Aligning Academic Writing Practices with Learners' Needs through Content-based Instruction

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Abstract: The last four decades have witnessed considerable scholarly efforts devoted to formulating instructional techniques that help to equip learners with academic language skills. As part of these effort, this study investigated the combined role of content-based instruction (CBI) and the socialization model of genre theory in aligning writing practice to the academic needs of Computer Engineering students drawn from a population of second-year university students. The study employed a quasi-experimental design and quantitative tools of data collection and analysis. The results of the study showed that this pedagogical approach is far better than the conventional approaches to target and develop writing skills relevant to the learning needs of students in their academic disciplines. Also, the operationalization of the investigation process has important pedagogical implications in (1) revealing the social foundation of acquiring discursive academic writing, and (2) the distributed role of actors in developing such skills.

Keywords: content-based instruction, aligning skills, genre, technical writing, project, memo, English for academic purposes

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Introduction

The last three decades witnessed a widely held consensus among educators of English as a second language (ESL) or English as a foreign language (EFL) that mastery of academic language skills is indispensable for the lives of students in the academic world and beyond (Cummins, 2000; Horowitz, 1986; Schleppegrell et al., 2004). As an extension of this assertion, writers endeavored to characterize this set of language skills with the view to formulate instructional models suiting their nature. Cummins (1999), in his characterization of this set of language skills, makes a distinction between basic interpersonal communicative skills (BICS) and cognitive academic language proficiency (CALP). Basic interpersonal language skills are those that learners use and develop in their everyday communication, including those in the home environment. According to Cummins (1999), this set of language skills develops relatively in a short period of time (2-3 years). In contrast, cognitive academic language proficiency takes longer to master (5-7 years). This is mainly because it develops through language practices made in an academic milieu in years of schooling, changing in levels of abstraction and density of thought as students mature in conceptualizing ideas in academic subjects. Further, as what takes place in school is the development of specialized knowledge, the language used to construe that knowledge takes on specialized features that make it different from the language we use in our everyday lives (Horowitz, 1986; Schleppegrell et al., 2004).

Several research reports (Cummins, 1981; Currie, 1993; Frazier, 2010) have demonstrated that this proficiency is indispensable for the academic success of learners at secondary and tertiary educational levels. Christie (1985), as cited in Abebe (2013), summed up the voice of these writers, saying that language is the *hidden curriculum* of academic life, and those who fail in schools are those who fail to master genres of academic communication.

As language educators in the ESL/EFL world are increasingly concerned with more realistically meeting the academic language needs of their students, they endeavored to formulate instructional approaches that address these needs. To this end, the teaching of English for academic purposes (EAP), as one of the variants of English for specific purposes (ESP) instruction, dominated the pedagogical scene in the past three decades. The practice of EAP instruction, in turn, involves a variety of instructional approaches. One such model, widely practiced in the 1980s and the 1990s, is the skills-based approach to EAP (Heath, 2001; Kasper, 1995).

The skills-based approach to the EAP instruction is premised on the assumption that *writing* and *literacy* are primarily individual and cognitive skills. The approach focuses on the surface features of language forms, rhetorical strategies, and vocabulary spheres. It presumes that once students master these sets of the target language in the EAP classes, they can transfer their knowledge of writing and literacy unproblematically from one context to another —in this case, from the foreign language classroom to the content area classroom. This model of instruction dominated writing instructional processes of EAP across EFL educational settings (Starfield, 2001), including that in Ethiopia (Hyland, 2004). Such practices are mainly characterized by the extensive use of simulated texts created by EFL/ESL teachers. These texts are designed to emphasize rhetorical patterns, vocabulary domains, and particular grammatical structures that are intended to be applied in classroom activities related to the subject matter. This approach is still prevalent in Ethiopian EAP instruction (Currie, 1998; Schelpgrell et al., 2004).

Recently, the skills-based approach to EAP instruction has attracted criticism from socio-constructivist language educators, giving birth to the socialization model of EAP instruction (Duff, 1995; Ochs, 1988; Paugh, 2000). This model of instructional approach is widely based on the assumption that individuals learn the language of the speech communities to which they are members, or are born into, and every

speech community has evolved ways of using language that are functional for that community's needs (Brinton, 2003; Crandall & Tucker, 1990). According to these writers, the discourse communities of academic disciplines, as social units, have their own ways of using language that are functional to the members of a discourse community. This way of language use is constituted by oral and written discourses, communication genres, registers, graphics, linguistic structures, and interactional patterns. These language forms are privileged, expected, cultivated, conventionalized, or ritualized, and, therefore, are usually evaluated by instructors, institution editors, and others in educational and professional contexts (Duff, 1996; Martin and Rose, 2007; Moore, 2008). Finally, these writers suggested the need for inquiring into instructional models that would enable teachers to align EFL/ESL writing practices to those writing tasks in academic disciplines, and, thereby, remedy the deficiencies of the conventional approach to EAP instruction. Yet, despite these suggestions, little research output has been reported to this effect (Gaffield-Vile, 1996; Kasper, 1995; Schelppegrell, 2004; Tsai, 2010).

To bridge the gap mentioned above, the author of this article experimented with content-based instruction (CBI) and the socialization model of apprenticeship as a pedagogical approach to the acquisition of specific academic genres among learners in Ethiopian EFL classes. The motivation for this study stemmed from the researcher's own classroom experiences and the unsatisfactory learning outcomes observed in the EAP course offered to Computer Engineering students. This particular course, known as technical writing, primarily aims to develop the cognitive academic language skills necessary for students to succeed in their Engineering studies. The course materials consist of tasks that require students to analyze and practice various rhetorical and organizational patterns commonly found in academic Computer Engineering discourse, such as procedure description, process analysis, and cause-and-effect relationships. Model essays are also provided in

the teaching materials to foster awareness and understanding of these patterns.

The subjects of these essays are descriptions of objects, processes, and natural phenomena drawn from the students' daily experiences. The assumption in the course has been that once students practice the skills of description, process writing, and cause-effect analysis based on their daily experiences, they will be able to use the same patterns appropriately in organizing their Engineering project works and exams across their courses at the Engineering college and in their professional practices later on. Yet students who were skill-trained through the use of such sets of input and practice processes lack the linguistic, rhetorical, and organizational skills instrumental to dealing with their academic tasks and exams. Their deficiency was further evident from the complaints of their academic content instructors and researchers (Asmare, 2010). Moreover, the researcher observed a considerably low motivation among the students to engage in the writing tasks of this course material.

Prompted by this evidence, the researcher tried to draw insights from the social constructivist approach to apply to the teaching of ESP courses outlined earlier. He drew lessons from a previous study (Abebe, 2013) conducted in an Ethiopian EFL setting. This study demonstrated the role of content and language integrated learning (CLIL) in raising academic genre awareness of EFL learners in legal studies. In the said research study, it was recommended that further exploration into the role of this educational model and the insights of the socio-constructivist model in EAP teaching in other disciplines be done. Thus, the author of this article embarked on inquiring into the impact of the content-based language instruction (CBLI) in the acquisition of the academic genres in Computer Engineering writing.

As a preliminary step in the present study, the researcher assessed the types of academic tasks actually required across the academic discipline of Computer Engineering and about instructors' purposes in assigning

these tasks. To this end, 20 exam papers and 15 assignments in four areas of Computer Engineering were surveyed and examined. The assessment of these documents showed that 85% of the project works and exams in the study required students to organize project outcomes into a short technical report, following a genre widely acclaimed by members of the discourse community of Computer Engineering. This genre, known as Project Memo (short technical report), is a text type in which students demonstrate what they have accomplished in a laboratory experiment, field work, feasibility studies, etc. Also, this genre is used at all levels of learning in Computer Engineering in EFL educational settings in testing students' (1) ability of translating theoretical knowledge into practical applications, and (2) knowledge of the procedures and processes needed to do so. Although the immediate purpose of such academic tasks is to test the students' knowledge in these two respects, an equally important purpose is to teach students how to apply these skills later in engineering practices.

Looking into the contents of the technical writing of the language course in question and the demands of the academic tasks outlined above, the researcher could see that the genre of project memo was not clearly focused on. This evidence prompted an experimentation with a pedagogical technique to draw the insights of the articulation of the socialization model and content-based instruction for the teaching of ESP. The experimentation employed CBI along with the socialization model of apprenticeship as a pedagogical tool for the inquiry. CBI, also called CLIL, characteristically involves the use of academic content area input as a resource for contextualizing language practice tailored to the communicative needs of learners in academic settings (Grabe & Stoller, 1997; Mohan, 1986; Snow & Brinton, 1988). In content-based language classes, language learning and content learning are put in tandem, and tasks —including writing ones—, are designed from academic content, which is used as an authentic resource for language practice. The instructional model identifies genres used among members of discourse communities to share knowledge within their discipline.

Once the genre is identified, the model employs it as a vehicle to make learners discover and practice the elements of that genre in a socially situated and sustained apprenticeship, scaffolded by socializing agents, such as content area professors and language teachers of writing for academic purposes (Barnard & Torres-Guzman, 2009; Berkenkotter & Huckin, 1993; Coyle, 2007). As such, proponents of CBI argue that the combined use of these two tools would sustainably align writing practices to the students' learning needs. While such arguments are pervasive in the literature, advocates of the skills-based model of writing practice still have a conventional EFL writing approach, from which writing skills could be nurtured and transplanted to other uses, such as the content area classrooms. Particularly, they would allow little or no room to bridge or connect academic writing practices and content learning. Such arguments and counterarguments on the models of writing instruction are at the core of a global educational debate across language educational contexts (Bonson, 2004; Coyle, 2007; Duff, 2007; Spack, 1988).

Despite these arguments and the promises of CBI, no sufficient studies were carried out to explore the potentials of this educational model and other instructional techniques that could be combined with it to enhance the quality of writing instructional outcomes (Bayley & Schecter, 2003; Berkenkotter & Huckin, 1993; Coyle, 2007). Particularly, no study explored the combined role of CBI and other techniques, such as the socialization model, in the Ethiopian Engineering writing classes. Hence, this study sought to investigate the synergistic role of CBI and the socialization model in enabling students to acquire tools of writing in the field of Engineering, and thereby to assess its impact, in comparison to the conventional EAP instruction, on the writing performance of the students in real-life academic writing tasks.

The following question was formulated to guide the inquiry: Does the use of CBI and the socialization model of writing instruction foster students' competence in authentic Engineering academic writing?

Methodology

Research Design

This study employed a quasi-experimental design that involved the use of two different classes in a real educational setting receiving two different instructional treatments. The researcher opted for this design as the investigation required experimenting with the role of the two packages of instruction: CBI combined with a socialization model of instruction, and skills-based writing instruction.

Population and Sampling

The population of this study were second-year students in the Faculty of Computing (n=412). Out of this population, students of Computer Engineering and Information Systems (n=127) were taken as subjects of the study through purposive sampling techniques. These students from the two streams (Computer Engineering, and Information Systems) take two same courses: Technical Report Writing (English language course), and Networking (content area course). The students, originally organized in 4 sections, were merged into two groups of Cohort 1 (63 students), and Cohort 2 (65 students). Each cohort would take lectures in a large hall, yet do practical activities in segments. This grouping was adopted in the study.

The first group (63) was labeled as a non-CBI (control) group while the second one (65) was assigned as a CBI (treatment) group. In the investigation process, the two groups received different language instructions. One of the classes received the conventional EAP instruction indicated in the course material (technical report writing), whereas the other group of students, on the other hand, received CBLI, and was labeled *CBI class*.

Treatment Procedure

Non-CBI class instruction: The EAP instruction for this group of students involved critical reading and writing practice on description, process analysis, and cause-effect relationships. Also, they were engaged in oral language practices of describing objects and natural phenomena close to their daily experience. Close monitoring and scaffolding were made on the students learning for the oral and writing practices. Also, the process approach to the teaching of academic writing was employed in their writing practices.

CBI Class instruction: Different models of CLIL are available in the professional literature. In this study, the adjunct model of CBI was employed. This model involved the integration of an English language course with a sister academic content course concurrently offered to students in the semester. The CBI learners took a course in Networking in the same semester when the target English language course was offered. Hence, an integrating framework was established to realize the CBLI.

To this end, the researcher, before the beginning of the semester, planned to use the academic content of this course as a vehicle to teach the project memo genre to the treatment group. A collaborative framework was also established with the content area instructor at the college of Computer Engineering. The instructor was informed about the purpose of the research and agreed to take any role he could play in the process. Accordingly, the language teacher-researcher briefed him with the objective of his course, its scope, the instructional techniques, and the assessment methods to be employed. From the conversation, the language teacher researcher learned that the whole instructional processes fit the purpose of the research at large.

Finally, the researcher agreed with the content area instructor to design language learning tasks based on the content area course. It was

arranged that the content-based language learning tasks be developed at an interval after the content area instructor fully covered a week's lecture on theoretical issues. Hence, every Friday, once the content teacher had covered his lectures on topics for the week, the language teacher-researcher and the content area instructor would come together and collaboratively develop a laboratory experiment, an investigation project or a field work from the contents covered. This problem would be used as both a language and a content learning task in the week to follow. This was arranged in phases, every Friday for six weeks.

During the initial phase, the researcher focused on establishing a foundation for the study by undertaking pre-planning activities and developing a collaborative framework with the content area professor. Subsequently, the instructional treatment was divided into two distinct phases. In Phase 1, the primary objective was to create awareness among the target group students regarding the requirements of their forthcoming academic tasks. Additionally, the researcher aimed to familiarize them with the significance of the project memo genre in effectively addressing these tasks. To achieve these goals, the following steps were taken:

Introduction to Academic Demands: The students were introduced to the various demands they would encounter in their future academic tasks. This involved providing them with an overview of the challenges and expectations during their project work.

*Role of Project Memo Genre***:** The researcher emphasized the importance of the project memo genre as a valuable tool for managing and organizing the processes and outcomes of their projects. The students were made aware of how this genre could facilitate their learning and enable them to effectively document their project work.

Awareness-Raising Task: To enhance the students' understanding and engagement with the project memo genre, an awareness-raising task

was designed. This task aimed to illustrate the practical applications and benefits of using project memos. Through this task, students were encouraged to explore and discuss examples of project memos, analyze their structure and content, and identify how they could utilize this genre in their own project work.

Once such preliminary works had been done, a model project memo (short technical report) was given to them. In the memo, the problem-solving procedures and the outcomes were organized following the format of the genre. The students, at this stage, were not asked to solve a problem because they had not yet fully acquired the theoretical content knowledge to carry out the projects. The awareness raising process was made through a collaboration between the researcher and the content area instructor. Yet, through this model text, the students were introduced to the rhetorical moves and linguistic features that can be employed in a project memo. The rhetorical moves characteristically involved:

(1) Introduction

A. A brief description of the subject of the project/nature of the problem/situation
B. Why the report is written
C. A road map of what is in the report

(2) Body

A. An explanation of the procedures involved in dealing with the problem (investigation, experimentation, generation of data, etc.)
B. Presentation of results
C. Interpretation of results

(3) Closure

A. Conclusion
B. Recommendations

(4) Use of appropriate linguistic tools (vocabulary, rhetorical structures, tenses, mechanics, etc.)

As part of the groundwork, the students were guided to pay attention to the components of model texts and then received an explicit instruction on the writing steps needed before coming up with the final textual piece. Also, the students' attention was drawn to the salient language structures used by the writer in the text. The ground work of introducing the project memo genre took two weeks, and meanwhile in those same weeks the students were gaining theoretical knowledge of the content area course. In the third week of the instruction, the actual practice of writing the project memo genre was started, and the students practiced the rhetorical patterns of the genre for ten weeks. During the practice, close and rigorous scaffolding was made on the part of the language teacher-researcher and the content area instructor.

Data Collection Tools and Processes

Having passed through the respective instruction modalities, the two groups of students —*CBI class* and *Non-CBI class*— were given a project work in which they were supposed to investigate a technical problem in a broadband internet network system and develop a report on (1) the whole process of the project accomplishment, (2) the outcomes obtained, and (3) the professional recommendations on the problem. Following this, they were supposed to produce a project memo for all the activities.

The project memo was assessed with respect to the students' performance in employing: (1) a brief description of the nature of the

problem and the situation, (2) explanations of the reasons why the report was written, (3) a road map of what was contained in the report, (4) explanation of the procedures involved in their investigation of the problem, (5) adequacy and clarity in the presentation of results, (6) depth of interpretation of the results, (7) soundness of conclusion and recommendations, and (8) appropriacy of linguistic tools (vocabulary, rhetorical structures, tenses, mechanics, etc.). The results of the assessments on these parameters for the two groups of learners were made in a way that would lend itself to comparative analysis.

It is important to note that the assessment tools were adopted from standard guides on technical and scientific writing (Alley, 2018; Markel & Selber, 2018). These standards are also what the faculty of computing takes as one to be followed in scientific writing.

A pre-test was administered at the beginning of the semester (before both courses began) as a way to assess group equivalence. The two groups were tested on writing a project memo with a similar level of complexity compared to the one they wrote as a post-treatment writing activity. The results of the pre-test showed that both groups of students (CBI and Non-CBI group students) performed equivalently (r, 0.86) with very little difference in their scores (5-10%).

Data Analysis

One quantitative data analysis tool, namely, t-test, was employed to analyze the data in this study. The t-test was run to compare the performance of the *CBI* and the *Non-CBI* group learners in the use of the project memo genre in organizing their reports of the project accomplishments. The results were ultimately meant for assessing the impact of the CBLI on the development of the academic language skills relevant to the academic life of the students.

Results

Table 1. Comparison of *CBI* and *Non-CBI* students' writing performance in using the project memo genre in project report writing

Units of Assessment	Groups	N	Mean	Mean Difference (MD)	T Value	Sig. (2-tailed)
Statement of the nature of the problem	CBI	65	18.97	6.59	17.81	.001
	Non-CBI	63	12.38			
Statement of report purpose	CBI	65	18.89	7.51	20.29	.0031
	Non-CBI	63	11.38			
Statement of contents of the report	CBI	65	16.56	4.55	13.76	.001
	Non-CBI	63	12.1			
Statement of procedures	CBI	65	18.22	6.22	15.86	.016
	Non-CBI	63	11			
Presentation of results	CBI	65	17.5	2.5	1.93	.067
	Non-CBI	63	15			
Use of linguistic tools	CBI	65	18.92	4.76	9.71	.021
	Non-CBI	63	14.16			
Interpretation of results	CBI	65	14.59	4.74	11.28	.014
	Non-CBI	63	9.85			
Conclusion and recommendations	CBI	65	19.03	3.62	6.15	.0371
	Non-CBI	63	14.25			

- P Critical at 0.05

The results in the table above reveal that the students who passed through the content-based language teaching performed far better than the control group learners in organizing their reports. This difference in performance between the two groups is reflected across the units constituting the project memo genre.

The *CBI class* showed better performance in composing the introduction of the report. Among the marked differences in this respect is the ability of this group of learners in statement of the nature of the problem investigated with better clarity (MD, 6.59; P, 0.01). Also, the *CBI class* stated the purpose (MD, 7.51; P, 0.031) and the contents of the reports in the introduction (MD, 4.55; P, 0.01) with proper brevity. In contrast, the *Non-CBI class* started their report by merely stating the name of the project without showing any of the components of the introduction. If they mentioned these components, they entangled them in one statement, inhibiting the flow of the ideas to move forward. Further, the *CBI class* managed to make a smoother flow of the statement of the procedures involved in the investigation of the problem (MD, 6.22; P, 0.016) in which learners clearly demonstrated the steps they passed through to resolve the problems at hand.

Of course, little difference was visible in the clarity of presenting results (MD, 2.5; P, 0.67; > 0.05). Yet a significant difference was found out in their depth of analysis of the interpretation of the outcomes (MD, 4.74; P, 0.014; <0.05), in their use of linguistic tools (MD, 4.76; P, 0.021), and soundness of concluding statements (MD, 3.62; P, 0.0371.). This difference in performance of the two groups clearly shows the positive impact of the CBLI on learners' project memo genre awareness and the degree of the knowledge transfer made to the real-life writing setting.

Discussion

The evidence substantiates the claims of the socialization model of writing instruction, which can complementarily be combined with content-based writing pedagogy. This view holds that cognitive academic language skills, particularly academic writing skills, can be fostered through purposeful communicative activities made in response to what a learner is trying to express (Sawyer & Watson, 1987), and the purpose of that expression is embedded in the communicative activities of a discourse practice where actors of the communicative process have roles to play (Benesch, 1988; Berkenkotter & Huckin, 1993; Russel,

1995). According to these writers, this purpose for communication, for example, the purpose for writing, should be a social purpose in which a need exists from both the students' and teacher's point of view. In addition, students get apprenticeship into the discursive making of purposeful communication through meaningful interaction among the members of the social setup.

Consistent with these theoretical claims, the results in the study suggest that the socialization model and content-based writing practices which involve authentic writing activities gave students the opportunity to discover and develop the very rhetorical structures and discourse tools employed in tasks where they write in response to real problems. It also implies that the intensive practices in the project memo genre of problem solving and the continuous scaffolding from both the content instructor and the language teacher-researcher gave them the chance to retain and transfer the academic language skills to other learning tasks far more easily than did those learners who passed through the conventional approach to EAP instruction.

In the writing process and the feedback on their assignments, the experimental group of students had rich interaction with the writing teacher and content area professor as major agents of socializing them into the discourse of disciplinary writing. Also, they had extensive interaction among themselves in the writing and rewriting of their project based on the feedback they received. In these processes, the students came to discover (1) why those kinds of texts are written in response to the academic task, (2) how they should compose such disciplinary writings, and (3) the manner and situation in which the texts are read and assessed. Such gains are evident in the contents of their final writing, in which they —students in the experimental group— demonstrated marked cognitive fluency in composing a text in response to an authentic academic task.

Conversely, the conventional approach to the teaching of English for academic purposes, though develops general skills for composing texts of description, process analysis and cause-effect relationships, falls short of the potential to enable the learners to transfer these skills to the academic tasks they encounter in their academic studies. This is mainly because the conventional approach bases itself on the assumption that a mastery of general language skills in these writing practices will lead to success in carrying out other academic activities across courses in their Computer Engineering studies. Of course, the students, who passed through the conventional EAP instruction, mastered these skills with varying degrees. This is evidenced by the marks they scored in the course they were taught, through teaching materials designed for the conventional teaching of EAP. Yet these students were not up to the level expected when it came to the use of rhetorical tools to accomplish project memo writing tasks, which are prevalent across courses at all levels of the Computer Engineering School.

This gap in the conventional EAP instruction is also consistent with the research findings and critique leveled by CBI researchers and socialization model of learning theorists against this type of instruction (Braine, 1989; Currie, 1993; Horowitz, 1986; Shih, 1986). According to these writers, conventional EAP instruction requires students to draw on their experience or to synthesize facts and ideas from multiple sources. Also, the materials and learning tasks in conventional EAP syllabi may sometimes comprise a set of different, unrelated topics, making it difficult for students to create a consistent community corpus and social purpose for communication. This is visible in the teaching materials of the conventional EAP course material in question. In those didactic resources, the students are supposed to write descriptions of places, objects, persons, writings of process analysis, and cause-effect relationships of a natural phenomenon in their daily experiences. These writings are merely for the sake of practicing writing than a writing practice with purpose for communicating meanings for a defined community of readers in a discourse community, or to use the words of constructivists and CBI theorists, these activities are not surrounded by

the necessary social community that exists in content courses —the community that acts to elicit those tasks and guides students in determining the tasks' expectations.

Hence, the results from the experimentation suggest that content-based language teaching is an available approach to address the deficiencies of the conventional teaching of English for academic purposes by raising students' awareness of linguistic and discourse tools, enabling successful writing in the disciplines, and thereby, aligning the writing practice to the students' learning needs. Also, the results of the study shed light on the fact that academic writing skills are manifestations of socially determined ways of sharing knowledge and are acquired through a contextual practice which conceives learners as social participants of knowledge construction and provides the how of communicating this knowledge to a defined audience with expectations characterizing standards of text composition in the specific disciplinary discourse.

In other words, the development and transferability of academic skills does not arise from a mere teaching of rhetorical skills. Rather, the development of writing competence for such practical purposes is the result of how knowledge is shared in a given discourse community, what needs to be communicated, why it is communicated, and to whom it is communicated. Furthermore, it shows that students acquire these academic language skills better in a language learning milieu that closely approximates the real academic communications prevailing across the academic classrooms. Creating such learning contexts has not been a common practice in EFL settings, especially in engineering classes in Ethiopia, and has even been taken to be impossible. This has made it difficult in EAP instruction to target those academic language skills and transfer them to the actual academic writing settings. Yet the combined use of CBLI and the socialization model of genre theory proved promising in targeting those skills and socializing students into the

disciplinary discourse community by placing students in language practices within the exigencies of their academic settings.

Finally, the findings of this study show that, given the nature of academic language skills, conventional approaches to the teaching of languages for academic purposes need further critical examination, and there needs to be a move from material writers and EAP practitioners to draw these insights for instructional and material writing purposes.

Conclusions and Educational Implications

Meeting realistic needs of language learners is one of the major challenges of writing instruction in EFL/ESL higher learning settings. This is largely because of the over-influence of the cognitive-leaned pedagogical approaches to academic writing instructions in many EFL educational practices. Such approaches take writing as a process of developing discrete cognitive skills of composing texts in EFL/ESL classes and transplanting them to language use settings such as academic content learning avenues. The assumption, among others, disregards any mechanisms of bridging or connecting the language practice context (EFL writing class) and the skills use context (content area learning processes).

The package of pedagogical tools employed in this study, taking a social-constructivist scientific lens, overcomes the deficiency of this conventional approach to the teaching of writing for academic purposes. It was found out that academic writing skills better developed in a socially embedded practice context where learners experience writing as a tool of knowledge construction, knowledge sharing, and discovery of the conventions of communicating scientific information through scaffolds from socializing agents.

Evidence shows that developing academic writing skills among students is a shared responsibility of EFL writing teachers, content area

professors and the students themselves. Thus, higher education institutions need to be aware of the role of different actors for such educational ends. Thus, academic institutions need to make more moves to use such pedagogical insights as a means to enhance the quality of writing instructional processes and outcomes. As one of such moves, content area professors need to be trained and made aware of roles in socializing learners to academic writing conventions.

Further, EFL writing teachers and material writers need to draw these insights in teaching and designing syllabi for Science and Engineering writing. The materials particularly require considering mechanisms to (1) align the writing needs of students with possible writing practices in content-area courses, (2) devise meaningful pedagogical mechanisms of bridging and connecting the writing practice and the content area learning processes, (3) identify and define the specific roles that EFL teachers, content-area professors, and students can play in this process, and (4) establish a collaboration and interaction framework for these actors. Finally, academic institutions need to support such processes and set standards for these instructional processes and their outcomes.

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