

Adopting Cognitive Academic Language Learning Approach (CALLA) to Develop Algerian Doctoral Students' Academic Writing Achievement

Adoption de l'approche cognitive de l'apprentissage académique des langues (CALLA) pour développer les performances des doctorants algériens en matière d'écriture académique

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Abstract

This paper sheds light on the Cognitive Academic Language Learning Approach (CALLA) principles, to diagnose Doctoral students' difficulties, and to underline the possibility of adopting the CALLA model to monitor and enhance Doctoral students' academic writing. The study's main objectives are to spotlight on the cognitive strategies students need to use on the one hand and suggest the application of the model's modules, namely the appropriate learning strategies, development of academic language and a related curriculum to their specialty and research field on the other hand. To reach these objectives, a mixed qualitative and quantitative research design is selected. Preliminary results showed that the CALLA model's phases were partly used by a wide range of students. Additionally, to promote their academic and scientific writing skills, content-based instruction can be adjusted using this model.

Keywords: Academic achievement - CALLA Model -cognitive strategies -EAP-content-based curriculum.

Résumé

Cet article met en lumière les principes de l'approche cognitive de l'apprentissage du langage académique (CALLA) dans l'optique de diagnostiquer les difficultés des doctorants et souligner la possibilité d'adopter le modèle CALLA pour suivre et développer l'écriture académique des doctorants. Les principaux objectifs de l'étude sont, d'une part, de mettre en lumière les stratégies cognitives que les étudiants doivent utiliser et, d'autre part, de suggérer l'application des modules du modèle, à savoir les stratégies d'apprentissage appropriées, le développement du langage académique et un programme d'études lié à leur spécialité et à leur domaine de recherche. Pour atteindre ces objectifs, un modèle de recherche mixte, qualitatif et quantitatif, est sélectionné. Les résultats préliminaires ont montré que les phases du modèle CALLA sont partiellement utilisées par un large éventail d'étudiants. En revanche, pour développer leurs compétences en rédaction académique et scientifique, l'enseignement basé sur le contenu peut être adapté à l'aide de ce modèle.

Mots- clés : Résultats académique- modèle CALLA-stratégies cognitives-EAP-programme d'enseignement basé sur le contenu _____

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Introduction

In order to promote their learning, EFL students need to promote their study skills. That is why the learners' choice of the learning strategies to use and develop can help them to use the target language and make learning easier, faster, more enjoyable, more self-directed, more effective and more transferable to new situations (Cohen 1998, p. 5). This implies developing the students' learning strategies and then being more autonomous when they advance in the training (Idri, 2015). Many scholars who worked on language learning strategies (LLSs) developed theoretical frameworks that are nowadays fundamental in any research related to this field (O'Malley et al., 1985; O'Malley & Chamot, 1990; Oxford, 1990a, 1990b; 2018; Oxford & Amerstorfer, 2018; Rubin, 1975; Stern, 1975; Tarone, 1977). Although their categorisations differ in labels, they all resorted metacognitive and cognitive strategies as part of the main strategies learners need to use and develop. According to Oxford (1994), around two dozen L2 strategy classification systems have been divided into various classes with different emphasis and outcomes among the systems. The existence of such "distinct strategy typologies indicates a major problem in the research area of L2 learning strategies: lack of a coherent, well accepted system for describing these strategies" (Oxford, 1994).

1. Review of Literature

The concept of Language Learning Strategies (LLSs) was initiated in the mid-seventies to refer to any technique or device a learner can use to acquire knowledge (Rubin, 1975). They are "the moment-by-moment techniques that the learner employs to solve "problems" posed by Second language input and output" (Brown, 2000, p. 122). Such strategies are said to be goal-oriented, problem-oriented, specific to actions learners use, and consciously selected (Oxford, 1990b). They are proved to be important for L2/EFL learning and teaching because they develop learning autonomy, language competence, and they are tools for active and self-directed involvement (Pineda, 2010) that learners use "to facilitate their learning and recall linguistic and content area information" (Chamot, 1987, p. 71). Besides, the use of LLSs is positively linked to language proficiency (Abu Shmais, 2003); Talbi, 2019). According to Talbi (2019, p. 68), the more proficient the learners are, the more successful they are in using a variety of cognitively complex strategies; while learners who are less knowledgeable or successful in the TL tend to switch to a limited number of strategies, most of which are usually less demanding cognitively. Moreover, in an era of communicative, interactive, learner centered classroom, learning strategies simply cannot be overlooked. Students need to have the necessary strategic competence to hold their own in the give and take of meaningful communication (Cherik & Aliouchouche, 2023)

Among all the current language learning strategy taxonomies, Oxford (1990b) provides the most extensive classification of LLSs involving two major LLS categories; the direct and the indirect strategies. Whereas the former refers to the activities that have a direct influence on the learning process, such as memory, cognitive, and compensation strategies, the latter refers to the activities that have an indirect influence on the learning process, such as metacognitive, affective and social strategies (Pineda, 2010). Though the taxonomy is not that perfect; yet, it is the most useful, practical and comprehensive guide for teachers (Brown, 2000, p. 131).

2. Method

The section at hand is devoted to the methodological part where the research context, sample and adopted methods are presented.

2.1. Context and Sample

Doctoral thesis writing is a complex undertaking that requires not only language proficiency but also a strategic approach to research and writing. Recognising that doctoral students rely on both cognitive strategies (e.g., summarising, deductive reasoning, note-taking) and metacognitive strategies (e.g., planning, organising, self-monitoring) during this process (Oxford, 1994), this mixed-methods study explored the application of the CALLA to support their thesis writing development.

The study involved 40 EFL doctoral students from diverse backgrounds (Algeria, UK, Jordan) who were in various stages of their thesis work. Most participants (63.16%) were between 24 and 28 years old and were enrolled in Algerian universities, with some studying abroad on scholarships in the UK and Jordan. The study employed a three-stage approach, beginning with qualitative participatory observation of focus groups, followed by quantitative analysis using the Cognitive and Academic Advanced Language Learning Questionnaire (CAALLQ).

2.2. Data Collection Procedure

This paper focuses on the cognitive and metacognitive strategies used by doctoral students during the research and writing process. Doctoral students are expected to utilise cognitive strategies (such as summarizing, deductive reasoning, note-taking, and inference) as well as metacognitive strategies (such as planning, organising, self-monitoring, and evaluating) when designing research and producing academic materials (Oxford, 1994).

The study followed a mixed-methods approach. The first stage involved qualitative participatory observation through focus groups, conducted during question-and-answer sessions led by the instructor. To identify the main difficulties students faced in terms of research and writing, a roundtable discussion was held where participants suggested research topics and engaged in an open debate. Researchers took notes of the discussion according to the five stages of the CALLA model.

The second stage of the study was quantitative, utilizing a scale developed based on Cummins' (1984) classification of language and content activities and the CALLA model (Chamot, 2005). The final stage will involve suggesting the application of the CALLA model in Algerian doctoral programmes to monitor student progress.

For the focus groups, the observation was made during the Question and Answer (Q&A) teaching style adopted by the instructor. For the latter, to diagnose the main difficulties of the students in terms of research steps, stages and writing, a round table where every participant suggested the chosen topic for research was adopted. Questions were asked and answered in an overt debate. The researchers took notes of the discussion according to the five stages of the model.

The Questionnaire was constructed by the researcher via the Qualtrics website. Its items were developed according to Cummins' (1984) classification of language and content activities and CALLA model (Chamot, 2005). The scale's name is the Cognitive and Academic Advanced Language Learning Questionnaire (CAALLQ). The questionnaire is divided into four parts; the three first parts are 5- Likert scale questions based on a scale from 1="strongly disagree" to 5="strongly agree" and the last part is related to the participant's profile. The four sections of the questionnaire are entitled: (1) "Reading Strategies and Written Resources", (2) "Writing Strategies", (3) "Instruction Strategies Steps, and (4) "Demographic Information".

The questionnaire was posted online and online responses were also saved via the same link. Forty EFL Doctoral students (Algeria, UK and Jordan) responded to the questionnaire (N=40) whose age range varies between 24 and above 35 years old. The majority of them (63.16%) were between 24 and 28 years old. Most participants were in their three first years of study: 35.14% first year, 21.62% second year and 27.03% third year. The remaining informants 16.21% were above their third year of Doctoral studies.

The Doctoral students who responded to the questionnaire are registered in various Algerian universities namely: Bejaia, Tizi Ouzou, Oran, Sidi Bel Abbes, Algiers, Blida, Tlemcen, Annaba, Batna, Oum El Bouaghi. Some of the participants are students who benefit from the scholarship and are registered in the UK and Jordan Universities.

All in all, the main aim behind this mixed-method research is to explore the terrain about how Doctoral students go through the research process while conducting research studies. Light is shed on reading and writing on the one hand and academic skills on the other hand. By the end of the investigation, the strategies chosen by Doctoral students are resorted. Then, the cognitive strategies students need to use are highlighted on the one hand and suggests the application of the model's modules, namely the appropriate learning strategies, development of academic language and a related curriculum to their specialty and research field are suggested on the other hand.

In CALLA, students are taught the use of LLSs derived from a cognitive model of learning to help them comprehend and retain both language skills and concepts in the content areas. CALLA, as based on the cognitive approach, can be adopted by teachers with mixed classes of native and non-native English speakers (Chamot & O'Malley, 1996). This is one of the reasons behind selecting this approach as strategy instruction model for Doctoral students, mainly during their two first years of instruction. Many researchers present an overview of the model (Rasekh, & Ranjbari, 2003; Danilewicz et al., 2016; Gu, 2018), and recommend using CALLA to promote a number of skills, like critical thinking (Huzairin & Hery Yufriзал, 2019), reading, (Al-Ghazo, 2016); Prakoso, 2016), and writing (Huzairin & Hery Yufriзал, 2019). In this research, the need to use CALLA is to overcome students' difficulties in writing up their theses. The stages can be developed to fit this aim and can be adjusted according to students' level of proficiency.

3. Results

Since the sample of this research consists of Doctoral students whose language of instruction is EFL, the focus is put on skills, such as, reading and writing skills. It is important to mention that in Algeria, a pre-requisite for Doctoral students is to follow at least a Master Degree in English before passing the test to have access to any Doctoral programme.

Master programmes in Algeria initiate students to research in the "Methodological Unit" that is given much credit (9 credits). Students are supposed to write a thesis and defend it publically in front of a jury. This constitutes 30 credits of the fourth semester of a Master Degree; and this is applicable for most Master Degrees of English in Algeria. Bachelor of Arts (BA) and Masters in English are taught in the English language, and Master dissertations are written in English too. Hence, students are supposed to have acquired the general English level that helps them move to academic English.

Since General English is supposed to be acquired by the sample population, reading, writing and instructional strategies are focused on in the questionnaire.

3.1. Focus Groups

Focus groups are used as part of the taught programme, but the teaching strategies were adapted to the CALLA model. The teacher-researcher tried to monitor learning and tried to use the Q&A to elicit the students' cognitive and metacognitive strategies. This stage is used to pilot

the feasibility of the topic and to delimit the kind of strategies we need to concentrate on. The results of this stage served to re-visit the Cummins' (1984) classification of language and content activities and CALLA model (Chamot A. , 2005) and adapt it to our sample.

The focus groups were applied with first-and-second-year Doctoral students. Results showed that students were at the "Preparation phase". This means that students should be trained to reach higher levels (presentation, practice, self-evaluation, expansion, and assessment), so that they can enhance the necessary skills for their thesis writing and accomplishments.

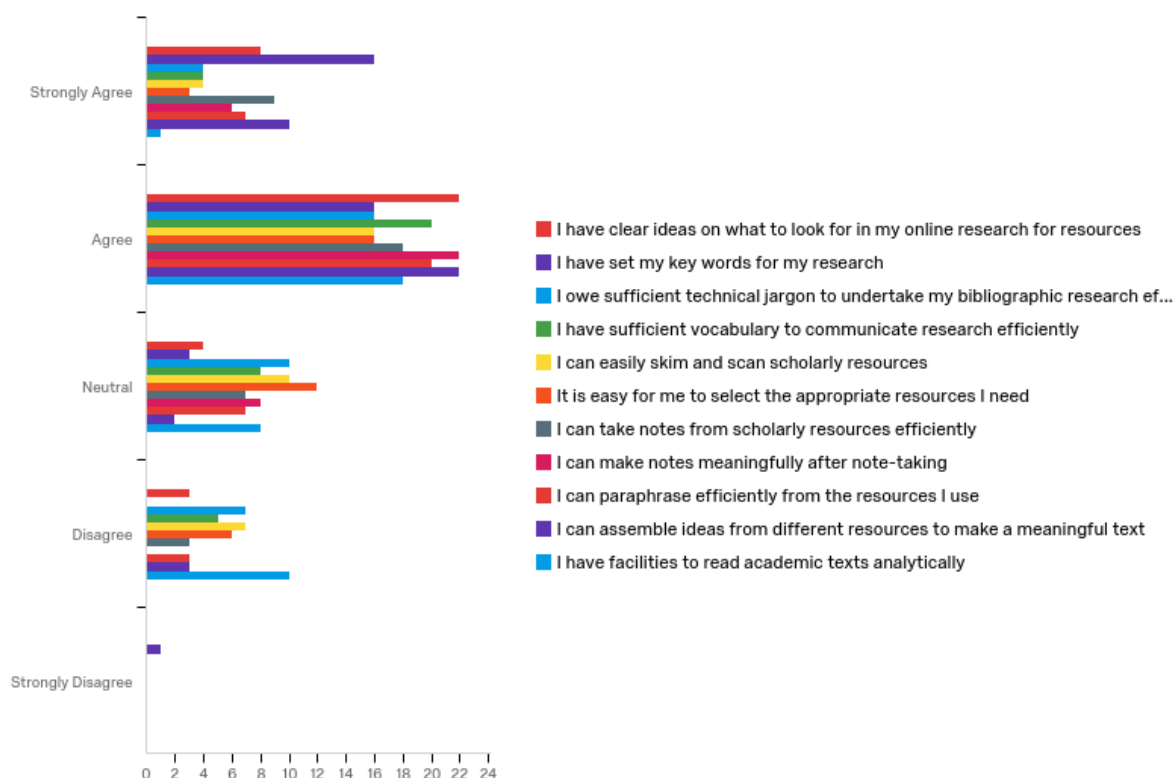
According to the course development stages, a number of themes appear as the most challenging elements that hinder most students to get started in writing up their research: (a) bibliographic research challenges, (b) need for reading strategies, (c) Focus on Written resources, (d) topic selection and narrowing down, and (e) planning for research.

In order to understand better these challenges, a scale is used following the chosen frameworks (Cummins, 1984; Chamot, 2005) (see appendix 1). In what follows, results of each part of the scale are summarised with their related items.

Part 01: Reading Strategies and Written Resources

Q1 - Say How do you agree or disagree with the following statements

Figure 1. Reading Strategies and Written Resources Use among Doctoral Students



This part of the questionnaire focuses on study skills, reading strategies use and writing resources use and manipulation. In this part, we tried to select a number of reading strategies (predicting, skimming, scanning, inferring,) and research skills. As displayed in figure one or Table 1, we notice that the respondents manifest a level of agreement with the use of reading

and writing strategies during their researches' process. The numerical data included in the table below certifies this conclusion.

Table 1. Students' Agreement Rate on Reading Strategies and Written Resources Use

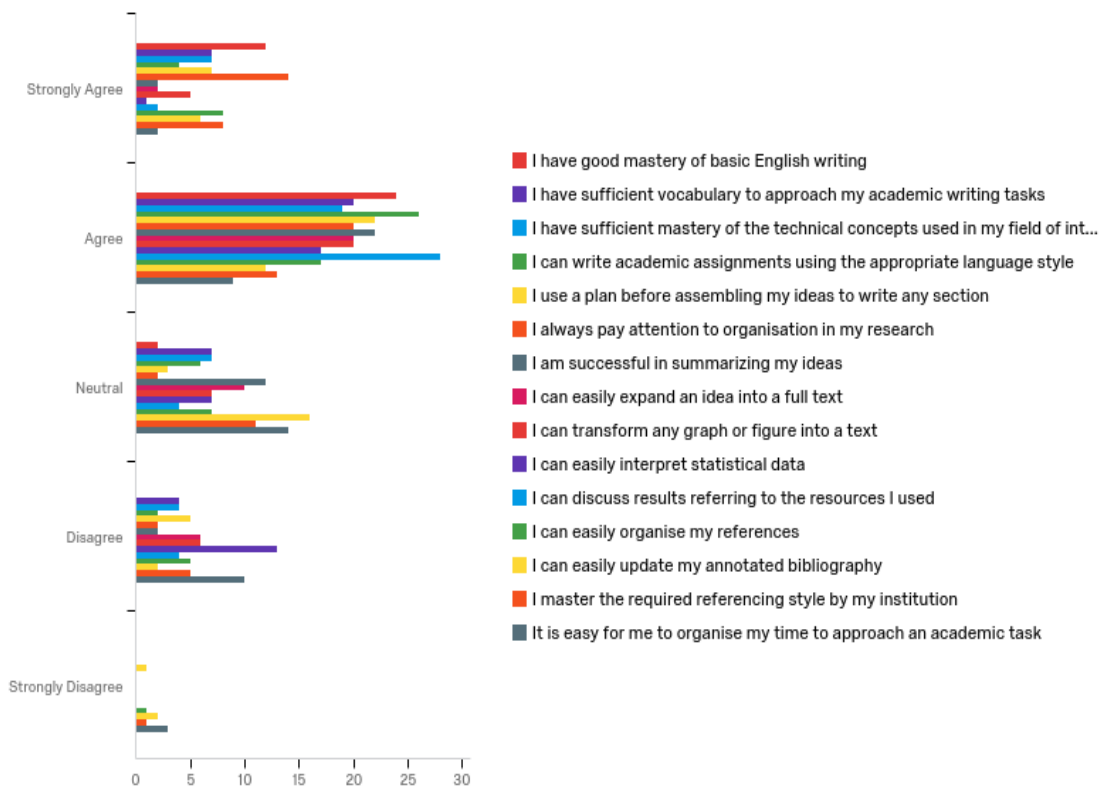
Item	N°	%
I have clear ideas on what to look for in my online research for resources	26	65
I have set my key words for my research	30	75
I owe sufficient technical jargon to undertake my bibliographic research efficiently	20	50
I have sufficient vocabulary to communicate research efficiently	23	57.5
I can easily skim and scan scholarly resources	20	50
It is easy for me to select the appropriate resources I need	18	45
I can take notes from scholarly resources efficiently	26	65
I can make notes meaningfully after note-taking	26	65
I can paraphrase efficiently from the resources I use	26	65
I can assemble ideas from different resources to make a meaningful text	29	72.5
I have facilities to read academic texts analytically	18	45

As explained above, it is noticeable from the statistical data in table 1 that the participants reveal being able to set key words related to their research (75%) and assemble ideas from different resources so as to write a meaningful text. Moreover, 65% of them asserted being able to look for the appropriate resources online, take notes and make them efficient to fit their research scope via their ability to paraphrase what they read. A portion of the informants (57.5%) declared that they have sufficient vocabulary to communicate their ideas efficiently, but half of them only have sufficient technical jargon to make their bibliographic research. However, less than the half of the students (45%) find it easy to select the appropriate resources they need and this is confirmed through the same rate of the participants who do not seem to have facilities to read academic texts in an analytical way.

Part 02: Writing Strategies

This part of the scale focuses on the use of writing strategies students, mainly those related to cognitive and metacognitive strategies. To generate the needed data, the participants are asked to express their level of agreement, or disagreement on a number of statements linked to their manipulation of some writing strategies during the research process.

Figure 2. Writing Strategies Use among Doctoral Students



At first glance, Figure 2 indicates that respondents exhibited a high degree of satisfaction with the use of writing strategies during their research process. To further support this conclusion, the following table is presented.

Table 2. Agreement Rate on Writing Strategies Use

Adopting Cognitive Academic Language Learning Approach (CALLA) to Develop Algerian Doctoral Students' Academic Writing Achievement

Item	(N°)	%
I have good mastery of basic English writing	34	85
I have sufficient vocabulary to approach my academic writing tasks	27	67.5
I have sufficient mastery of the technical concepts used in my field of interest	26	65
I can write academic assignments using the appropriate language style	30	75
I use a plan before assembling my ideas to write any section	29	72.5
I always pay attention to organisation in my research	35	87.5
I am successful in summarizing my ideas	35	87.5
I can easily expand an idea into a full text	38	95
I can transform any graph or figure into a text	28	70
I can easily interpret statistical data	25	62.5
I can discuss results referring to the resources I used	33	82.5
I can easily organise my references	28	70
I can easily update my annotated bibliography	21	52.5
I master the required referencing style by my institution	25	62.5
It is easy for me to organise my time to approach an academic task	24	60

As shown on the table, Doctoral students seem to be more confident in writing as a skill since they can expand an idea into a text easily (95%), can summarise their ideas (87.5%), master writing basics in English (85%), and can write academic assignments using the appropriate style (75%). As for the research process level that specifies the sample in terms of language use and the needed strategies to adopt and develop, participants displayed ability mainly in organising their research (87.5%), summarising ideas (87.5%), discussing results (82.5%), planning ideas before writing (72.5%), transforming graphs into a text (70%), and organizing their references (70%).

To a less extent, Doctoral students have sufficient vocabulary to work out their academic tasks (67.5%) with sufficient mastery of technical concepts (65%). Additionally, they manifest their ability in interpreting statistical data (62.5%), in adopting the referencing style of their institution (62.5%). The least rates we received are associated with time organization and updating the annotated bibliography. More than half of the respondents (60%) can organize their time to approach an academic, and 52.5% of them can easily update their annotated bibliography.

Part 3: Instruction Strategies Steps

This final part is meant to ask questions about learning strategies use and test the learners' metacognitive awareness of strategy use and development while conducting and writing research. The items can also help to collect data about the possibility of applying

CALLA as a model of instruction. The results displayed in Figure 3 and Table 3 report the participants' responses to the following question.

Q3 - Say how appropriate of you is each of the following statements in the process of writing your research paper/thesis

Figure 3. Instructional Strategies and CALLA Use

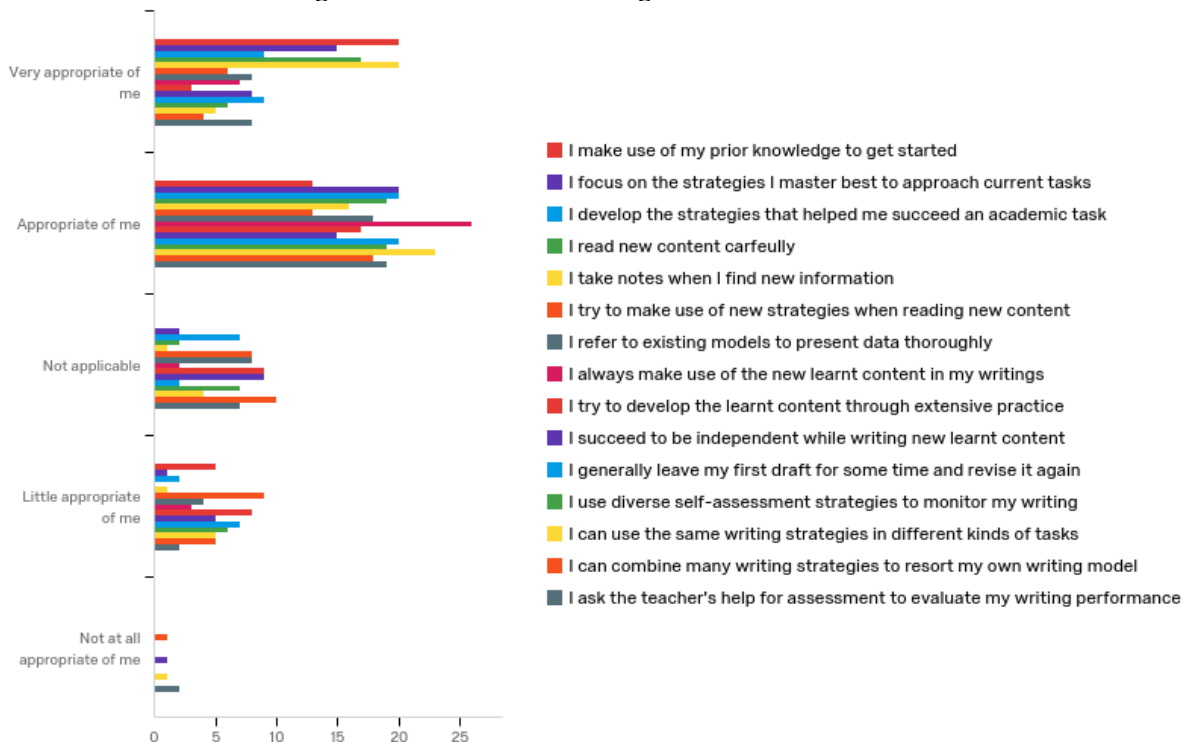


Table 3. Agreement Rate on Instructional Strategies and CALLA Use

Adopting Cognitive Academic Language Learning Approach (CALLA) to Develop Algerian Doctoral Students' Academic Writing Achievement

Item	(N°)	%
I make use of my prior knowledge to get started	32	80
I focus on the strategies I master best to approach current tasks	33	82.5
I develop the strategies that helped me succeed an academic task	28	70
I read new content carefully	34	85
I take notes when I find new information	36	90
I try to make use of new strategies when reading new content	18	45
I refer to existing models to present data thoroughly	24	60
I always make use of the new learnt content in my writings	34	85
I try to develop the learnt content through extensive practice	19	47.5
I succeed to be independent while writing new learnt content	22	55
I generally leave my first draft for some time and revise it again	29	72.5
I use diverse self-assessment strategies to monitor my writing	25	62.5
I can use the same writing strategies in different kinds of tasks	28	70
I can combine many writing strategies to resort my own writing model	23	57.5
I ask the teacher's help for assessment to evaluate my writing performance	25	62.5

Table 3 shows clearly that Doctoral students make use of learning strategies and have a considerable degree of metacognition. The numerical data demonstrates that most participants (80%) make use of prior knowledge, use the strategies they master better in order to approach any new information and task. In this, 90% of the participants take notes when finding new information; yet, when reading a new content, they generally read carefully (85%) and, then, use it in new writings (85%). Participants succeeded in doing so by focusing on the strategies they master better to approach the current task (82.5%) and made use of prior knowledge to start the writing task (80%). Such strategies and skills are directly linked to the preparation and the presentation stages of the CALLA model. Then, students try to develop the strategies that helped them to succeed in prior tasks (70%). However, results fluctuate when reaching the practice, self-evaluation, expansion and assessment stages. When students were asked to manifest their abilities towards these stages, a portion of them (45%) try to make use of new strategies when reading new content and the remaining portion of students (60%) referred to existing models to present data thoroughly. Most participants (52.5%) demonstrated that they are less likely to develop the new learnt content through practice; only 47.5% tried to and succeeded to be independent in writing new content (55%). As for evaluation, the majority of Doctoral students, 72.5%, revise their draft, and 62.5%, of them use self-assessment strategies. At the level of the expansion stage, students showed ability to use the same writing strategies in different kinds of tasks (70%) and can combine different writing strategies to resort their own writing model (57.5%). Finally, most students (62.5%) asked for help for the sake of assessment and referred to their teachers to evaluate their writings.

4. Part 4. Discussion of the Results

This paper tries first to explore the terrain about Doctoral students' difficulties while conducting research, and their strategy use and awareness before moving to applying the CALLA model as a means of instruction. To reach this target, items about an intermediate academic level of English and study skills' mastery are advanced in the first two parts of the questionnaire. The participants replied that they were able to self-direct their research in mastery of Basic English and in online research and conceptual framework (key words and vocabulary). This step is essential since much of the academic English literature has focused on the importance of words students must comprehend in order to access the concepts associated with a particular discipline (DiCerbo, Anstrom, Baker, & Rivera, 2014). However, some other students, according to the findings, meet difficulties in: (a) skimming and scanning information, (b) note-taking and note-making, (c) using the technical jargon specific to their field of interest, (d) being efficient in skimming and scanning, (e) having unclear ideas on what documents to select, (f) Paraphrasing, (g) Reading academic texts.

According to Chamot and O'Malley (1996), such difficulties are mainly related to the cognitive and the metacognitive problems that students may encounter. For instance, in this case, students seem to have faced difficulties at the planning stage (preview, skim and gist), at the organization stage (plan what to outline), and at the stage related to selective attention (selective reading and find specific information) stages. In O'Malley's learning strategies classification (Chamot & O'Malley, 1990), cognitive strategies involve the manipulation or transformation of the material to be learned, such as resourcing, repetition, grouping, deduction, imagery, auditory representation, key word method, elaboration, transfer, inferencing, note-taking, summarising, and recombination. Hence, students need to be taught how to develop such strategies to overcome the detected problems. Students showed a considerable degree of metacognition during their research process. They seemed to possess strategies used at a certain level of their research; however, they need to be taught how to link the strategies they have been using and the strategies they need to develop when trying to acquire a new knowledge related to their research works.

In this context, Chamot (2009) made a clear demarcation of the student's responsibility vs the teacher's responsibility. Whereas the teacher should gather information about his/her learners as far as their interests, their motivation and their learning styles are concerned (Abu Shmais, 2003), students' role is focused on being responsible for his own learning. That is, the student should take his/her responsibilities through attending, participating and applying strategies with guidance at the first level, then, self-assessing these strategies, using them independently and transferring them to new tasks at a more advanced level. Such elements are present in the findings and students showed that they make use of their strategies and try to be independent. However, the lack of strategy-instruction in the Algerian Doctoral programmes seems to be the main obstacle behind moving forward efficiently by the same Doctoral students. It is true that Doctoral programmes in the LMD system in Algeria are motivated by two years of training; yet, strategy instruction is still not given much importance in the curricula.

We can evoke the study conducted by Berbar (2023) who emphasizes the importance of time management and supervisor support in mitigating writing anxiety. She found that the lack of time devoted to writing and the lack of guidance and feedback from supervisors were significant contributors to anxiety among students. Similarly, the current research identifies time constraints and the need for structured guidance (addressed through CALLA implementation) as crucial factors in doctoral students' research and writing processes.

Back to Chamot's CALLA framework for strategies instruction, she relates each of the CALLA stages to a responsibility a teacher should take. Accordingly, the teacher needs to activate the learners' background knowledge at the preparation stage, introduce LLSs and model them at the presentation stage, use and provide feedback on strategy use at the practice stage, assess strategies at the self-evaluation stage, and finally support transfer and apply it at the expansion stage. Previous studies supported that if learners are made aware about the strategies' use that facilitates their learning, they should be familiar with the strategies that are available (Rasekh & RanjbarI, 2003). When getting through the students' responses, many can be done to enhance their skills and competences in research accomplishments if these steps are applied and monitored by the teachers. In this, Idri (2015, January 16) b) identified several writing difficulties faced by Algerian EFL students, including issues with accuracy (coherence, cohesion, basic writing skills, grammar), academic style (conventions, formal register), cultural influences (code-switching, language interference), and methodological understanding (research design, analysis). To cope with such issues, Idri's recommendations call for addressing these challenges by means of teaching EAP, tutoring learners, and focusing on writing skills transfer, resonate with the current study's emphasis on the CALLA model. Berbar's (2023), eventually, calls for interventions that move beyond traditional academic systems and foster a more student-centered approach to learning. Both approaches advocate for structured instruction and support to help students develop the necessary competencies for academic writing.

When we say teachers, we refer to a teacher who is trained in strategy instruction and is a member of the trainers of the Doctoral committee and the supervisor who can also adopt the CALLA stages at each step in the research cycle. For the latter, the process can go from three years to five years of work. Hence, CALLA can accompany them in the supervision process all along this Doctoral programme life-cycle.

If we go back to the results, the preparation stage of CALLA is acquired and used by the majority of the students, since they could (a) identify their objectives, (b) elicit their prior knowledge to move forward, and (c) have sufficient vocabulary. As for the presentation stage of CALLA, it has been shown that it is acquired and used by the majority of the students, since they could (a) present information in various new ways, and (b) relate their prior knowledge to new content. At the self-assessment stage and the expansion stage, beginner Doctoral students need more monitoring, and the CALLA can be structured specifically to develop academic literacy and production.

Furthermore, strategies' use seems to be existent in the majority of the participants, though some of them need more practice and monitoring to develop their academic skills, mainly in bibliographic research, referencing, and data analysis. That is why, CALLA could be the appropriate model because it integrates academic language development, content area instruction and explicit instruction in learning strategies for both content and language acquisition.

All in all, there are three modules of CALLA including learning strategies, development of academic language and a related curriculum. Doctoral programmes in Algeria encompass all the three because cognitive strategies and metacognitive strategies are needed while teaching both a subject-based or a content-based curriculum. During all the Doctoral training, academic language is all what students do. This is particularly relevant in the Algerian context, where the study found that a lack of strategy instruction in doctoral programs may be hindering students' progress (Hellelet, 2021). She highlights the fact that learners who can effectively process information, utilise prior knowledge, and monitor their own understanding are more likely to achieve academic success. However, the author also notes that the traditional academic system,

with its emphasis on rote memorization and quantity over depth of understanding, can hinder the development of these important metacognitive skills.

5. Part 5. Implications

After diagnosing a number of Doctoral students' difficulties when conducting their research in the Algerian context, this paper is a window to suggest the application of the CALLA model and techniques for strategy instruction specific to academic English, content goal-oriented and research-based topics. Additionally, this paper comes to analyse the current strategies students use on the one hand and identify the ones compatible with CALLA on the other hand. In accordance with, this work is introduced as a paper in progress. Its second phase is suggesting the parts of the model that can accompany strategy instruction specific to the Doctoral programme students follow. Hence, since CALLA's principles can fit the context, we have focused on, we suggest to:

- work with colleagues to integrate CALLA in Doctoral curricula.
- design specific activities that can be flexible in terms of content to help the student relate it directly to his/her research topic/topics.
- well document and vary materials in all lessons to reach academic literacy, develop the learners' technical jargon, help them make a link between prior knowledge and new knowledge, cover all the group's preferences
- design content-based lessons to develop the learner's academic and scientific English.
- focus on activities that elicit the students' high thinking-levels and make them interactive and supportive.
- apply CALLA to determine students and teachers' responsibilities and fuse them for a more collaborative work.

Conclusion

Doctoral students seem to use many of the strategies that help them achieve their research goals and write academically; however, they sometimes meet time-management difficulties. Correspondingly, Doctoral mentors need to help students plan for action continuously. To this regard, this paper comes to shed light on a number of aspects related to strategy use among Doctoral students before moving to strategy instruction. Students' strategy-use and choice, the existence of metacognition, the extent to which students use and develop their research skills and finally the extent to which students go through the CALLA stages when conducting research represent the highlighted factors.

Preliminary results showed that the CALLA model's phases (preparation, presentation, practice, self-evaluation, expansion, and assessment) are partly used by a wide range of students but not all of them. In addition, content-based instruction related to research can be adjusted using this model to develop their academic and scientific writing. The difficulties Doctoral students encounter are found in the academically and cognitively demanding activities like concept formation, academic productions (written and spoken), understanding written texts related to a technical field, making models, maps, charts and graphs and discussing them. This investigation adds value to cognitive strategies in the research field since many difficulties are revealed. To provide solution for the latter, the CALLA model can be applied and added to Doctoral curricula to structure the students' academic productions.

Although Doctoral students showed a mastery of research skills and use different kinds of strategies during the research process, monitoring them using CALLA's five phases mainly during the two first years of the Doctoral programme is focal as may help them: to prepare, present, practise, self-assess and expand their research skills.

Future research may address the application of the CALLA model with a specific Doctoral programme, the design of activities and the organisation of workshops to pilot the model and its techniques in an Algerian context and with a specific field of research.

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Appendix: The Cognitive and Academic Advanced Language Learning Questionnaire (CAALLQ)

Part 01: Reading Strategies and Written Resources

Q1 Say How do you agree or disagree with the following statements

	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
I have good mastery of basic English writing	<input type="radio"/>				<input type="radio"/>
I have sufficient vocabulary to approach my academic writing tasks	<input type="radio"/>				<input type="radio"/>
I have sufficient mastery of the technical concepts used in my field of interest	<input type="radio"/>				<input type="radio"/>
I can write academic assignments using the appropriate language style	<input type="radio"/>				<input type="radio"/>
I use a plan before assembling my ideas to write any section	<input type="radio"/>				<input type="radio"/>
I always pay attention to organisation in my research	<input type="radio"/>				<input type="radio"/>
I am successful in summarizing my ideas	<input type="radio"/>				<input type="radio"/>
I can easily expand an idea into a full text	<input type="radio"/>				<input type="radio"/>
I can transform any graph or figure into a text	<input type="radio"/>				<input type="radio"/>
I can easily interpret statistical data	<input type="radio"/>				<input type="radio"/>
I can discuss results referring to the resources I used	<input type="radio"/>				<input type="radio"/>
I can easily organise my references	<input type="radio"/>				<input type="radio"/>
I can easily update my annotated bibliography	<input type="radio"/>				<input type="radio"/>
I master the required referencing style by my	<input type="radio"/>				<input type="radio"/>

Part 02: Writing Strategies

Q2 Say How do you agree or disagree with the following statements

	Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
I have good mastery of basic English writing	<input type="radio"/>				<input type="radio"/>
I have sufficient vocabulary to approach my academic writing tasks	<input type="radio"/>				<input type="radio"/>
I have sufficient mastery of the technical concepts used in my field of interest	<input type="radio"/>				<input type="radio"/>
I can write academic assignments using the appropriate language style	<input type="radio"/>				<input type="radio"/>
I use a plan before assembling my ideas to write any section	<input type="radio"/>				<input type="radio"/>
I always pay attention to organisation in my research	<input type="radio"/>				<input type="radio"/>
I am successful in summarizing my ideas	<input type="radio"/>				<input type="radio"/>
I can easily expand an idea into a full text	<input type="radio"/>				<input type="radio"/>
I can transform any graph or figure into a text	<input type="radio"/>				<input type="radio"/>
I can easily interpret statistical data	<input type="radio"/>				<input type="radio"/>
I can discuss results referring to the resources I used	<input type="radio"/>				<input type="radio"/>
I can easily organise my references	<input type="radio"/>				<input type="radio"/>
I can easily update my annotated bibliography	<input type="radio"/>				<input type="radio"/>
I master the required referencing style by my institution	<input type="radio"/>				<input type="radio"/>
It is easy for me to organise my time to approach an academic task	<input type="radio"/>				<input type="radio"/>

Part 03: Instruction Strategies Steps

Q3 Say how appropriate of you is each of the following statements in the process of writing your research paper/thesis

	Very appropriate of me (1)	Appropriate of me (2)	Not applicable (3)	Little appropriate of me (4)	Not at all appropriate of me (5)
I make use of my prior knowledge to get started	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I focus on the strategies I master best to approach current tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I develop the strategies that helped me succeed an academic task	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I read new content carefully	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I take notes when I find new information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I try to make use of new strategies when reading new content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I refer to existing models to present data thoroughly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I always make use of the new learnt content in my writings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I try to develop the learnt content through extensive practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I succeed to be independent while writing new learnt content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I generally leave my first draft for some time and revise it again	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use diverse self-assessment strategies to monitor my writing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can use the same writing strategies in different kinds of tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can combine many writing strategies to resort my own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

writing model

I ask the teacher's help for assessment to evaluate my writing performance

Part 04: Demographic Information

Q1 Your gender

Male (1)

Female (2)

Q2 Age range

24-28 (1)

29-35 (2)

above 35 (3)

Q3 Are you subscribed to the doctorate studies:

Doctorat En-science (1)

Doctorat LMD (2)

Other (3)

Q4 Your main field of interest in your research

Q5 Doctoral subscription:

First year (1)

Second year (2)

Third year (3)

Fourth year (4)

above the fourth year (5)

Q6 What is your University of affiliation as a doctoral student?

Q7 You can add any comment concerning your strategy use when writing your research papers/dissertation:

Appendix 2: Samples from Students' Used Strategies

You can add any comment concerning your strategy use when writing your research papers/dissertation:
I try to stay on track and avoid procrastination. I endeavor to write daily. When I suffer from writer's block, I take a break. It helps recharge my batteries and re-start writing.
when writing an academic section for my chapter i used a table for organizing my notes and link them for syntheses putting a record of the reference.
In the beginning i write a lot , anything that i find related to the topic , then i narrow down and eliminate things gradually by the end of the writing process, keeping just those elements directly involved.
analysing the writing style of some already published PhD theses online
Time management and consistency
brainstorming, analysis,synthesis, notetaking, extensive reading
I write each new item in a paper and start jotting down ideas related to that new word Then I write the possible questions or answers it means for each stage of writing I have bloc notes .drafting copybook where I have written all that is related to literature , editing copybook to modify and classify the ideas with sources and titles according to their related concepts,then I start typing

You can add any comment concerning your strategy use when writing your research papers/dissertation:
Well, writing develops with reading. PhD students have to be so careful when it comes to academic writing, use simple and short sentences, organize our ideas in the form of paragraphs, be careful with referencing to avoid plagiarism, be careful with new concepts we make sure they are defined carefully and that they work for our topic. Most importantly revise our work check our grammar delete repetitive sentences no rosier language do not forget make a link between paragraphs.....
Combination, comparison and analysis of the existing ideas about a specific subject and try to come up with a new original articulation of the idea around the same subject matter. The articulation should come to balance between the different approaches so that to fulfill a kind of consensus. The latter should operate a certain transcendence through taking into account the new challenging realities to which the subject at hand should respond positively and efficiently.
I first start by writing my ideas to in a draft so i can make use of them later, I never start writing directly.
Writing an academic research for me is a great pleasure. I enjoy using different strategies and take my time in revising and proofreading my writing. The only problem I have is time management.

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