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## LEARNER COLLABORATION AND TEACHER SCAFFOLDING WRITING ACTIVITIES: PERCEPTION OF SCIENCE AND TECHNOLOGY-BASED UNIVERSITY STUDENTS

By

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### ABSTRACT

*The study explored the perception of university students in science and technology related disciplines regarding collaborative language learning and teacher scaffolding in English for Academic Purposes (EAP) writing classes. After having been exposed to the formal cooperative learning activities and scaffolds for one semester, experimental subjects responded to a researcher-designed questionnaire. Results showed positive attitude among students to the two writing approaches. In the light of the findings, it is recommended that university students, especially in the English for science and Technology(EST) written English classes, require an adequate time to learn from one another in manageable group sizes. The teacher's role, in this situation, is that of an enabler and a facilitator who offers input as the need arises.*

**KEYWORDS:** perception of students, science and technology-based, learner collaboration, scaffolding, EAP writing classes, university students, EST

### INTRODUCTION

With large class size in most Use-of-English classes in Nigerian tertiary institutions, catering for individual differences during writing tasks is always difficult (Nzewi, 1998; Aborishade, 2003). The writing activities proposed in this study suggest an autonomous language learning that requires correction strategies through conferencing both among peers and with the teacher. Several studies have indicated the relevance of Collaborative learning, on the one hand, (Coelho, 1992; Olsen, & Kagan, 1992; Johnson, Johnson, & Holubec, 1994; Dudley-Evans & St John, 1998) and Scaffolding, on the

other, (Wood, Bruner, & Ross, 1976; Duncan, 1996; Rollinson, 2005; Mcleod, 2010). The present study was, however, set to examine the efficacy of combining the two techniques. Although the impact of collaborative language learning, especially in the EAP class, cannot be over-emphasised, it is essential to ascertain the vital roles the teacher performs. Combining these two techniques make the teachers' roles in the teaching and assessment of writing easier. This way, active class participation among students is greatly enhanced.

Also known as cooperative learning, collaborative learning is a learner-centered approach to

the teaching – learning process This approach nowadays takes the place of the traditional teacher – fronted method. Although a group –based, this technique is meant to foster learning through cooperation rather than competition. Since most EAP classes are based on mixed abilities, students can be grouped along that line, such that weaker students will get further assistance from the brighter ones. As reported by Johnson et al (1994), the duration of a learning group largely depends on the task coverage and teachers' intention. Thus, a group could be formal, informal, ad hoc or long term. Subjects for the present study were grouped primarily for the purpose of improving their written English performance in the second semester where the course: Use-of-English II exposes students to the skills of research paper writing, functional writing and group-based term paper writing. According to Olsen & Kagan (1992), the teacher is always expected to ensure, among other things, positive interdependence, a careful structuring and formation of groups and individual accountability at the end of the whole exercise. Apart from enhancing writing competence, the composing process, which involves collaboration among peers, promotes the spirit of cooperation (Shehadeh, 2005). It is always true that many learners seem to like working with each other. This way, students could be allowed to interact by commenting on each other's brainstorming, free-writing and organisation. This interactive opportunity helps to gather more ideas (Tomlinson, 1983). In this regard, Widdows & Voller (1991) lend support to this strategy when they report that students do not like classes in which they sit passively or even work on individual basis.

Separate studies by Xiang (2004), Shin (2007) and Walker & Riu (2008) also revealed that monitoring by teachers and giving students controls over their

feedback tend to enhance their writing process. In addition to learner collaboration that promotes cooperation among students, composing and polishing processes of readable documents require teacher scaffold. As a teacher intervention, scaffolding provides insights and critical thinking. No wonder, Duncan (1996) sees the activity as a problem solving approach.

It is normal that novice writers require feedback. This is a process for improvement as Hedge (1991) points out. The feedback, in this sense, is in two ways: from peers and from the teacher. Campbell (1990), Ferris (2002) and Rollinson (2005), for this reason, advocate for conferencing in pairs, then in small groups and later with the teacher. This idea discredits the traditional error correction practice. In defiance of the error – search ideas, White & Arndt (1991) suggest the following inter related stages. They involve first, generating ideas, then "focusing/thematisation" (to decide whether to introduce a sentence either with its subject or with a modifier depending on where prominence is attached) as the process progresses to include "fast writing/free writing" , a stage next to brainstorming when ideas generated initially are developed freely and quickly as they come to mind during the writing process and "loop writing", the task of making writer's own summary for each paragraph through the deductive pattern of specifying the thesis/focus of each broad idea, at the same time considering the purpose, audience and forms. Next is re-structuring, which involves correct word order and sentence repositioning through logical ideas manipulation by way of proper grouping and sequencing.

There is also the drafting stage. The first draft is always considered as writer-based, while the second draft is reader-based. This is the beginning of the

writing- proper as all the preceding steps are at the pre-writing level. Producing the first draft is usually in the class where students are in groups. Here, each group will participate in offering suggestions regarding improvements of the draft. The other stage is that of evaluating not only the first but also the subsequent drafts after having been earlier edited. At the evaluating stage, students are actively engaged in responding to each other's writing. This is through peer conferencing which is followed by teacher – student conference or scaffold. In this regard, the teacher – student discussion on an individual basis may not be practicable in our large class situations. Nevertheless, an informal teacher-student conferencing may be opted for. This is where the teacher goes round as students write. In this case, the teacher spends one or two minutes with each group, thereby providing scaffolds for them to continue with their work.

The place of in-class scaffolding by the teacher cannot be far-fetched. According to Wood et al (1976), scaffolding refers to 'those elements of the task that are initially beyond the learner's capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence' (p. 9). Corroborating this definition, Rose, Lui-Chivizie, McKnight & Smith (2003), assert that, 'scaffolding refers to the support that a teacher can give learners so that they can work at a much higher level than is possible on their own' (p.42). The idea implies that, through the practice, those who were initially reluctant could actually be made to participate in the writing activity, thereby beginning to develop both confidence and competence in the exercise. Whenever an initial in-class discussion takes place prior to the writing activity and then followed by group work and teacher's follow-up, students' performance would greatly improve. Where scaffold is accompanied by

video tapes and cues, the learners' critical thinking in the process tends to also develop. However, video tapes were not involved for the present study as there were several other available scaffolding techniques utilised. Duncan (1996) points out that, scaffolds include devices that support students' learning. Scaffolds in writing, according to him, are reflected following an acronym developed to represent problem-solving approach relevant to writing. That is POWER: P-planning, O-organizing, W-writing (the preliminary draft), E- editing, and R-revision. This point further stresses the link between scaffolding and polishing of drafts.

## PURPOSE OF THE STUDY

The main purpose of the study was to investigate the perception of students regarding collaborative language learning and teacher scaffolding in EST/EAP writing classes.

## RESEARCH QUESTION

Research question raised for the present study is:

- I. What is the university science and technology-based EAP students' perception of collaborative learning and teacher scaffold in the writing class?

## THEORETICAL FRAMEWORK

This study is based on Vygotsky's (1978) Zone of Proximal Development (ZPD) theory. It is a Social Learning Model, in which case the teacher is a support in the teaching-learning process. As Vygotsky (1978) defined the concept, ZPD refers to 'the distance between

the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers' (p.86). The learners are required to share ideas in a cooperative non-threatening manner. Relating this idea with writing techniques, the activities involved are, therefore, associated with socio-cultural approach to interaction. The concept of scaffolding sees learning process as a joint activity constructed by the learners collectively (Shehadeh, 2005). The teacher's role, in this case, is that of a support in the entire learning process. The whole exercise here is learner-based with the teacher as a facilitator (Duncan, 1996; Rose et al, 2003). The teacher scaffolding, along with learner collaboration, goes a long way in checking the punctuation, lexical structures and grammatical conventions. The activity is also capable of addressing the higher level categories, such as coherence, consistent structuring, complete thought, as well as the social context (Swales, 1990).

## RESEARCH METHODOLOGY

Population for the study comprised Eight Hundred and Forty Seven EAP/EST fresh students in the

basic science written English class at Abubakar Tafawa Balewa University, Bauchi-Nigeria at the end of the Second Semester of 2012/2013 session. Sixty students were selected by a simple random sampling.

Quantitative data was obtained through 15 questionnaire items for experimental subjects based on the Likert scale. Using inputs from Rees, Sheard, & McPherson (2002), responses were organised using a four-interval rating scale: Strongly Disagree (SA) = 1, Disagree (A) = 2, Agree (D) = 3 and Strongly Agree (SD) = 4.

The content validity of the instrument was established by having the items evaluated by specialists in both research in education and second language teaching. Respondents chose from the scales 1 to 4 by ticking the appropriate box which corresponded to each item. Positive attitude sub scale was determined by adding the scores of items A, D, E, F, H, K and P. The negative attitude was obtained from the scores of items B, C, G, I, J, L, M, N and Q.

## RESULTS

The findings, as shown in figures (and percentages), are presented below:

**Table 1:** Description of attitudes brought out by students

S/N	ITEMS	1 Strongly (SD)	Disagree	2 Disagree (D)	3 Agree (A)	4 Strongly (SA)	Agree
A	Science students require this training.	01 (1.7%)		04 (6.7%)	21 (35%)	34 (56.6%)	
B	I need writing strategies to excel.	42 (70%)		11 (8.4%)	05 (8.3%)	02 (3.3%)	
C	The training was not necessary.	49 (31.6%)		07 (11.7%)	03 (5%)	01 (1.7%)	
D	The strategies have improved my performance.	03 (5%)		07 (11.7%)	19 (31.7%)	31 (51.6%)	

Percentages are in brackets

Out of the 60 participants, 55 (91.6%) agreed that writing performance was generally an essential quality of every science/technology-based university student, with 5 members (8.3%) disagreeing with the statement. 53 (88.3%) disagreed that they did not require such training in writing strategies to obtain a degree, meaning that they really needed the training and 7 (11.7%) agreed with the statement. 56 (93.4%)

were of the opinion that they are not contented with the writing skills they had already acquired before entering the university implying that they needed additional skills in writing while the remaining 4 (6.6%) felt that they already have adequate writing skills. 50 (83.3%) members indicated that the training has generally gone a long way in improving their writing performance while the others 10 (16.7%) would not agree.

**Table 2:** Benefits from the training

S/N	ITEMS	1 Strongly (SD)	Disagree	2 Disagree (D)	3 Agree (A)	4 Strongly (SA)	Agree
E	The training gave me fresh ideas.	04 (6.7%)		05 (8.3%)	13 (21.7%)	38 (63.3%)	
F	I received further insights from peers.	03 (5%)		07 (11.7%)	20 (33.3%)	30 (50%)	
G	These activities were tedious.	27 (45%)		15 (25%)	08 (13.3%)	10 (16.7%)	
H	The activities have fostered team spirits.	02 (3.3%)		05 (8.3%)	19 (31.7%)	34 (56.6%)	

I	My group members did not participate.	22 (36%)	19 (31.7%)	12 (20%)	07 (11.7%)
J	I cannot accept input from colleagues.	24 (40%)	20 (33.3%)	09 (15%)	07 (11.7%)

Percentages are in brackets

Interestingly, another large proportion of well over 50 (85%) also submitted that the training provided them with further insights such as idea structuring and sentence combining, which they got from the teacher regarding writing strategies. However, the remaining nine (15%) did not agree. With regards to obtaining ideas in the training from peers, 50 (83.3%) members accepted the fact that their colleagues also benefitted them tremendously and still 10 (16.7%) ceased to agree. And, 18 (30%) of the respondents were of the opinion that the training was tedious, suggesting that it should not be encouraged henceforth. Samples of student collaboration clearly show that a category of participants, who demonstrated zeal through active participatory roles, later became passive. The tendency could be attributable to the long duration of six weeks for the training while their colleagues in the control

group were not involved. The other 42 (60%), however, insisted that it was not tedious as such. 53 (88.3%) opined that the activities have fostered team spirit, implying that the training has encouraged cooperation among peers at the expense of the remaining seven members (11.7) who disagreed.

From Table 2, it is also clear that least number of respondents (19, representing 31.7%) pointed out that students did not actively participate in the activities. Obviously, some students are introverts by their nature and others wanted to dominate the sessions. These instincts are normal among learners, anyway. Similarly, only 16 (26.7%) claimed that they would not accept input regarding writing strategies from mere colleagues. Introvert tendencies are not to be noted to imply lack of interest or low level of understanding. After all, a larger proportion of the students actually did participate.

**Table 3:** Overall assessment of the training session

S/N	ITEMS	1 Strongly Disagree (SD)	2 Disagree (D)	3 Agree (A)	4 Strongly Agree (SA)
K	This training should be encouraged.	03 (5%)	05 (8.3%)	22 (36.7%)	30 (50%)
L	I need only grammar and oral fluencies.	24 (40%)	27 (45%)	7 (11.7%)	2 (3.3%)
M	These activities were unrealistic.	17 (28.3%)	23 (38.3%)	10 (16.7%)	10 (16.7%)

N	The training activities were a fun.	27 (45%)	24 (40%)	4 (6.7%)	5 (8.3%)
O	Improvements were attributable to personal efforts only.	20 (33.3%)	22 (36.6%)	13 (26.7%)	05 (8.3%)
P	Collective efforts led to our progress.	04 (6.7%)	04 (6.7%)	27 (45%)	25 (41.6%)

Percentages are in brackets

Furthermore, 52 (86.7%) agreed that such training activities should be encouraged while only 09 (15%) remarked that the whole exercise was a fun and 52 (81.7%) attributed the improvement in their writing performance to both individual and collective effort/peer collaboration.

A high number of respondents (51 representing 85% also disagreed that mastery of grammar and oral fluency were adequate enough to enhance their writing performance and same number

also disagreed that the exercise did not in any way reflect a real life situation. 42 (70%) also disagreed that their improvements were entirely based on personal effort. These further suggest that the training, which was far beyond grammatical correctness and oral fluency, played an immense role in enhancing the subjects' writing ability. This is evident in the two tables indicating strategies students have acquired owing to teacher scaffolding profiles at both composing and revision stages of the writing process.

**Table 4(a):** Teacher Scaffolding Profile at Composing Stage

Composing strategies	Teacher Scaffolding Activities
brainstorm	Lead students either to cluster, map, spray chart or a list and gather ideas bearing in mind the main topic, purpose and expected readers.
sentence combining	Explain how separate clauses are combined using linking devices to form complex expressions
text completion	Expose students to the strategies of selecting appropriate words/phrases to fill-in missing gaps in order to arrive at a complete and meaningful body of idea.
un jumbling	As a specialist adviser, guide students to rearrange, in sequential order, separate sentences so as to construct a coherent idea/paragraph
fast writing	Make students to build the first drafts freely emanating from (though not strictly on) the brainstorm such that more ideas could be inserted as they emerge at any stage of composing
thesis identification and	As a problem raiser and problem solver, encourage students to pause, think, raise questions

development	and formulate to determine the main idea of any section and subsection.
idea sharing	Enhance the students' level of interaction so that they learn to cooperate with one another in their respective group activities that involve exchange of ideas
self monitoring	Stimulate them to revisit their drafts by going forth and back for effecting self assessment in the composing process.

**Table 4(b):** Teacher Scaffolding Profile across Revision Strategies

Polishing	Teacher Scaffolding Activities
self editing/assessment	Introduce the strategies of observing, remembering and viewing additional ideas as well as the appropriate places to insert them
idea formulation	Encourage them to reflect on what was already produced and then consider its relationship with what follows
discourse organization	While avoiding giving complicated instructions, introduce the concept of intra and inter paragraph cohesive ties
Crafting	Guide, without unnecessarily over-helping them, to develop the overall text structure through building words to form sentences sequentially
group editing	Instill in them the spirit of teamwork in order to offer one another constructive ideas on the sequence of the text. This way, they are made to share ideas as they engage in responding to each other's work
evaluation	Lead them to check for mechanical errors and work with students to regroup ideas according to relevant sections and paragraphs
time allocation	Even though the entire process is unpressured, guide students to be good time managers in the drafting, redrafting and revising activities

## DISCUSSION

The present study investigated students' perception of collaborative/cooperative learning and teacher scaffold. The data in Tables 1, 2 and 3 have shown the ratings of students' responses regarding

their attitude to the training in writing techniques they had acquired at the treatment stage. Those techniques involved brainstorming, thesis development and logical sequencing through reordering jumbled-up passages



and sentence completion. The subjects' responses to statements reflected their negative and positive attitudes. On the whole, it can be inferred that, the positive attitudes, as revealed in the subjects' responses, outweighed their negative attitudes.

Finding from this study is in harmony with several others on cooperative language learning and scaffolding activities by teachers (Coelho, 1992; Duncan, 1996, for instance). However, unlike those cited, the present research is concerned with the simultaneous integration of offering scaffolds by the teacher in the course of the collaborative learning. Kaufman & Schunn's (2010) study found out students' negative perceptions about peer assessment. They, instead, indicated a preference to instructor assessment. This idea is responsible for the students' remarkable improvement in writing performance as shown in Tables 4 (a) and (b). Similarly, as opposed to previous investigations on similar subjects, this study is restricted to the writing among science and technology-based university students. As pointed out in several EST- related literatures, (Dudley-Evans & St John, 1998; Purto, 2001, for instance) attention towards the area is crucial in the writing of tertiary level students.

## CONCLUSION AND RECOMMENDATIONS

It is evidently clear, in the light of the result of the questionnaire above that, the positive attitude of the experimental subjects by far outweighs their negative attitude. This conclusion is actually based on the pattern of the questionnaire responses as obtained and administered. In the light of the result obtained, the following recommendations are provided.

- Other EAP teachers are advised to adopt the technique of integrating scaffolding into cooperative language learning. This is in the effort to improve writing and foster cooperation among peers.
- Teachers should accord fair treatment to groups when rendering the scaffold.
- As a facilitator and an enabler, the teacher ought to be careful and patient when attending to groups
- As suggested in Olsen & Kagan (1992), adequate care should be taken to ensure, among other things, that:
- Every group member is given the opportunity to contribute so that no single member dominates the session.
- There should be a positive interdependence in a way that every member is awarded the same score obtained by his/her group for each task.
- Assigning membership to groups is to be decided always by the teacher to cater for sex difference, course of study, age, ethnicity, etc.
- There should be individual accountability at the end to determine the impact of the activities.

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