

The Evaluation of EAP Science New Materials

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Introduction

English for Academic Purposes (Science), or EAP Science, is a compulsory course for 3rd year Science undergraduates at Chulalongkorn University, Bangkok, Thailand. Our aim with the course was to design an effective skills-based course which appealed to students through contemporary content and a variety of student centred learning techniques. In addition to this, we were looking to a course which would be accessible as a group of self study modules to students of all science oriented faculties, and also other universities outside Chulalongkorn.

To achieve this, a variety of up-to-date articles from a wide range of sources, some modified or specially written, and some original texts, were used to formulate both paper-based and also internet/CDRom based teaching materials. Detailed teachers' books and supplements were produced to assist instructors and suggest alternative methods of using the materials and tailoring them to students' needs and abilities.

Here we present an overview of the motivations and methodologies behind the creation of the course and reactions to it (1), followed by more detailed evaluation and analysis based on students' and teachers'

responses having taught the course over the second semester of 2001 (2).

1. Overview of the motivations and methodologies behind the creation of the course and reactions to it

One problem of instructors in countries where English is taught as a foreign language is the appropriacy of the materials used in class and their content. Modern contents seem to hold more interest for the students, and, as a result, whatever content is used in teaching, it needs to be continuously updated. In other words, the novelty of the contents is one appealing factor regarding learners' attitude towards the language itself. A commonly held view in language teaching is that the best way to find suitable materials is for instructors to develop ones themselves, since they know both their students and the course objectives.

According to Brian Tomlinson (1998), "Materials development refers to anything which is done by writers, teachers or learners to provide sources of language input and to exploit those sources in ways which maximize the likelihood of intake; in other words, the supplying of information about and/ or experience of the language in

ways designed to promote language learning” (p.119).

Based on the same belief, the latest EAP Science materials have been developed to facilitate the study of English as well as to enable third year Science students to study and learn English which can really be used later to pursue their future study and career.

Material Development

The materials’ design objectives are, in short, to enable students to read scientific texts and articles and to help them be able to organise their ideas into written forms either through outlining or summarising. The course ends with an oral presentation and mini-scientific reports. The purpose is just to let students have a chance to practise speaking in front of the class to a friendly

Reading Skills

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Kevin Dempsey

Describing non-visual information:

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Assistant Professor Dr. Panchalee Wasanasomsit

Describing Process:

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Oral Presentations

Kevin Dempsey

Editors:

Iain Moore and Kevin Dempsey

In Book I, the purpose is to familiarise students with the method and style of both skills to develop the necessary confidence to put those skills into practice in Book II.

One beneficial point gained from the questionnaires is students’ suggestion that after each topic has been taught, there should be the mini-test followed right away

audience and to expose them to scientific style of report writing. Instructors are not supposed to expect “perfection” in any area of the course.

In addition, before the beginning of the materials preparation, questionnaires were distributed among involved students searching out all important points in the preparation such as their interested topics, time spent on teaching, evaluation and their other suggestions.

As a result, the latest EAP Science materials have been designed as 2 books: general reading and writing skills, and scientific and specific reading and writing skills. At the end of both books there are mini-reports and oral presentations. The team was assigned to be responsible for each area of the materials as follows:

Writing Skills:

Assistant Professor Dr. Supanee Shinnawong

Jaroon Gaiwey

Walaiporn Pragorbsuk

Defining and Classifying:

Somporn Handee

Dr. Wimonlman Phoonsiriwong

Expressing Opinions

Walaiporn Pragorbsuk

Typesetting and Design:

Iain Moore

to ensure good performance in both teaching and learning. Points given in each test are kept as part of the course evaluation which will be counted together with the points of all other parts given in class performance and mid-term and final examination scores. So, students are quite fairly and accurately evaluated by both their performance in class

in all teaching areas and also by the summit judgments: the examinations. All mini-tests, mini-reports and oral presentations have been prepared to a certain extent by the material preparation team. That is, the team tries to limit the topics used in both the mini-reports and oral presentations so that students will be evaluated on more or less the same standard.

Finally, since the materials are new, the team organised questionnaires divided by topic area to evaluate the materials themselves. This was done to judge whether or not the materials work in the sense that the learners will be able to use them without too much difficulty and will enjoy the experience of doing so (Tomlinson, 1998, p.275). Of course, we cannot overlook the generalisational aspects of the survey process since the course is designed to serve more than 500 third-year students from the Faculty of Science. That means there is a group of instructors responsible for teaching many groups of students. Despite providing detailed teachers' notes and guides, the teaching methods and approaches of each instructor, together with students' personal feelings towards both the instructor's approach and the English language, must affect the evaluation of the materials. That is, "...no second language acquisition research can provide a definite answer to the real problems of second language teaching at this point.....There is no predetermined correct theory of language teaching originated from second language acquisition research" (Cook, 1996, p.294).

However, from the evaluation done by the team to gauge the students' attitudes and preferences towards the new EAP Science materials, we can sum up some significant points regarding the materials themselves. They are as follows:

Book I:

Reading: students tend to be pleased with the novelty and up-to-dated contents. They seem to find them interesting.

Paraphrasing: students tend to agree on the usefulness of this skill, but they seem not to be sure of their ability to be able to master it through the exercises provided.

Outlining: students tend to be satisfied with the overall area. That means all provided exercises and texts used are within the difficulty levels that are suitable for students' language ability.

Summarising: this is the best part of the first book. Students show satisfaction in the contents' interest, usefulness and modernity. However, exercises and activities provided are still not as satisfactory as they would like.

Giving Oral Presentations: the team found the same result as that of the summarising part.

In short, regarding EAP Science Book I, students feel everything interesting, but there is too much content for them to cope with. The team is to seriously reconsider this point.

Book II:

Describing Graphs and Tables: students find the methods of presentation for both the content and the language structure very clear and comprehensible. Still, they could be more satisfied with the quantity of exercises and activities.

Describing Process: students think this topic will be really useful in their future careers. This is a new area introduced to the course, and students find it practical.

Defining and Classifying: being a grammar based section, students have rated this highly for its usefulness and ability to transfer it to real life usage. This reflects the

students' perceived need to study more grammar.

Giving Opinions: students are satisfied overall but need more speaking practice. The section needs to be added with more activities to let students have a chance to try voicing their opinions.

Giving Oral Presentation: students are quite satisfied with the organisation of this part because they are guided and limited to more or less the same areas with little difficulty in the tasks to cope with.

In conclusion, when looking at the results of the material evaluation, the new preparation of the EAP Science materials is quite a success. However, the need for revision and adjustment is still what all instructors involved have to continue with. Together with this article, the complete statistics and results of the evaluation are added for those interested in the whole process.

2. Detailed Analysis of Results

This evaluation is based on questionnaires (See Appendix A for a sample of the questionnaires.) filled in by the students at the end of the first term teaching the new material. As this was a radical rewrite of the material, the viewpoints of both the teachers and student are vital in assessing the effectiveness and appropriacy of the material. On the whole, the main point the teachers made was that the first book contained too much material to cover in the time available. This point has already been rectified through denoting some tasks as non-obligatory, thereby reducing the amount of material to be covered, while still allowing the stronger students to be challenged where their teacher deems necessary.

The evaluation is divided into 3 parts; the first two parts concern the two books broken down into individual chapters and the final part is an overview of the whole course. The statistics in Appendix B were arrived at by allocating a value for each of the 5 boxes on the questionnaire, with 0 being the lowest (least positive) and 1 being the highest (most positive), and a mean was calculated for each question. The standard deviation was also calculated. This is a measure of how much the students varied in their responses. For example, if the standard deviation is very low, this means the students gave very similar responses; conversely, if the standard deviation is very high, this indicates that the students gave a wide spread of opinions. The mean+standard deviation and the mean-standard deviation results give an idea of the range in which the majority of students' answers fell.

Overall, the results are good, with the lowest mean score being 0.62, which corresponds to being just above 'moderate' on our scale of "least, low, moderate, high, highest." This means that, on average, there were no negative results, only varying degrees of positivity.

Book I

Reading

Looking at the statistics for the reading section, (See Appendix B for the statistical data.) we can see that the areas students rated most highly in terms of content and articles presented were usefulness and being up to date. With mean values of 0.76 for each of these areas, this is an excellent result for the rewrite. In terms of the materials being up to date, the low standard deviation of 0.14 is very positive in that it indicates that the students were, in general, all agreed that the

material was up to date. Another good result was for the material being interesting. In this section, there are two noticeably weaker results, for the difficulty level and amount of material, with means of 0.67 and 0.66 respectively. This ties in with what the teachers had said about there being too much material to cover in the time available, and it is likely that the students then found the material to be difficult when trying to cover it all in a limited time.

Another very high result is that for the usefulness of the language structures and vocabulary used in the material (0.74), which again has a very low standard deviation, which gives more confidence to the result. All other results were good, except for the amount of exercises and activities, which is most likely a result of there being too much material in the original version.

Paraphrasing

The paraphrasing section scored highly on the usefulness of content, language structure and vocab, and exercises and activities. Moderate to low standard deviation serve to give weight to this. Again, the lower scores were on amount of material and amount of exercises/activities. Another low result of 0.67 was for the ability to transfer the language structures and vocabulary to real life situations. This is a puzzling result, especially from this section as paraphrasing is one of the most practical skills when learning to use English in academic and research situation. Paraphrasing and citing other research and work is vital in writing academic English, as is paraphrasing for clarity. It is highly probable that the students were not clearly aware of the reasons for paraphrasing and also not aware of the need to avoid direct

quotation from others' work. This will be made more clear in future versions of the material.

Outlining

Once more, very high scores are seen for the usefulness of all aspects of the material and the other scores in this section are very good. We can also see that the students gave comparatively high ratings for the language structures and vocab used, in terms of difficulty, usefulness and ability to transfer to real life.

Summarising

This section received the best overall scores in book one, with several particularly good results for the contents' interest, usefulness and modernity and for the usefulness of the language structures and vocab. It is particularly good to note how interesting the students found this section. The section showed solid results in all the other areas, though showed weaker results in terms of amount of content and exercises/activities.

Giving Oral Presentations

The above pattern is seen once again in the Oral Presentation section — excellent results for usefulness over parts 1, 2, and 4, with weaker results for amount of material. Again this seems to reflect the idea that too much material was put into Book I.

Book II

Describing Graphs and Tables

In addition to the very high results for usefulness of the content and language structures that we have seen before, this section also has an excellent mean value of 0.75 for clarity of presentation methods for both content and language structure,

reinforced by a low standard deviation of 0.13, indicating that the vast majority of students were impressed by the material in this area. Very solid results are found in the other main areas, with the exception, again of the quantity of exercises/activities.

Describing Processes

Again in this section, we see high scores for usefulness of material, language and exercises. Another area which scores very highly was the ability to use the language structures and vocab in real life situations. This is probably partly due to the very practical nature of this section (which is a new skill introduced with this rewrite of the material) and is a very positive result which should have a good effect in terms of students' interest and motivation.

Defining and Classifying

As a very grammar based section, it is not surprising to see that students have rated this highly in terms of usefulness and ability to transfer to real life. Overall results in this section were good.

Giving Opinions

With notably high results for transferral of skills to real situations and, again, usefulness in terms of content and language, this section comes out as a success in terms of its aims. The low result for amount of material and exercises/activities reflects what students have said directly, which is that they would like more practice at speaking, and this will be provided by the extra supplement cards which will be used next year.

Giving Oral Presentations

The most radical new introduction in this rewrite, this section consists of a set of

11 video extracts that students watch while completing a worksheet geared around aiding the students' comprehension of the video. The students are then to carry out further research and investigation of the subject, presenting their findings to the class at the end. Consistently superb results can be seen for this section, from development of analytical thinking and development of the skills set out in the syllabus to ability to transfer these skills to real life and the usefulness of content, language and activities. Overall, an extremely satisfying evaluation.

General Comments

The evaluation shows that students are generally very happy with the material, with a significant overall improvement on the previous years. The consistently high results across the board for usefulness of material, language and exercises/activities shows that one of the main aims of the new material, that of making the material more practically applicable and making the students aware of the practical need for each skill, has been extremely successful and the team should pride themselves on this achievement. By making the material more practical, and by letting the students know what they are learning and why, students will become more motivated and be more satisfied as they complete tasks successfully.

Another good point is the acceptance of the new skills introduced in this rewrite, namely the oral presentations and describing processes. The video based approach to the second oral presentation section worked very well, both in terms of stimulating the interest of students and in terms of leading the students to produce varied and well researched presentations.

The recurrently poor results were in the students' assessment of the amount of content and quantity of material. This is more evident in Book I, reflecting the teachers' view that the first book contains an amount of content which cannot feasibly be taught to all levels of students in the time available. These comments continue into the second book, though this is most likely the result of teachers attempting to fit in the remainder of the first book at the start of the second half of term.

Subsequent Improvements

Since this evaluation was carried out, improvements have been made to the material to address issues which have arisen during the teaching and evaluation. The main one is the trimming down of Book I, in particular the reading section, by denoting certain articles and activities as optional. It was decided that this would be better than removing the material, as it provides an option for stronger students who are in need

of a challenge, and also acts as additional practice for weaker students. (The level of students taking this course covers an enormous range, from almost elementary level to fluent.) The paraphrasing section has been clarified in terms of informing the students about what the skills they are learning and why they are important. Extra supplement cards for eliciting group conversation and discussion have been added to the giving opinions section and should add extra interest there.

Conclusion

Overall, this evaluation shows the material to be highly successful in terms of achieving the aims set out and also in terms of involving and empowering students in their own learning, by developing interest and motivation through practical applications of skills and letting the students know what they are learning, why they need to learn it and also how they can apply it to real life situations.

The Authors

Walaiporn Pragorbsuk has been an English instructor at Chulalongkorn University since 1980. At the time this new EAP Science material was designed, she was the course coordinator, and that was why she became one of the team writers. She hopes what has been presented in the article may encourage other instructors to create some more appropriate materials for Chulalongkorn students.

At the time of the development of this course, Iain Moore was an instructor and consultant for scientific English at Chulalongkorn University Language Institute. He moved into the field of scientific English after receiving a degree in Astrophysics from Kings' college, Cambridge. He is now the Development Officer for a large UK charity.

References

Cook, V. (1996). Second language learning and second language teaching (New Ed.). London: Edward Arnold.

Tomlinson, B. (1998). Materials development in language teaching. Cambridge University Press.

Appendix B: Statistical Data

Book I	Effective Reading			Paraphrasing			Outlining			Summarizing			Oral Communication											
	mean	s.d.	mean+s.d.	mean-	s.d.	mean+s.d.	mean	s.d.	mean+s.d.	mean	s.d.	mean+s.d.	mean	s.d.	mean+s.d.	mean-	s.d.	mean+s.d.						
1. Is the content...																								
1.1 interesting?	0.72	0.15	0.87	0.56	0.15	0.88	0.73	0.15	0.88	0.58	0.15	0.88	0.74	0.14	0.88	0.6	0.14	0.88	0.72	0.14	0.85	0.58	0.14	0.85
1.2 at an appropriate level of difficulty?	0.67	0.15	0.82	0.52	0.14	0.82	0.69	0.14	0.84	0.55	0.14	0.84	0.69	0.16	0.85	0.53	0.16	0.85	0.7	0.14	0.84	0.56	0.14	0.84
1.3 useful?	0.76	0.16	0.91	0.6	0.15	0.89	0.75	0.14	0.89	0.61	0.14	0.89	0.74	0.15	0.89	0.59	0.15	0.89	0.75	0.17	0.91	0.58	0.17	0.91
1.4 up to date?	0.76	0.14	0.9	0.61	0.16	0.88	0.71	0.16	0.87	0.56	0.16	0.87	0.74	0.15	0.89	0.59	0.15	0.89	0.73	0.16	0.89	0.57	0.16	0.89
1.5 appropriate to the time available	0.66	0.17	0.83	0.48	0.18	0.8	0.64	0.17	0.81	0.47	0.17	0.81	0.61	0.18	0.8	0.43	0.18	0.8	0.64	0.16	0.8	0.48	0.16	0.8
2. Are the structures and vocabulary presented..																								
2.1 appropriate to the level?	0.69	0.14	0.83	0.54	0.14	0.84	0.72	0.15	0.87	0.57	0.15	0.87	0.7	0.15	0.85	0.55	0.15	0.85	0.69	0.15	0.84	0.53	0.15	0.84
2.2 useful?	0.74	0.13	0.88	0.61	0.14	0.89	0.77	0.14	0.9	0.63	0.14	0.9	0.75	0.13	0.88	0.62	0.13	0.88	0.74	0.12	0.86	0.62	0.12	0.86
2.3 able to be used in real situations?	0.69	0.17	0.86	0.52	0.19	0.86	0.71	0.18	0.88	0.53	0.18	0.88	0.69	0.16	0.85	0.54	0.16	0.85	0.69	0.16	0.86	0.53	0.16	0.86
3. Is the presentation of content and structure...																								
3.1 clear?	0.7	0.15	0.86	0.55	0.16	0.87	0.71	0.16	0.87	0.55	0.16	0.87	0.72	0.15	0.87	0.54	0.15	0.87	0.72	0.14	0.86	0.58	0.14	0.86
3.2 interesting?	0.71	0.16	0.87	0.55	0.17	0.87	0.7	0.16	0.87	0.54	0.16	0.87	0.71	0.17	0.88	0.54	0.17	0.88	0.69	0.16	0.85	0.53	0.16	0.85
4. Are the exercises and activities...																								
4.1 helpful in developing the skills laid out in the syllabus?	0.71	0.16	0.87	0.56	0.17	0.88	0.73	0.17	0.9	0.56	0.17	0.9	0.73	0.17	0.88	0.59	0.17	0.88	0.7	0.15	0.85	0.55	0.15	0.85
4.2 appropriate in amount?	0.67	0.14	0.81	0.53	0.16	0.81	0.68	0.17	0.85	0.51	0.17	0.85	0.64	0.16	0.8	0.49	0.16	0.8	0.67	0.14	0.81	0.53	0.14	0.81
4.3 interesting?	0.7	0.16	0.85	0.54	0.16	0.86	0.71	0.16	0.88	0.55	0.16	0.88	0.73	0.17	0.88	0.58	0.17	0.88	0.7	0.16	0.86	0.54	0.16	0.86
4.4 useful?	0.73	0.15	0.89	0.58	0.15	0.88	0.76	0.16	0.91	0.6	0.16	0.91	0.73	0.17	0.89	0.57	0.17	0.89	0.74	0.17	0.91	0.57	0.17	0.91
4.5 helpful in developing analytical thinking?	0.7	0.18	0.88	0.52	0.17	0.86	0.71	0.18	0.89	0.54	0.18	0.89	0.71	0.18	0.88	0.54	0.18	0.88	0.69	0.18	0.87	0.52	0.18	0.87

Book II	Defining + Classifying			Giving Opinion			Oral Presentation			Reading Graphs & Tables			Describing Process						
	mean	s.d.	mean+ s.d.	mean	s.d.	mean+ s.d.	mean	s.d.	mean+ s.d.	mean	s.d.	mean+ s.d.	mean	s.d.	mean+ s.d.				
1. Is the content...																			
1.1 interesting?	0.71	0.11	0.82	0.6	0.13	0.83	0.57	0.14	0.86	0.72	0.14	0.86	0.58	0.13	0.87	0.72	0.15	0.87	0.57
1.2 at an appropriate level of difficulty?	0.68	0.12	0.81	0.56	0.12	0.8	0.56	0.12	0.81	0.69	0.12	0.81	0.57	0.13	0.82	0.67	0.14	0.81	0.52
1.3 useful?	0.76	0.15	0.9	0.61	0.14	0.88	0.6	0.15	0.9	0.75	0.15	0.9	0.6	0.14	0.92	0.74	0.15	0.89	0.6
1.4 up to date?	0.7	0.16	0.86	0.56	0.13	0.83	0.56	0.15	0.87	0.72	0.15	0.87	0.58	0.16	0.88	0.72	0.14	0.86	0.58
1.5 appropriate to the time available	0.67	0.15	0.82	0.52	0.15	0.8	0.51	0.15	0.82	0.67	0.15	0.82	0.52	0.15	0.82	0.67	0.14	0.81	0.53
2. Are the structures and vocabulary presented..																			
2.1 appropriate to the level?	0.68	0.18	0.86	0.5	0.13	0.84	0.58	0.13	0.86	0.71	0.15	0.86	0.57	0.14	0.85	0.7	0.14	0.83	0.56
2.2 useful?	0.76	0.14	0.9	0.62	0.14	0.9	0.62	0.14	0.92	0.75	0.17	0.92	0.58	0.13	0.89	0.73	0.14	0.88	0.59
2.3 able to be used in real situations?	0.72	0.17	0.89	0.56	0.16	0.91	0.59	0.16	0.93	0.75	0.18	0.93	0.57	0.16	0.89	0.74	0.15	0.89	0.58
3. Is the presentation of content and structure...																			
3.1 clear?	0.72	0.16	0.88	0.56	0.13	0.84	0.57	0.13	0.85	0.7	0.15	0.85	0.56	0.15	0.88	0.7	0.15	0.86	0.55
3.2 interesting?	0.72	0.14	0.86	0.57	0.15	0.86	0.56	0.15	0.87	0.72	0.15	0.87	0.57	0.15	0.86	0.7	0.16	0.86	0.54
4. Are the exercises and activities...																			
4.1 helpful in developing the skills laid out in the syllabus?	0.72	0.14	0.86	0.57	0.15	0.86	0.57	0.15	0.89	0.74	0.14	0.89	0.6	0.15	0.89	0.73	0.15	0.88	0.58
4.2 appropriate in amount?	0.68	0.14	0.82	0.54	0.15	0.81	0.52	0.15	0.83	0.69	0.14	0.83	0.55	0.15	0.83	0.68	0.14	0.82	0.54
4.3 interesting?	0.72	0.16	0.87	0.56	0.15	0.86	0.55	0.15	0.88	0.72	0.16	0.88	0.56	0.15	0.85	0.72	0.16	0.88	0.56
4.4 useful?	0.74	0.15	0.89	0.59	0.17	0.9	0.57	0.17	0.93	0.77	0.16	0.93	0.61	0.16	0.89	0.73	0.15	0.89	0.58
4.5 helpful in developing analytical thinking?	0.7	0.18	0.87	0.52	0.16	0.87	0.56	0.16	0.9	0.74	0.17	0.9	0.57	0.17	0.86	0.7	0.16	0.86	0.53