The Effects of Language Supportive Pedagogy (LSP) in Students' Writing Skills in the Entomology Course at Kotebe University of Education

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Abstract

This paper reports on small scale action research conducted with students in the final year of their degree at Kotebe University of Education. We found that students majoring in biology expressed their content knowledge in the form of lists and avoided composing coherent sentences - much less complete paragraphs. We designed an intervention that explicitly guided the students to compose short pieces of academic writing within four scientific genres: description, comparison, components and classification. The intervention was evaluated using pretest, posttest and a student focused group discussion involving around one third of the class. The results show that after six weeks, all the students were able to write coherent, well-organized paragraphs using appropriate scientific language. Students attributed their improvement to the formative feedback they received throughout the six-week intervention. This small scale study suggests that cross-curricular language support has considerable potential for developing pre-service teachers' writing skills. However, realizing this potential requires collaboration between language and other subject teachers. We relate the findings to previous research in Tanzania, which focused on developing pre-service teachers' pedagogic skills for supporting learners through language transition. The policy implications of using home language as the medium of instruction in higher education institutions where English is the language of instruction should be considered for science teachers. Moreover, we concluded by arguing for a joined up approach to teacher education for multilingual education systems and suggested some priorities for further research.

Key words*:* Language Supportive Pedagogy, Multilingual Education, Professional Collaboration Science Education

1. Introduction

English Medium Instruction (EMI), as part of basic education in under-resourced and postcolonial education systems, is highly controversial (Milligan & Tikly 2016 cited in Bowden et al, 2022). Research in educational linguistics is now challenging the efficacy of monolingual approaches that often dominate educational practices in multilingual settings. Creese and Blackledge (2010) explain that monolingual instructional practices have dominated language teaching for a long time. As a result, most teachers have developed a monolingual mindset. The classroom pedagogy also reflects a pseudo-immersion exercise that does not ensure grammatical competence and does not ensure development of originality and creative use of English (Boruah, 2015).

Subtractive Multilingual Education (SMLE) models which take away learners' previous language of instruction (L1) and replace with L2 as the Language of Learning and Teaching (LOLT) could be a major contributor for the students' academic achievement. It has been often noted that subtractive transitions undermine the development of students' literacy in their existing languages, and their achievement across the curricula (Bowden & Barrett, 2022; May, 2017; Thomas & Collier, 2002). This indicated that the use of learners' home language in the classroom has the potential to make learners involved in the learning process, increase students' involvement in education and speed up the development of basic literacy. However, there is no a single country in sub-Saharan Africa that uses an African language as the language of instruction at secondary or tertiary level except South Africa's use of Afrikaans in some universities (Brock -Utne, 2015). Large-scale, longitudinal studies repeatedly show the benefits of additive models of multilingual education over subtractive models on language and subject learning (Bowden et al, 2022).

Both early-exit and late-exit which refer to the point at which English language is being used as medium of instruction could also be another factor determining the success of the students. In putting a clear distinction between early-exit and late exist, Bowden and Barrett (2022) stated that Early-exit transitions occurs when an additional European language of instruction is used in the first four years of primary (lower primary) school and late-exit transitions takes place between primary and secondary school, or during the secondary phase. The 'switch' to an additional European language of instruction at an early age or later age is a bone of contention among scholars in the area. Unfortunately, if we consider the models of educational language use in policy and practice in African contexts, the overwhelming majority would be considered early exit transitional

(Benson, 2015). In summarizing the point, Bowden & Barrett (2022) noted that both early and late-exit subtractive models are seen as weak, compared to additive and flexible models which promote the progressive development of two or more languages in the classroom. Considering English as an international language, Rao (2015) suggested that English needs to be learnt well but learnt additively (not subtractively at the expense of the other languages of the learner) and English must remain a part (but only a part) of the country's multilingual ecology.

Many research studies have compared the academic achievement of children studying in MLE and non-MLE schools, and they have found that children in MLE schools performed significantly better than their non-MLE counterparts in curricular areas like mathematics, environmental studies and language (Manocha & Panda, 2015). Furthermore, Seid (2019) found out that L1 based-MLE in Ethiopia increases the likelihood of enrolment in primary school and of attending the right grade for age. In a similar manner, Ramachandran (2017) reported that L1 instruction in the early grades leads to an additional half year of completed schooling and a five percent increased chance of finishing primary school.

This indicated that the switch from mother-tongue to English instruction is a major barrier for students' academic achievement. That is, subtractive policies restrict the ease with which teachers and learners interact and reinforce practices such as rote learning, memorization and copying written texts from the board (Bowden & Barrett; 2022).In addition to this, subtractive MLE (basic education) at tertiary could exacerbate the matter. Furthering the discussion, Bowden and Barrett (2022) argued that subtractive MLE undermines classroom communication. That is, learning in students' mother tongue is also crucial in enhancing communication skills among students population. Students enjoy school more; they tend to have increased self-esteem and they feel more at home when they employ the home language in the classroom discussion.

The poor performance of the students might be due to the impoverished learning environment, and the regrettable language command of teachers. In this regard, Yonas's (2008) subjects kept saying that their [the teachers' deficiency] own deficiency in spoken English prevented them from applying communicative language learning methods in their classroom. Most graduates lack basic communication skills. To worsen matters, students graduated in foreign language (English) were unable to use the language for communication purpose with their students (Yonas, 2008). Sharing the Tanzanian experience, Mtana and O-saki (2015) noted that the English language is poorly

taught in public primary schools (due to a lack of adequately qualified English teachers at that level), while access outside the classroom is almost non-existent. The same experience has been observed in India. Boruah (2015) stated that not all teachers in EMI schools are themselves proficient in English.

The act of calling a dominant language the medium of instruction does not make it a valid language of classroom communication, nor does it miraculously make learners fluent (Benson, 2015). English should not be deemed as a hallmark of excellence, competence, and the benchmark of a genius. The foreign language obsession syndrome would pave the way to overlook the major goals of education. At times, the overwhelming desire for a dominant language like English or French may make them forget about other important goals of education like learning to read and write, developing critical thinking and building knowledge across the curriculum (Benson,2015). After all, the sole motive of language is to communicate, not to subjugate which is a reflection of intellectual backwardness. This shows the inadequacy of many western language learning theories when applied to the African continent and the necessity of working for a paradigm shift in the thinking on bilingual/multilingual education in Africa *(*Brock-Utne, 2015*).*

In view of the above, the use of two or more languages in schooling is valuable in the transition period but it is also widely seen to have general educational value beyond that (Clegg & Simpson, 2016). For example, the dropout rate has fallen as students are more interested to remain in school when their own language is used as a medium of instruction (Kadel, 2015). In addition to this, the use of the students' first language as medium of instruction could promote a smooth transition between home and school. Moreover, when students use their own language, they are able to develop a wealth of oral skills that could have a positive transfer to second/foreign language acquisition.

As a multilingual country, various languages are spoken in Ethiopia. Cognizant of the pedagogical advantage of the child in learning in a mother tongue and the rights of nationalities to promote the use of their languages, primary education is given in nationality languages(MoE, 1994). Since 1994, over 20 languages have been used as mediums of instruction for up to grades 4, 6, or 8 depending on the real conditions in each region (MoE, 2002). That is, local languages in their respective areas are used as medium of instruction from grades 1– 6 or 1-4 and thereafter English takes over up to tertiary level. Despite this, the students' command of English has been extremely

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poor. The standard of competence in English is low among both teachers and students (Bekalu, 2011; Yonas, 2008). Most graduates lack basic English communication skills and the quality of English use among the student population is poor.

The introduction of MLE has been indispensable so as to address the needs of the linguistically and culturally diverse students. MLE has been understood to mean the use of two or more languages as media of instruction in subjects other than the languages themselves (Anderson & Boyer, 1978). But its introduction in Ethiopia has been politicized and it has been considered as the rights of nationalities to promote the use of their languages instead of considering the pedagogical advantage of children in learning in mother tongue. Ethiopia does the best job of using mother tongues to promote literacy and learning, but misses opportunities to use bi- or multilingual methodologies and to maximize the effectiveness of L2 Amharic (Benson, 2010).

English only medium instruction could limit the performance, participation and knowledge production on the part of the students. The national Grade 8 assessment score (from 2000, 2004 and 2008) indicated that students taught and assessed in their L1 for eight years outperformed those taught and assessed in English (L3) (Benson,2015). Furthering the discussion, sharing the experiences from India, Boruah (2015) further noted that classrooms are not conducive to learner-generated language; the culture of the classroom is mainly focused on students listening attentively to the teacher and responding only when asked to; the situation is ritualistic and the pedagogy limits the use of English to question answer routines.

It is the convection of the researchers that classroom transactions need to be hybridized and there is also unrestricted use of non-English languages in the teaching of science subjects. To this end, pedagogical strategies that necessitate language supportive pedagogy, code switching, and trans-languaging should be taken into consideration. Owing to this, this study tries to examine the effects of using more than one language as a medium of instruction in teaching vocabulary and writing in Biology classes. A switch to English as the medium of instruction in secondary and tertiary education could deter students from exploiting their potential and may deny multilingual spaces in their classroom. Owing to this, this study will try to assess the effect of creating multilingual spaces on the performance of biology students on writing tasks. In the Ethiopian context, few studies have been done in the area of language policy but not in the area of multilingual pedagogy. Cohen (2010) questioned the level of equity shown in the process of introducing different languages.

Daniel and Abebayehu (2006) discussed language planning and changing whereas Küspert (2014) analyzed language policy and social identity in the light of socio-political changes in Ethiopia. None of these studies did empirical analysis of the language of instruction in Ethiopia. Therefore this study fills in this research gap.

The general objective of this study is to examine the effects of Language Supportive Pedagogy (LSP) in students' writing skills in the Entomology course at KUE. In light of this general objective, the specific objectives of the study are to:

- ➢ evaluate students' skills for writing within a specific Entomology course;
- ➢ examine the benefits of the intervention in students' writing skill within the specific genre.

2. Methodology

A quasi-experimental design was used as a research design and the sample of the population of the study was third year Biology students at Kotebe University of Education (KUE). One class of students (sixteen in number) was used for the study (pre and post-tests were given). The aim of the study was to examine the effects of the pedagogical strategies that necessitate language supportive pedagogy, code switching, and trans-languaging that support the use of additional language in the classroom in students' writing skills into the Entomology course at KUE. The course 'Entomology', the study of insects, was selected because one of the researchers taught the course 'Entomology' by the time the study was being done. Owing to this, this study tried to examine the effects of using more than one language as a medium of instruction in teaching vocabulary and writing in biology classes.

After introducing LSP, both language teachers and biology teachers planned the teaching session together. During the intervention, the researchers (both English and biology teachers) identified sub-topics for vocabulary learning and subgenre writing for the course Entomology. Next, the pre-test was carried out first; and students were reminded the vocabulary taught in the Entomology course. Later, an English teacher, a member of the research team, taught the planned session. A total of six weeks was used for the intervention classes. The intervention was made in the regular class schedule. The subject matter biology teacher who was a member of the research team briefed the students about the importance of the intervention class for the course he had been teaching.

After six weeks, the post-test was administrated. Both tests were administered to the same group of students (one before the intervention and other after the intervention).

To get further insights, a post session focus group discussion with students and interview with teachers were carried out. For the FGD, the group was heterogeneous; that is, all the subjects had different background in terms of age and gender. Regarding the number of participants in a group, a total of six students took part in the FGD. In the process of data collection, the nature of the intervention class, the advantages of using two languages in the teaching learning process, the skills that students developed during the intervention class and related issues were thoroughly examined. The researchers followed a non-directive style of moderating. We tried to exclude any inhibiting impact and subjects did not refrain themselves from entering into the discussion. Two biology teachers at KUE took part in a semi-structured interview with the researcher. The interviewees were selected based on gender so that a representative sample of participants could be surveyed. In the semi-structured interview, the participants were asked about Language Supportive Pedagogy (LSP) and their experiences in the teaching of biology. The interview was used to triangulate the data. The interview was audio recorded and transcribed. Again the interview was carried out in Amharic.

Data collected from respondents through pre- and post- tests, interview and FGD were processed thoroughly to check for completeness, accuracy and uniformity of the gathered data. For the pre- and post-test analysis, the analytical framework for genre analysis was adopted from (Polias, 2016). Both pre-test and posttest assessments were conducted so as to evaluate genre-writing skills. The contents of the lesson were Entomology course and students were assessed for each genre (description, comparison, components and classification).

For the purpose of the analysis, the achievement of the students was grouped into three (high, medium, low achievers). These students' writings were assessed in terms of grammar and course-specific vocabulary. These students were evaluated for each genre (one paragraph for each genre) and the results of the tests were marked based on marking rubric for genre writing. Ethical research protocol was followed and all the participants willingly took part in the study. Students were told that their names would be masked from the analysis and from the data by assigning pseudonyms.
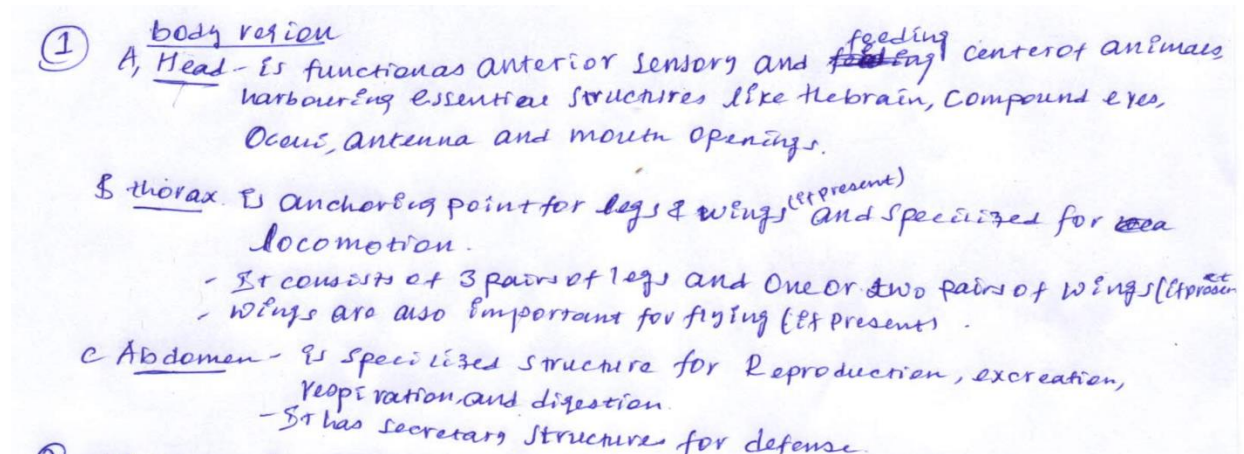
3. Results and Discussion

Findings from the pre- and post- tests

As it can be seen from the students' writings given below, students showed a lot of improvements in their writings. As a representative sample, let us examine the pre- and the post- tests results of the students.
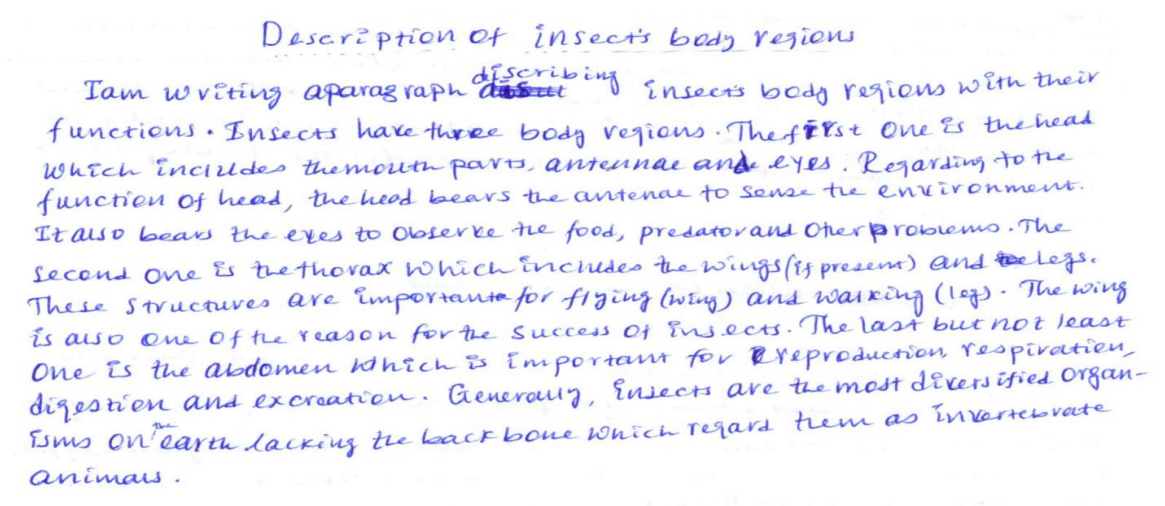
Genre type-Description

Pre-test /top-level student/

Genre type-Description

Post-test/top-level student/

Genre type-Comparison

Pre-test/average-level student/

② Filiform is linear, slender while geniculate is elbowed. Their similarity is both are consists of basal scape
- pedicel
- flagerated

Genre type-Comparison

Post-test/average-level student/

2. Comparision of insects antennae

I am writing a paragraph comparing the filiform and geniculate antennae. Geniculate antennae is a bent like an elbow shape. It is used for sense of smell. The bees and ants are the best example of Geniculate antennae. Similarly, filiform antennae is a type of antennae having a thread like structure with many segments. Filiform antennae is used to guide the entry of pollen tube. The cockroaches are the one the best example of filiform antennae. Generally, insects have which is different type of antennae with different shape and with their different importance.

Genre type-Classification

Pre-test/low-level student/

(4) head oryntation deviding into three

① hypognathouse Mouth part is Ventral in continous with legs is probably primitive example grass hoper

2. Prognathouse Mouth part is antyrior posetion & point forward & found predaceous

Opistognathouse. Sucing Mouth part legs extending for ~~mode~~ back in front legs

Genre type-Classification

Post-test/low-level student/

Insect head classification

I am writing a paragraph on the insects head classification. Insects have three types of head. The first is Hypognathus. It is below jaw. for example grass hopper. The second is prognathus, it is infront of jaw. for example beetles. The last is opistognatus. It is behind jaw. For example bugs head is nation doeses. Generally, Insects head bears the eyes, antanae and the mouth parts.

As indicated in the sample descriptions above, there is an enormous difference between the pretest and the posttest results of the students. In the pretest assessment, students produced discrete phrases and words that did not really describe the aim of the piece of writing. However, in the posttest assessment, students were able to produce organized ideas presented in a form of a paragraph. This finding was corroborated with the findings of the qualitative data. Both the FGD and the interview were good testaments. The following representative excerpts exemplify this issue further.

Haimanot in the FGD has addressed the following points

> *Before this section, I did not know the rules to write a paragraph; so, my paragraph writing skill was poor. But now, I know the steps to write a good paragraph like topic sentences, developer statement and a conclusion sentence that summarizes the topic. I have a good skill on how to write a paragraph that are organized, coherent, and are all related to a single topic.*

Alem in the FGD session noted:

> *The intervention class has helped us a lot in developing our writing skill. We developed a good understating on how to use organized ideas in a paragraph form.*

Similarly, Dawit has the following to say:

> *We usually write phrases or issues by using dot, not in a sentence form. We did not have such type of lesson before. Within a short period of time, we developed a solid understanding on how a paragraph is being organized and written.*

As per the data above, students showed progress in their writing. The reasonable explanation for students producing such paragraphs could be the nature of the strategies that the teacher used. In the teaching-learning process, the teacher embraced more flexible language use. That is, during the intervention class, students and the teacher communicated by switching between English and Amharic and this could enable students to understand the contents of the lesson. Regarding the importance of creating multilingual space in the classroom, Melkamu, in the FGD, has noted the points below:

> *Using home language (Amharic) together with English helped me to develop conceptual understanding and basic learning skills and in short, it leads to a better educational outcome. In addition, I believe teachers may also address the lesson and teach more*

> *effectively when they use native language to elaborate some new concepts. We like classes where we use both languages since those classes are more interactive.*

Furthermore, Belay participating in the FGD has addressed the points below:

> *In the intervention class, we easily understood the lesson when the teacher used our home language. But there are some teachers who do not use Amharic and we do not understand the concept.*

In a similar manner, Roman, a teacher, who took part in the interview, has addressed the points below:

> *I believe using local language especially when introducing a new concepts and vocabulary to students is important. Because I have to make sure that they understand what the new topic is dealing about. In addition it may help them to associate the new lesson with their already existing knowledge.*

As shown in the data above, the reason for the students' progress has been attributed to the strategies used by the teacher. This further indicated that multilingual strategies seemed to have immense potential for the academic progress of the students. These studies, among others, suggest a need for opening up multilingual spaces in classrooms for epistemic access and effective learning (Kiramba, 2018). That is, teachers who can support students to learn the contents of the lesson need to create multilingual spaces in the classrooms. Sharing the experience of India, Rao (2015) noted that English-medium teaching makes learning difficult for most Indian students and a mother-tongue medium education facilitates learning.

It was learnt that only-English medium instruction could silence students' engagement in learning. Sara, a teacher who participated in the interview session addressed the following point:

> *In most of my classes I have observed that most students hold back from engaging in classroom discussions if they are not able to transfer such knowledge into the language of instruction.*

In relation to this, Hanna during the FGD noted the points below:

> *We do not participate and listen attentively when the lesson is delivered totally in English because there are a lot of new vocabularies. Thus, I believe it is a good approach to*

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> *translate those words to local language because this approach helps us to understand the contents of the lesson without difficulty and develops our listening skill.*

As it can be seen from the responses of Sara and Hanna, using English as a medium of instruction could limit student participation in the classroom and this further restricts knowledge production. Children learn by participating in activities but it is difficult for a student to participate in classroom discourse until and unless he/she understands and relates to the concepts embedded in the discourse (Manocha & Panda, 2015). The dialogic nature of the classroom discourses, use of children's language and examples from everyday life created an inter-subjective space for discussions on the topic under consideration (Durairajan, 2015). The plausible explanation for students not participating in the classroom discussion could be the language barrier. That is, the teaching learning process does not use the children's linguistic resources and knowledge. Owing to this, a large number of disadvantaged children, whose parents aspire for a better future for their children through the emancipatory effects of education in English, end up with poor English and low academic competence (Mohanty, 2015).

Learning achievement has increased as students are able to openly share their ideas with their teachers and their classmates when using additional language as a medium of instruction (Kadel, 2015). Teaching the student in his/her mother tongue facilitates better comprehension and helps the student to relate to the classroom discourse. In other words, English only environment which may impact learning may not help students to conceptualize what the science teacher teaches. Thus, in some cases, it is important to use either code switching or language supportive pedagogy which is a classroom strategy that supports the learning of content through an additional language (Bowden & Barrett, 2022).

In view of the above, it is a good idea to take an in-depth look at the advantages of using home language in the classroom when necessary; this is because, only-English medium instruction has resulted in a high failure rate of the students. Thus, teachers can be encouraged to use the first language to tap existing capability, this is because the first language can also be used as the language of thinking and reflection for planning and organizing what needs to be said or written in English (Durairajan, 2015). The use of the students' home language as medium of instruction could make students involved in the learning process and it speeds up learning, innovation and creativity.

4. Conclusion

This article reports on small scale action research conducted with students in the final year of their degree at Kotebe University of Education. We found that students majoring in biology produced paragraphs in the form of lists and avoided composing coherent sentences: much less complete paragraphs. We designed an intervention that explicitly guided the students to compose short pieces of academic writing within four scientific genres: description, comparison, components and classification. The intervention was evaluated using pre- and post-tests, focus group discussion and interview. The results show that after six weeks, all the students were able to write coherent, well-organized paragraphs using appropriate scientific language. Students attributed their improvement to the formative feedbacks they had received throughout the six-week intervention. As the findings reveal, there was a marked difference in students' writing in the pretest and posttest results. That is, giving bilingual space in the classroom during discussions favored student. This further indicated that the use of Language Supportive Pedagogy (LSP) for science student teachers is very important to strengthen the mastery of the subject content. This implied that bilingual classroom instructions may potentially support students' understanding of the subject content by fostering classroom interactions.

5. Implications

English only environment may not help students conceptualize the fundamental contents of the science subject that the science teachers teach. Thus, the use of the students' home language as medium of instruction through code switching or language supportive pedagogy could make students involved in the learning process and it speeds up learning, innovation and creativity. The policy implications of using home language as the medium of instruction in HEIs where English is the language of instruction should be considered for science teachers.

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Authors' contribution

All authors contributed equally.

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