysis in table 1 above shows that students are aware of the idea generation and idea organization strategies in the pre-writing stage.

Since the sample size comprises more than two hundred respondents, the data can be analyzed using Principal Component Analysis.

**Table 2.** Rotated Component Matrix<sup>a</sup>

Items	Components		
	F1	F2	F3
Q1	.676		
Q2	.632		
Q3	.578		.207
Q4	.533	.357	
Q5	.524	.134	
Q6		.628	
Q7	.345	.557	.408
Q8	.394		
Q9	.266		.513
Cronbach's alpha, $\alpha$	NA <sup>b</sup>	NA	NA
% of the explained variance	23.36	12.67	11.35
% of total variance explained		47.38	
Determinant		.539	
Precision measurement of Kaiser-Meyer-Olkin sampling (KMO)		.698	
Bartlett sphericity test:		266.171	
Chi-square approximate		36	
DF		.000	
Significance of Bartlett			

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

b. Not applicable

The analysis has revealed that there are three components within the scale. Items from one to five constitute one scale. They are about brainstorming ideas and writing them down. The second component comprises items six and seven which are about grouping ideas. The last component comprises just one item on planning the writing on a topic, which is a metacognitive skill.

**Table 3.** Independent Samples Test of Gender and Awareness

		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
Awareness of Pre-writing strategies	Equal variances assumed	1.452	.229	1.205	434	.229	-.07864	.06528	-.20694	.04965
	Equal variances not assumed			1.430	154.030	.155	-.07864	.05498	-.18726	.02997

The results of the Independent-samples t-test show that there is no statistically significant difference between male and female students with regard to their awareness of writing strategies. However, there is a difference in the mean score of the male group ( $M= 3.41$ ,  $SD= .26$ ) and the female group ( $M= 31.42$ ,  $SD= .54$ ). This difference characterizes just the sample and not the population.

## DISCUSSION

Understanding students' awareness of idea generation and idea organization skills in the pre-writing stage is a fundamental need in knowing students' desired writing composition as well as in devising a plan for imparting those skills to students. However, it seems that these students seem to perform writing tasks under the traditional approach where more emphasis is given for grammatical accuracy and lexical rather than the content and self-expression of ideas. It is a given understanding that students consider writing as merely a transmission of literal thinking spontaneous flow of ideas on to paper. Students also seem to simply imitate writing from what they have already memorized which hinders students thinking or brainstorming for ideas on the given topic. These are some of the reasons we can say that why students' do not make efforts to excel in pre-writing stage which ultimately leads to overall poor performance in academic writing.

The present study aimed at understanding the impact of self-assessment of engineering students' awareness of pre-writing strategies on their own writing. Hence, students were facilitated to self-assess their own awareness about pre-writing strategies by answering

to the self-assessment questionnaire. The results indicate that students' awareness of pre-writing strategies positively correlate with their better academic writing performance. On the other hand results also indicate that lack of awareness of pre-writing strategies hinder students' academic writing. The knowledge of pre-writing strategies stimulate students' thinking and also enhance their understanding of the structure of writing composition.

In addressing the first research question, with regards to the idea generation strategies, from the findings in table 1, we can see that high majority of the students have indicated that they think about the topic before they start writing ( $M= 4.29$ ). It emphasizes on the fact that students do think about the topic before writing. However, students seem to be less aware of the other idea generation skills such as – framing questions in mind about the topic ( $M= 3.26$ ); writing possible terms related to the topic ( $M= 3.21$ ); freely writing ideas on paper without concerning for corrections ( $M= 3.1$ ); and discussing the topic with peers ( $M= 2.65$ ).

With regards to idea organization strategies are concerned, the findings of the second research question shows majority of students have mentioned that they group the ideas that seem to go together ( $M= 3.69$ ); plan the essay before attempting it ( $M= 3.63$ ); put all the scattered ideas into an order ( $M=3.62$ ). From these results we can infer that most of the students seem to be fairly aware of the idea organization strategies in the pre-writing stage. However, it shows that majority of the students do not seem to be familiar with the categorizing the ideas into sub lists ( $M= 3.17$ ).

The findings of the study shows that language learning and assessment are closely associated in practice. An important observation is that students seem to take the self-assessment positively for they hardly do this exercise. Some students expressed, 'reflection acts a learning tool.' One of the students is of the opinion that self-reflection should be done from time to time to excel in overall learning.' A group of students mentioned that self-reflection fosters critical thinking which aids in improving writing skill. Overall, it was observed that students have never made any reference to the fact that self-assessment is connected with cognitive and metacognitive strategies.

## **IMPLICATIONS**

The study offers the following implications for both teachers and students.

- 1). Adequate vocabulary, i.e., breadth and depth of knowledge, positively affects students' idea generation skills.
- 2). Students should acquire vocabulary as it enhances their writing.
- 3). Students' early habits of reading and study skills impact their performance in writing skills. Hence, teachers should are for inculcating these study habits of students very early on at the primary and secondary school levels.
- 4). Teachers may be aware of all the elements of writing so that they can help their students in the pre-writing stage.

- 5). Teachers may conduct some remedial classes for weak students to teach them the finer aspects of writing process.
- 6). Students and teachers at college level may attend some workshops or training in improving their academic writing skills.
- 7). Students and teachers may improve their writing skills through regular reading and writing practice.

### **PERSONAL WRITING ACTIVITIES**

Effective written communication is the need of the hour in any academic context. Hence, teachers can devise certain action plan for student writing activities which are relevant, integrated and engaging in nature. There is need for helping students to cultivate love for writing because students have fear of formal and academic writing. Some of the writing activities are mentioned below.

- Real-world writing: It is beneficial for students if teachers could make writing activity relevant by connecting it to the real and day-to-day situations. For example: emails, letters, resumes, reports, poster writing, essay writing, etc.
- Reading based writing: Students should be helped with and inculcated with reading habits which lead to better writing performance. Teachers should help students understand that reading and writing are closely connected. Teachers may advise students to read books, newspapers, magazines, posters, story books, reading cards, etc.
- Vocabulary centered writing: Students should be helped to develop appreciation and liking for words which builds connections to both reading and writing. Teachers may provide theme based word cards, puzzles, story books, topic or subject specific words, word lists, etc.
- Personal writing: Writing can be based on daily personal experiences and interests. Students should practice writing daily for developing their writing skills. For example: describing places, events, and people; writing about wishes, plans, and creative ideas, etc.

### **SCOPE FOR FUTURE RESEARCH**

The study makes the following recommendations for teachers, and researchers for further research in the area:

- 1). Carry out a comprehensive needs analysis of ESL learners' awareness and understanding of academic writing composition.
- 2). Adopt cognitive and metacognitive strategies and teach ESL learners to improve their writing skills.
- 3). Design, implement and evaluate ESL remedial programmes for improving students' academic writing composition.

4). Test if the students' poor reading and listening habits correlate with their lack of writing skills.

## CONCLUSION

As a conclusion, the study is aimed at comprehensive understanding of the engineering ESL students' idea generation skills and idea organizations skills in the pre-writing stage. Keeping the students' socio-cultural and education backgrounds, the study assumed that these students seem to lack the idea generation and idea organization skills while performing academic writing. A student questionnaire on pre-writing skills was administered and informal interviews conducted to all students and the data was analysed both qualitatively and quantitatively. Within the scope of academic writing composition, with regards to idea generation skills, this study suggests that students should practice thinking, discussing, framing, outlining, and free writing before actually writing on the topic. Next, the students should draw lines between the idea generation skills and the idea organization skills to organize the sentences clearly and coherently by putting the ideas in an order, grouping and categorizing the ideas, and the overall plan or structure of the essay or composition. Self-assessment of writing skills for students is necessary from time to time. Finally, the study recommends that there is an immediate need for teaching the idea generation skills and idea organization skills to engineering students to enhance their academic writing composition.

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