

# **Integrating Project-Based Learning in an English for Academic Purposes Course: A Case Study of Thai Medical Students**

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## **Abstract**

This current quasi-experimental classroom research was designed to investigate the effects of integrating project-based learning (PBL) in an English for academic purposes (EAP) course in the following areas: reading proficiency, knowledge of academic vocabulary, nature and characteristics of students' projects, and students' attitudes and motivation. The participants of the study were 61 second year medical students enrolled in an EAP course at Naresuan University, Phitsanulok, Thailand, in the second semester of the academic year 2007. Throughout the learning and teaching processes, the students attended the in-class lectures and worked outside class on a self-selected project related to their field of study. The findings of the research showed an increase in both students' reading proficiency, and knowledge of academic vocabulary. An analysis of the students' report projects based on data collection techniques and sources of information revealed variability not only in their nature but also in their characteristics. It was also found that nearly all the students had positive attitudes and learning motivation towards the integration of project-based learning.

*Keywords: project-based learning; English for academic purposes; medical students*

## **บทคัดย่อ**

งานวิจัยนี้เป็นงานวิจัยกึ่งทดลองในชั้นเรียนซึ่งมีวัตถุประสงค์เพื่อศึกษาผลของนำแนวคิดของการทำโครงการมานบูรณาการในการเรียนการสอนรายวิชาภาษาอังกฤษเชิงวิชาการในประเด็น

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ของสมิทธิภาพในการอ่าน ความรู้เกี่ยวกับคำศัพท์ในเชิงวิชาการ ลักษณะโครงงานของนิสิต ทัศนคติและแรงจูงใจในการเรียน กลุ่มตัวอย่างที่ใช้ในการศึกษาเป็นนิสิตคณะแพทยศาสตร์ ชั้นปีที่ 2 ของมหาวิทยาลัยนเรศวร จำนวน 61 คนที่ลงทะเบียนเรียนในรายวิชาภาษาอังกฤษเชิง วิชาการในภาคปลาย ปีการศึกษา 2550 กระบวนการเรียนการสอนนอกจากการเข้าฟังบรรยายใน ชั้นเรียนแล้ว นิสิตจะต้องดำเนินการทำโครงงานนอกเวลาเรียนในหัวข้อที่นิสิตมีความสนใจและ เกี่ยวข้องกับสาขาที่นิสิตกำลังศึกษา ผลการวิจัยพบว่าสมิทธิภาพในการอ่าน และความรู้เกี่ยวกับ คำศัพท์ในเชิงวิชาการของนิสิตเพิ่มขึ้น การวิเคราะห์ผลผลิตของโครงงานตามวิธีการเก็บรวบรวม ข้อมูล และแหล่งที่มาของข้อมูลพบความหลากหลายในลักษณะของโครงงาน และพบว่านิสิตเกือบ ทั้งหมดมีทัศนคติและแรงจูงใจที่ดีต่อกระบวนการเรียนการสอนโดยการบูรณาการโครงงาน

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## Introduction

In keeping with globalization, knowledge of English language skills, specifically reading, seems to be the most needed skill among Thai EFL students. Swalm and Kling (1973 cited in Browning, 2003) point out that reading is a language skill that is now in more demand than at any time in history. With exposure to the internet in a global arena, students need to master reading in order to understand the vast knowledge the world embraces. This fact places pressure on the students to perform at a higher level than the students before them.

At Naresuan University, all freshmen are required to take two English fundamental courses, Fundamental English (001111) and Developmental English (001112), which focus on developing basic communication skills, namely listening, speaking, reading, and writing. As the ability to read academic texts is considered one of the most important skills that EFL students at tertiary level need to acquire, the university offers an elective English course for those who are interested in improving this particular skill, that is, English for academic purposes (001113). The objectives of the course as delineated in the course description are as follows:

“Development of English skills with an emphasis on reading and writing pertaining to students’ academic areas and their research interests” (Naresuan University, 2007).

From the aforementioned, it is apparent that the course instructor needs an appropriate instructional method that seems to work well with the imparting of language content and at the same time provide students with the opportunities to do research on a topic related to their field of study. Thus, project-based learning may be an ideal approach for the course. PBL

as defined by Stoller (1997) is a versatile vehicle for integrated language and content learning, and it is applicable to language teachers working in a variety of settings from general English, English for academic purposes (EAP), English for specific purposes (ESP), and even to teacher training. It has the potential to provide foreign language learners with essential conditions for language learning (Willis, 1996; Moss & Van Duzer, 1998). The authenticity of experience in PBL helps improve language and content knowledge, increase metacognitive awareness as well as motivation and engagement, enhance critical thinking and decision-making abilities, create a cooperative work atmosphere, and familiarize students with target language resources (Stoller, 1997; Alan & Stoller, 2005).

This classroom research, therefore, aimed to examine the effects of integrating project-based learning in an EAP course in terms of students' reading proficiency, academic vocabulary knowledge, nature and characteristics of students' projects, students' attitudes and learning motivation towards the integration of PBL.

## **Literature review**

Since it was first acknowledged in the 19<sup>th</sup> century, the project approach has been implemented in a wide variety of educational contexts ranging from early childhood education to medical and legal education (Stites, 1998). In foreign language education, PBL was introduced into the field two decades ago as a way to reflect the principles of student-centered teaching (Hedge, 1993 cited in Beckett & Miller, 2006). As a result of the development of PBL, numerous language educators now incorporate it into their classrooms.

However, only a small amount of research about PBL has been conducted in the field of second and foreign language education. A review of the available current research literature reveals that much of the research has been carried out at secondary and tertiary education (Beckett, 1999; Catrina, 2000 cited in Sudrung, 2004; Wu, 2001; Kanaoka, 2005; Beckett & Slater, 2005; Sidman-Taveau, 2006; Finch, 2007; and Ilieva, 2008), and variables like language proficiency, language learning strategies, attitudes towards learning, self-confidence, motivation, and work environments have been investigated. Most of the studies yielded positive support for PBL, except the one done by Beckett (1999) in which students evaluated PBL negatively.

In Thailand, studies on the impacts of PBL have been found at all levels of education; nevertheless, they are still limited. Examples are Suriya

(2000), Sukhamilinda (2001), Termprayoon (2002), Sudrung (2004), Kuadnok (2005), Kanthila (2005), and Moonsarn (2006). These research projects verified the effectiveness of the approach with primary and secondary school students. The results, regarding language proficiency and other related skills, pointed to the success of PBL. In contrast, only two studies to date have been found at the tertiary level (Annas, 2002; Maneekhao, 2003 cited in Sudrung, 2004); the former implemented PBL in an ESP class, and the latter focused on how students used the internet in a project-based course.

It is clear that further research on the outcomes of PBL in the Thai EFL context, particularly in higher education, needs to be done in order to get insight into several dimensions of the approach.

## **Research questions**

The following specific research questions were addressed in the present study:

1. Does the integration of project-based learning in a course significantly help students improve their reading proficiency?
2. Does the integration of project-based learning in a course significantly help students increase their knowledge of academic vocabulary?
3. What are the nature and characteristics of students' projects?
4. How does the integration of project-based learning in a course affect students' attitudes and learning motivation?

## **Method**

One year prior to this experiment, the researcher had piloted the project approach with 65 pharmaceutical science students with the purpose of getting students' feedback on their attitudes towards the approach and the course. Results of that pilot project were positive. Students reported that they really liked doing the project as they not only had a chance to practice their language skills but also learned how to work collaboratively with their peers. The researcher as the course instructor was amazed to observe the students' work processes and their performance on the final presentation. Thus, the researcher became more confident that the approach matches well with the course.

In the present experiment, the researcher, with more careful thought gained from the trial period, improved the course structure by changing some of the language content and class activities to suit the students' needs and interests. The researcher taught the students for 16 weeks (3 hours/week). Throughout the learning and teaching procedures, students were required to attend the in-class lectures for language input on such topics as guessing word meaning, analyzing word parts, paraphrasing, summarizing, note-taking, understanding graphics, etc. which was relevant to the information and language needs of the project, and they followed the three phases of project work adapted from Wrigley (1998) while working in a small group of 5-6 on the self-selected project outside class (as shown in table 1).

**Table 1: In-class and out-of-class activities for a project-based classroom**

In-class activities	Out -of -class activities
Week 1-2 - Course orientation - Introduction to project work - In-class lectures	<b>Selecting a topic</b> - Finding group partners - Choosing a project topic - Writing a project outline - Preparing for an oral presentation
Week 3 - Presenting a project outline (Teacher helps shape a project)	<b>Carrying out a project</b> - Planning for data collection - Collating information - Analyzing the information - Writing a final project report - Preparing for an oral presentation  (Groups regularly consult with the teacher)
Week 4-8 - In-class lectures	
Week 9 - Reporting progress on the project	
Week 10-14 - In-class lectures	
Week 15-16 <b>Sharing results with others</b> - Doing an oral presentation - Submitting a project report	- Wrap up group interview

The detailed description of activities undertaken during the three phases of project work is as follows;

### **Selecting a topic**

After the introduction of project work in class in the first week, students had to work outside class to form a group of 5-6 people. They had to choose a project topic related to their field of study which they were all interested in. In the next two weeks they had to prepare for the oral presentation of the project draft by answering questions like: What is the theme of the project? Why are you interested in doing this project? What are the sub-themes you would like to deal with? What will your group do? Who will do what? How will you do it? When do you plan to finish your project? What will your final presentation be? What are examples of your references? The teacher helped them shape the projects by giving comments and suggestions.

### **Carrying out a project**

Once the topic had been selected and the plan had been set, students started doing their projects for 10 weeks outside the classroom. During these weeks they had to report their progress to the class, and this enabled the teacher to evaluate whether they could accomplish the task within the time limit. While they were working, problems concerning the projects could be discussed with the teacher as she was available as a resource person for all content and language-related matters. Students were also notified of the submission of a project report and the final oral presentation which were scheduled two weeks before the semester ended. Students were allowed to design their own presentations, and the teacher did not interfere with any creative ideas.

### **Sharing results with others**

At this final step, the project results were shared through an English oral presentation. Each individual group had 20 minutes for the presentation, and 5 minutes were reserved for a Q&A session. The questions might either come from the teacher or the students. After that, the groups submitted a project report to the teacher.

## **Participants**

Sixty-one sophomore medical students enrolled in the course 001113 English for academic purposes (EAP) in the second semester of the academic year 2007 participated in the study. All of the students have been studying English for at least eight years and are considered high beginners to high intermediate according to their English scores on the nationwide entrance examination.

## **Research instruments**

In order to investigate the effects of the integration of PBL in various dimensions as specified earlier, this study employed both qualitative and quantitative methods for data gathering. To fulfill those purposes, 4 types of research instruments were employed:

### **Reading proficiency test**

The reading parts of the two practice TOEFL tests used in Rogers (1998) were adapted to evaluate the students' reading proficiency. The test contained 3 passages with 30 multiple-choice items. Following each passage, there were 10 comprehension questions of 3 question types: vocabulary questions, factual or detailed questions, and inference questions. The same test paper was administered to the students before and after the experiment to assure an exactly comparable test, thus avoiding the problem of equating different forms of test. The allotted time for the test was 40 minutes.

### **Academic vocabulary knowledge test**

A test of academic vocabulary knowledge constructed by the researcher was used before and after the project work. The test comprised 120 academic words randomly selected from the 10 sublist word families compiled by Coxhead (2000). Within 30 minutes, the students were asked to check whether they knew the actual meaning of the words on a list, then they had to write their meanings either in Thai or in English. Due to the fact that these words were presented without contexts, all possible meanings were accepted.

### **Semi-structured interview**

At the end of the semester each group of the students was given a 30 minute interview to evaluate their attitudes and learning motivation towards PBL. This interview provided the researcher with in-depth information for the interpretation of the students' opinions and attitudes. Samples of questions used were: How were you involved in the project? Is it your first experience of project work? How would you rate your project? Why do you think it deserves such a rating? What skills and strategies have you mastered to conduct the project? What were your problems? How did you solve the problems? What is your overall impression of the project?, etc.

### **Teacher's notes**

After each class the researcher as the course lecturer regularly wrote her notes on particular issues found through her observation of class atmosphere, students' behaviors and their participation, either with their peers or the teacher, and students' performance on the oral presentation.

## **Results**

The quantitative data derived from the pre- and post-tests of reading proficiency and academic vocabulary knowledge were analyzed by calculating the means, and standard deviation. Moreover, in order to test the differences between those scores, a dependent t-test was conducted to answer the first two research questions of the study. In addition, qualitative data collected from the interviews, and the teacher's notes were analyzed and grouped into categories to bring together similar or distinct ideas on attitudes and learning motivation. The results of the research are presented below:

### **1. Does the integration of project-based learning in a course significantly help students improve their reading proficiency?**

As can be seen from Table 2, the students' reading scores increased from 11.97 for the pre-test to 14.41 for the post-test. In order to see whether the difference existing between the means obtained from the pre-test and post-test scores was statistically significant, a dependent t-test was calculated with the level of significance set at  $p < .05$ . The results from the analysis revealed that the difference between the means of the pre-test and post-test

reading scores was significant:  $t = 4.66$ . Thus, in answer to the first research question, this suggests that the integration of PBL in a course does enhance medical students' reading proficiency.

**Table 2: A comparison between students' pre-test and post-test scores on reading proficiency**

	Min	Max	$\bar{X}$	SD	t	Sig (2-tailed)
Pre-test	5	19	11.97	3.43	4.66*	0.0000
Post-test	5	21	14.41	3.46		

Total = 30, \*  $p < .05$

## 2. Does the integration of project-based learning in a course significantly help students increase their knowledge of academic vocabulary?

According to the table, the mean scores of the students' academic vocabulary knowledge for the post-test were higher than those for the pre-test (53.03 and 62.82 respectively). The analysis of a dependent t-test revealed that the pre- and post-tests scores were statistically different at .05 level of significance. ( $t = 7.27$ )

**Table 3: A comparison between students' pre-test and post-test scores on knowledge of academic vocabulary**

	Min	Max	$\bar{X}$	SD	t	Sig (2-tailed)
Pre-test	12	92	53.03	20.20	7.27*	0.0000
Post-test	19	103	62.82	19.42		

Total = 120, \*  $p < .05$

## 3. What are the nature and characteristics of students' projects?

At the end of the course, 11 project reports were submitted. These projects were classified according to data collection techniques and sources of information into 4 main categories:

### **Survey research project**

There were 6 projects in this group. The project topics were: skin care products, instant noodles, mobile phone syndrome, calorie lovers, soft drinks: soft or not, and white in black. All of these projects employed both qualitative and quantitative methods for data gathering. The instruments used were questionnaires which were either constructed by the student researchers or adapted from the previously used ones, and interviews. The data were analyzed by means of percentage and content analysis.

### **Experimental research project**

Only one research project was found in this group; it was done on the topic of music therapy. The project aimed to investigate the impact of music on their classmates' emotions. The experiment was carried out for 8 weeks. Two times a week for 15-20 minutes, the group played classical music during the class intermission period to their friends. The instruments used for data collecting were a questionnaire on emotions, and an interview. Percentage and content analysis were used for data analysis.

### **Documentary research project**

Breast implants, blood donations, and the XXX file were the 3 topics in this group. In these studies, besides getting information from available documents, i.e. books, journals, magazines, and the internet, the students also interviewed doctors (the course lecturers in their major field) in order to get in-depth information. Moreover, students in the blood donations project took a visit to the blood bank at the university hospital, videotaped their conversation with the staff, and even donated their blood.

### **Training program**

Only one project was found to belong to this group: the "Meditation" program. The program which was held on Thursdays for 8 weeks provided several meditation activities such as, releasing birds and fish, offering food to monks, practicing meditation etc. to all those interested. The students evaluated the success of the program by recording the number of participants which included both students and lecturers in the faculty of medicine, and the participants' attitudes towards the program concerning its activities and usefulness.

#### **4. How does the integration of project-based learning in a course affect students' attitudes and learning motivation?**

Based on content analysis from the interviews with the students, the teacher's notes on class atmosphere, the students' behaviors and their participation, either with the teacher or friends throughout the learning and teaching procedures, and the students' performance on the oral presentation, the following issues arose which reflected the students' attitudes and learning motivation.

4.1. Students were more motivated to study because what they had learned in class was related to what they had to do outside, e.g. students were trained in various reading skills and strategies in class, and in doing the project outside the class they applied the language to accomplish tasks like reading articles, paraphrasing and summarizing texts, preparing and presenting information through graphics, etc. That is to say, project work helped ease the transition from learning reading skills and strategies within the confines of the classroom to reading under authentic circumstances. Thus, this made the lesson meaningful, and in turn raised the students' motivation to study.

4.2. Students had improved study skills, working skills, and interpersonal skills. As they put their time and effort into trying to accomplish their work, they also became closer to their classmates. Here are some of their reflections:

*S1: Before that, I had few friends, and I didn't really have time to enjoy myself with them. After class, everybody wanted to go home to do personal study. From doing the project, I got more friends and we got closer as we had to meet once or twice a week to discuss the project.*

*S2: When we have problems, we discuss them together to find a way out. Sometimes we have to vote, if we can't come to a conclusion.*

*S3: When I don't understand any part of the text, my friend will help or translate it for me.*

4.3. PBL allowed students to demonstrate their potential skills, abilities, and responsibilities; for example, language skills, computer skills, managerial skills, and creative and critical thinking. These were clearly seen during the

oral presentations, representing the final outcomes of the class project. The students' styles and structures of the presentations were varied, and multiple techniques, including PowerPoint, role play, imitating a TV program, videotapes, and demonstrations were employed to make them more interesting. The information obtained from the students was:

- S1: I didn't know how to videotape, I got trained by my friend.*
- S2: We rehearsed many times before the actual presentation. At first I was quite nervous, but later I could cope with it.*
- S3: The role of each person on the project depends on his/her skills but overall we have to help one another.*
- S4: Sometimes we had problems on the discrepancy of the information we've got. What we did to solve the problem is that we compared the information in terms of the credibility of the sources, the amount of information, or asked the experts (our lecturers).*

4.4. Nearly all of the students felt relaxed and enjoyed themselves while working on the project, only a few viewed it differently. Here is what they said:

- S1: I had a good time distributing the questionnaires in the main canteen because I met and talked to many students.*
- S2: I think the project was quite hard for me. It was time consuming. I wanted to concentrate on my major studies.*
- S3: The experience I got from this course is different. I've never done anything like this before. It's very interesting and challenging.*
- S4: I've gained confidence with my speaking skills, though I had to work hard.*

4.5. Students had learned how to use various sources of knowledge. Other than common resources such as, the internet, books, journals, and magazines, students also made use of resource people: friends, senior students, lecturers, and professional people. For instance, the researcher was impressed at the presentation of the group which conducted the project on "Mobile Phone Syndrome". The students pointed out the pros and cons of the issue from many research findings in a very interesting way. So, in the interview

after the presentation, the researcher found out how this was done. Here is the conversation:

*R: You had quite an interesting way of presenting your work, and it seemed to me that you've read many research articles. How did you come up with such an idea?*

*S1: From an interview on the issue with our lecturer, he suggested to us how to access the information, and how to present it. But reading research articles is quite hard for us.*

Another interesting example came from the presentation of the group which conducted a project on "Skin Care Products". The group had videotaped English interviews with many people.

*R: From your presentation, you interviewed many people like medical students, and lecturers in pharmaceutical science from other universities. How did you contact them?*

*S: The students are our seniors and one of the lecturers is my relative. She's teaching at Srinakarinwirot University.*

In general, it can be concluded that nearly all the students had positive attitudes towards PBL, and it motivated them to study. The researcher as the course instructor felt that it was not only the students who benefited from doing project work, but also the teacher as it developed her understanding of this teaching approach, and broadened her world knowledge about medical related issues. Furthermore, the most rewarding facet of PBL was that it enabled the teacher to look deeper into the students' abilities, other than their learning achievement.

## **Conclusion and discussion**

This present study explored one of the various dimensions in the implementation of PBL in an EFL classroom which was somewhat different from previous studies. Here PBL, though applied in its full scale for the whole semester, was integrated into the conventional classroom where reading skills and strategies were still the course focus. The findings of the research can be summarized as follows:

Concerning research question one, it was found that the students' reading proficiency improved significantly from the pre- to the post-tests. These results correspond to research previously conducted by Beckett (1999), Catrina (2000 cited in Sudrung, 2004), Kanaoka (2005), Sidman-Taveau (2006), Finch (2007), Ilieva (2008), Sukhamilinda (2001), Termprayoon (2002), Sudrung (2004), Kuadnok (2005), Kanthila (2005), and Moonsarn (2006) which yielded unanimous results concerning the students' improvement in their learning. For this current study, it may be due to the in-class lectures which students received on reading skills and strategies, which they then applied to those language elements in their project work. The findings may provide support for the claim that the integration of PBL in a course contributes to the students' reading proficiency.

With reference to research question two, it was found that the learning and teaching procedures with the integration of PBL increased students' knowledge of academic vocabulary. The finding is quite remarkable as vocabulary is a variable that has never been explored in PBL. Such a result may come from the in-house reading material used in class which is designed especially for medical science students. It is a collection of academic excerpts, and articles from disparate sources suitable for the practice of reading skills and strategies, and at the same time it also provides students with a large amount of academic vocabulary. In addition, the projects are in the field of the students' major, so their work required them to read academic texts which offer further academic vocabulary. As a result, it is not surprising that the student's knowledge of academic vocabulary increased significantly.

From an analysis of the students' projects (research question three), it was found that there were 4 categories of projects, which were varied both in nature and characteristics. However, what these projects have in common is that they are all more or less relevant to the students' field of study. It is definitely clear that the students' group project is a result of collaborative efforts among group members, starting from the first step of selecting a topic, proceeding with collaborative exploration, to the last step of sharing the results. All of these activities have been carried out without the teacher's interference, as her role is that of a guide or a facilitator (Wrigley, 1998). From the researcher's point of view, these working processes represent the

concept of “students’ autonomy” which many educators (e.g. Dhieb-Henia, 1999; Buck Institute for Education, 2007; Alan & Stoller, 2005) view as one of the critical attributes of PBL. Moreover, these steps play a role in developing the students’ sense of ownership towards the project. In working as a group, students’ bring most of their potential (e.g. language ability, content knowledge, creative ideas, critical thinking, etc.) to strengthen the work of the team. This certainly leads to project uniqueness.

As for the last research question concerning students’ attitudes and motivation, the results showed that nearly all the students had positive attitudes and learning motivation towards PBL. These results are also consistent with those of previous studies (Annas, 2002; Termprayoon, 2002; Sudrung, 2004; Kanaoka, 2005; Beckett & Slater, 2005; Sidman-Taveau, 2006; and Finch, 2007). From the researcher’s viewpoint, the findings may result from three reasons. One possible reason can be explained by the students’ experience of PBL. As most of them reported that it was their first time doing English project work, and it required them to do something different from what traditional classes did. They seemed to be relaxed while working on the project, and enjoyed various experiences that the project offered. The second reason may come from the work atmosphere. The students enjoyed working in groups and doing cooperative work, for they felt comfortable and secure in the team as they chose the groups themselves. The last reason may result from the authenticity of the project tasks. The tasks such as searching for information, reading and summarizing the texts, preparing and doing an oral presentation provide students with hands-on experience, and they are in line with what students will encounter in their future academic and professional life. All of these factors lend support to a meaningful English classroom, and bring students’ interests and motivation towards the integration of PBL.

## **Implications**

The purposes of this study were to investigate the impact of integrating PBL in an EAP course with regard to reading proficiency, knowledge of academic vocabulary, nature and characteristics of students’ projects, as well as students’ attitudes and learning motivation. The findings are very supportive

for the benefits of integrating PBL into a language classroom. As one can see, PBL provides a vibrant environment for English language classrooms and thus it may serve as an alternative way of teaching which is worth trying and experiencing. Due to the flexibility of the approach which depends on contextual factors, learning objectives, and available resources, those who are interested can implement it in various ways. Language teachers in traditional classrooms may diversify their instruction with a mini project that lasts only a class session, or integrate it in their courses to provide students with hands-on experience like this current study. And in order to maximize the benefits of PBL, it is recommended that teachers employ a full-scale project (without class lectures) by engaging students in project work for an entire semester. To whatever degree or extent teachers use the project approach, it can be rewarding for teachers and students alike.

## Suggestions for future research

From an extensive review of the research on PBL, it is clearly seen that the effects and support for using PBL in the field of foreign language education in Thailand still needs more evidence. Hence, investigations should be further continued at all levels of education, in different contexts, and with several variables to explore. More importantly, the benefits of using PBL in comparison with other language teaching methods should be promoted.

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