Research Methods in Applied Linguistics: Encouraging students to become researchers
Diana Po Lan SHAM


Abstract
Before doing any research, the students have to set the aims of research first. Otherwise, they will lose their directions at some of the stages in the research project. The students are provided an introduction to different research sub-disciplines and aspects in Applied Linguistics, and encouraged to develop a strong theoretical base for their research by reviewing first hand information and literature. Once the research area, theories, models and topics are fixed, it is the time to design the appropriate research methods for data collection.

This paper focuses on setting the rationale, paradigms, problems and solutions in data analysis, and application of research methods. As there is a large variety of research methods in Applied Linguistics, they need to set the criteria of selection of research methods. Through the procedure, they develop skills for carrying out the research and learn by trial-and-error. During the research, they need readjustments and modification of the content, techniques and evaluation of the methods in the on-going processes. After data collection, they assess whether the research paradigms and their applications are effective and appropriate to the theme of the research and present the results in a proper format for their theses.

Introduction
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The focuses of this paper are setting the rationale for the selection of paradigms, application of research methods, and problems and solutions in data analysis. As there is a large variety of research methods in applied linguistics, they need to set the criteria of selection of research methods. Through the procedure, they develop skills for carrying out the research and learn by trial-and-error. During the research, they need readjustments and modification of the content, techniques and evaluation of the methods in the on-going processes. After data collection, they assess whether the research paradigms and their applications are effective and appropriate to the theme of the research and present the results in a proper format for their theses.

This paper consists of: (1) Introduction; (2) The characteristics of a good researcher; (3) The selection of research methods; (4) The readjustment and modification during research; (5) The problems of data analysis; (6) The reflections of students; (7) Conclusion. Based upon my supervision and experience of research, a number real cases and examples are presented and discussed in order to make the application of research methods and data analysis more convincing, concrete and down to earth. Meanwhile, reflections of the students are humane and real in our life. In other words, research in applied linguistics is not only scientific, cool and mechanical, but also interesting, warm and knowledgeable.

The characteristics of a good researcher
If anyone wants to become a good researcher, there are four characteristics needed according to Dornyei (2007). The first characteristic of good researchers is “they have a genuine and strong curiosity about their topic” (Dornyei, 2007, p.17), which means the novice researchers have driven by their passion and genuine interest on their topics. The second one is having common sense as the applied linguists should engaged to the real world and be down to earth. Furthermore, creative thinking and good ideas is another important feature for successful
researchers even though they use simple research methodology that based upon original insight. Lastly, a good researcher should be disciplined and responsible having a sense of accountability to communicate her/his findings with others.

Before supervision, my students have to propose their research areas and topics that they are interested in and we retune the topics later. Generally speaking, the topics for TESL research are related to application of theories in linguistics, educational psychology and pedagogical practice. As we collect data in schools and universities, the research is applicable in real world and we deal with it with common sense. In other words, my students have two characteristics of good researchers. Further discussion of the other two aspects will be presented in conclusion.

**Selection of research methods**

As the research areas of applied linguistics have been growing rapidly, there is a variety of old, new and mixed research methods. How to select the appropriate paradigms, qualitative research or quantitative research, relevant to the research topic is top priority at the first stage of the research. If the students do not have any pre-requisite knowledge about research methods, it will be very difficult. In fact, most of the MA students have some understanding of various paradigms if they have taken the courses in applied linguistics or psychology, so they may have some ideas to select the relevant methodology. When we consider different approaches for the research, we have to make sure that we concern about the quantitative data or qualitative data. That is another alternative that we may employ mixed methods for collection of quantitative as well as qualitative data.

For collection of quantitative data, we may choose questionnaires and experimental designs, whereas interviews, case study, ethnography and diary research are used for qualitative data collection. In quantitative research, the data collected are presented in numerical form and analyzed by statistical methods. The most commonly used statistical software in applied linguistics and social sciences is SPSS. In contrast, the data in qualitative research are non-numerical and open-ended. For example, the recordings of an interview are interpreted in qualitative content analysis and by non-statistical method. Meanwhile, mixed method research combines quantitative and qualitative methods for both data collection and data analysis. The application of a consecutive questionnaire and an interview in a research is a typical example of mixed method approach.

Based upon “meaning of numbers”, quantitative research seems to be more scientific, objective with less individual variations. Comparatively speaking, qualitative approach depends more on the researcher’s subjectivity, training and experience linked with the individual respondents. Whereas the quantitative paradigm offers macro views of overall trends of the world by structured and scientific methods, qualitative research provides micro perspective of daily realities of the world through flexible and sensitive ways.

Generally speaking, the scientific method used by quantitative research consists of three basic steps: First, identifying a problem; second, set an initial hypothesis; third, collecting and analyzing empirical data for testing the hypothesis with standard procedure. In contrast, context-individual variations are allowed in natural settings without any hypothesis set before or any fixed method for qualitative research. There are strengths and weakness in either quantitative or qualitative research, so it depends on the topics to select either one of them or combine both types in your research by mixed method approach.

For instance, we want to test whether motivation is a major factor affecting English learning for primary students in ESL classrooms? We may choose a quantitative method to design a questionnaire with a 3-point to 7-point scale for the subjects, or prefer a qualitative approach of interviewing the primary students and recording. There is another choice of combining a questionnaire and an interview for this research by using the mixed methodology.
The criteria of selection of research paradigms depend on what are your expectations and hypotheses.

After we determine to use which method, we have to apply it for collection and analysis of data. However, we have to face some trials and errors in application of the research methods and make readjustment and modification during research.

**Readjustment and modification during research**

Therefore, I am going to quote and analyze a few examples of my students’ experience in readjustment and modification of questionnaires, teaching materials, and experimental designs etc. in application of the research methodology.

**Modification of an old questionnaire into a new one**

During the research process, Student P designed a questionnaire focusing on the impression and evaluation of English learning from two Junior 2 classes. When she came to me, it is quite funny that she had provided options YES/NO in three questions, some other with three choices, and even some with four options. As the number of options in the questions was not consistent, it was not easy to group them together for data analysis. The choices of each question were arranged such as: A. Agree; B. Disagree, and C. No opinion, while the other one was designed as A. I like; B. No feeling; C. I dislike. In other words, the choices of the questions were not presented in the same format which would be difficult to analyze the data. Then I explained to her about the problem in the design of an unscientific questionnaire and how to modify it into a scientific one. The commonly used formats are 3-point, 5-point and 7-point scales as we can describe by a bell-shaped curve in case of normal distribution, which means a few achieve the high scores and a few others as the lower ones with the largest population of average bulking in the middle. Of course, 5-point scale is the most popular format. Although she worried a lot about the original questionnaire and felt frustrated and upset about her design, I encouraged her that it was good to learn from mistakes during research. Therefore, she unified the options of all the questions into 3-point scale and made two extreme choices as A and C with the neutral one as B. She had just taken my advice, and then, changed the old questionnaire into a new one as follows.

Name: ___________________  Class: ________  Student ID: __________ Age: ____ Sex: ____

Dear all, we will not judge you for your performance in this questionnaire. Hence, you should generate your answers honestly. Your personal information will be kept secret.

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<tbody>
<tr>
<td>1) Are you interested in English Learning?</td>
<td>A. Yes</td>
<td>B. I don’t know</td>
</tr>
<tr>
<td>2) Do you usually answer teacher’s questions in English class?</td>
<td>A. Usually</td>
<td>B. Sometimes</td>
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<td>3) How do you feel after finishing learning a new unit?</td>
<td>A. I can feel the sense of fulfillment</td>
<td>B. No special feeling</td>
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<td>4) Do you think memorizing vocabulary is helpful for your English learning?</td>
<td>A. Yes, it is really helpful</td>
<td>B. I don’t know</td>
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<td>5) Except for the assignments, do you like reading extra-curricular English materials, such as English magazines and newspaper?</td>
<td>A. Yes, I do</td>
<td>B. Sometimes</td>
</tr>
<tr>
<td>Question</td>
<td>A. Yes, I do</td>
<td>B. Sometimes</td>
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<td>6. Do you lack of initiative in English learning without others’ pushing?</td>
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<td>7. Do you need quite a long time to refresh yourself, when reviewing English?</td>
<td>A. Yes, I do</td>
<td>B. Sometimes</td>
</tr>
<tr>
<td>8. Do you feel tired, even boring, when learning English?</td>
<td>A. Yes, I do</td>
<td>B. Sometimes</td>
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<tr>
<td>9. Are you filled with unbounded confidence in your English learning?</td>
<td>A. Yes, I am</td>
<td>B. Sometimes</td>
</tr>
<tr>
<td>10. Do you have a private tutor to help with your English learning?</td>
<td>A. Yes, I do</td>
<td>B. Sometimes</td>
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11. Which English test score is your favorable one since you have been a junior student?

12. If you meet with some difficult problems in English practicing, you will

   Thanks for your cooperation. 😊

**Problems for student C's experimental design for ESL vocabulary teaching**

In the research project, we conducted experiments to test the hypothesis that the learning outcomes of teaching English-as-a-second-language (ESL) vocabulary for Junior 2 (J2) students in China by Audio-visual strategies are better than by Grammar Translation Method (GTM). Student C was responsible for the experimental design including the teaching plan and teaching materials, and played the role of experimenter to collect data in two J2 classes. Thus, she had the following design, experiment and result.

**Design**

One period of 40 minutes for J2 class is divided into two sessions in order to compare the effectiveness of ESL vocabulary teaching by Grammar Translation Method (GTM) with that of Audio-visual strategy. The hypothesis is that the performance of the students in the written tests in Audio-visual strategy is better than that of GTM.

**Session 1: 20 mins. GTM (Control group)**

**Content:** A Vocabulary of plants  
**Teaching medium:** Chinese (L1)  
**Lecture:**

The experimenter teaches six new words of plants to the J2 class. Each word is accompanying with its phonetic transcription and Chinese translation in the ppt. Each of them embedded in a sentence. Students are asked to repeat the words and the sentences.

**Post-test (5 mins):** The students write down the English words for pictures of plants on the test papers individually.

**Session 2: 20 mins. Audio-visual strategy (Experimental group)**

**Content:** A vocabulary of wild animals  
**Teaching medium:** English (L2)  
**Lecture:**

The experimenter presents the J2 class a cartoon twice. And then, a modified version cartoon which consists of ten sentences is presented. She reads six sentences out of twelve aloud and teaches the class the six new words of wild life.
**Post-test (5 mins):** The students write down the English words for pictures of wild animals on the test papers individually.

**Results:**
At the end of the class, the experimenter asked the students’ feedback. Most of the students enjoyed the cartoon very much and preferred learning in the paradigm of session 2 rather than that of session 1. Thus, the verbal responses of the students are contradictory to their results in the written tests.

Based upon the results of the post-tests, the learning outcomes of vocabulary acquisition in GTM are proved to be better than those in Audio-visual strategy group. The learning outcomes of both Audio strategy and Visual strategy groups advance that of GTM, control groups, in other classes, as the results fit the hypotheses. Comparing to Audio strategy and Visual strategy groups, the results of Audio-visual strategy group are inconsistent and not align with those of the previous two.

After comparing the results in the two methods, there are two alternatives for the following action. One way is just reported the results of the written tests at the end of each session and interpret them as ESL vocabulary teaching through GTM, the traditional method, is better than using audio-visual strategy. The other way is to find out any problems in design of the experiment in two sessions which affect the results. Finally, we find out the problems for C’s experimental design for ESL vocabulary teaching as follows.

**Problems:**
There are a number of problems in the design and format, presentation, and selection of target words (teaching materials) as well as sentences in session 2.

1) **The format:** The teaching format in session 1 is clear and focused, but the design of session 2 is confusing and unfocused.

2) **Redundancy and Missing:** A cartoon is presented twice which is redundant. Some of the sentences in the cartoon are taught, whereas some of them are new. Therefore, the experimenter reads the new sentences ignoring the known ones.

3) **Target vocabulary:** The selected vocabulary of the wild animals is too difficult and too rare for the students.

4) **Sentences:** Some of the words in the sentences are unknown to the students, so they cannot understand the meaning of the sentences, and also, they do not recognize which are the target words for new vocabulary learning.

After we had found out the above problems, the students re-designed the teaching materials in order to make the sessions balanced instead of the heavy cognitive load created in second session using the audio-visual aids. Student S substituted Students C for the design of the teaching plan and teaching materials and as the experimenter for teaching J2 ESL vocabulary. She chose another set of new vocabulary, which is more common, for the participants and replaced the cartoon, which consisted of a story forming by a number of sentences, into videos of separate sentences. Each sentence contained a target word. During the experiment, she used the same format as session 1. As a result, the participants learnt more effectively in session 2 than session 1 as we hypothesized. The result indicated that the learning outcomes of teaching J2 ESL vocabulary in China by Audio-visual strategy were higher than those of GTM.
Problems in data analysis

In data analysis stage, the software SPSS is generally used and relevant graphs will be produced based upon the data of questionnaires and experiments to test the hypothesis. When we expected to compare the trends of motivations of English language learning of males and females, a double line graph is appropriate. If the proportion of each group in a population of extra-curricular activities using English, we employ a pie graph. But how about comparing the effectiveness of two different methods in TESL, what kind of graph is appropriate for the data analysis?

If the numbers of participants of the two methods are the same, we may use bar graphs with total scores. On the other hand, if the numbers are different, we still can use a bar graph but with average scores instead. One of my students investigates the differences of learning Chinese as a second language (CSL) by comparing English native speakers and Korean speakers. After receiving the questionnaires of the two groups, she tried to use pie graphs to interpret the data collected. Consequently, it is found that the English speakers group occupied the larger proportion of each pie as the number of the participants in this group is much more than the Korean speakers. In other words, the data collected are not analyzed in a proper way as she misused the pie graphs for analysis of two groups but not a whole population. I advise her to change the pie graphs into bar charts. As a result, we can distinguish the differences of learning CSL between the English native speakers and Korean speakers successfully.

Reflections of the students

After data collection and data analysis, the students, major in Teaching English as a Second Language (TESL) under my supervision for the Final Year Projects (FYP) and my UIC research grant project are advised to write down their reflections in order to let me see what they have learnt and what they feel about the research. Here I quote the full contexts of the reflections of students M, C, P and S.

Student M’s reflection

1. About Questionnaires: we learnt how to design a questionnaire before in Action Research class. Design a questionnaire is more complex than what we learn from the lecture. I designed a questionnaire which turned out to be disordered, illogical and unscientific. I learnt from my supervisor that you should design your questionnaire according to your aims. The questions you asked can help you arrive at a conclusion. You start with the outline of the questionnaire instead of the specific questions. For example, my questionnaire asks about the basic information, objectives of the class, students’ behavior and attitude. Furthermore, my supervisor told me that the questionnaire which follows the certain format can help you get a more scientific and clear result. The most popular format is the 5-options format. The options listed from strongly disagree to strongly agree. Participants can tick one of the five which correspondent to his/her situation the most.

2. About Triangulation: After determined the questionnaire and interview method, my supervisor suggested to me to add classroom observation as well. It helps to reduce the uncertain factors of interpretation and confirm the findings by triangulate my research methods. The subjects of those three methods are different. (questionnaire-students, interview-teacher, classroom observation-observer and students) It helps to get information of different sources.

3. About Data Analysis: I had no idea about how to analyze my data at the beginning. I didn’t have a plan until I talked to my supervisor. I think my data is unsuccessful since it turns out to be very different from my hypothesis. My supervisor told me that those data still can be analyzed and explained. We should find out the reasons and theories to support the result. The
Students C’s reflection

1. Before my experiment: It is the first time for me to do an experiment, so I am confused about doing an experiment independently. The early preparation is very important. The first thing I need to do is writing a lesson plan for my experiment. Class design is difficult and I modify it for many times in order to have a successful lesson. For the first time, the vocabulary teaching in the lesson plan for two teaching methods are not balanced, so I wrote it again. The second time, the teachings are balanced, but the vocabulary in two teaching methods are not balanced. The vocabulary for the first teaching method is harder, obviously, than another one. As a result, considering about the defects in the previous two lesson plan, I need to plan the lesson for the third time. Although the process is very complicated and difficult, I still learn a lot about how to plan an experiment in a precise way.

   After designing the lesson plan, another thing I need to design is a questionnaire. I am ignorant about questionnaire design. I searched on the internet and finished the first draft. Then my supervisor corrected the draft and gave me some hints about how to ask questions. After corrections, I showed my questionnaire to my supervisor again, including a Chinese version. For this time, the English version is almost OK, but there were some problems about translating problems. When I finished the questionnaire finally, I learned other things except the experience about designing a lesson.

2. During the experiment: Generally, the experiment I did is fluent, but there are still some small problems, like sometimes forgot the words that I want to say and the time for each session is not balanced in one class. The experience tells me that I should be familiar with every word that I would say in the class and I should think of everything as possible as I can.

Students P’s reflection

Under the research group which is led by Dr. Diana Sham, I am in charge of one of the vocabulary teaching strategies, the Audio-aid Teaching Strategy, and the rest are Visual and Audio-visual strategies by my peers. Researching and studying the Audio-aid teaching Strategy is also one part of my own final year project (FYP). I think this kind of group research project is efficient and it is mutually beneficial. That is to say, while I am making some contribution to the research group, I am also making it for my final year project. In my own project, besides studying the teaching strategy, I also study the language learners’ motivation.

   I have learnt an ample amount of information during the group and also the individual supervision. In the group supervision, we have different researching directions, but all of us are under a big topic. We would gather together for short meetings every time we make some progress. For instance, after all of us finished the first draft of lesson plan, we discussed the strengths and weaknesses of our own works. We learnt from each other and at the same time, we were improving ourselves. For the individual supervision, I also learnt things from it. My supervisor pointed out that the first draft of questionnaire that I designed was informal and unscientific. She taught me how to design a scientific questionnaire and some details that I should be aware of. Now I know the technique of how to propose questions and set up the options for a questionnaire.

   The procedures of the experimental teaching are as follow: first of all, the subject students are from the Zhuhai Number Eight Middle School and they are the year two class 10 and 11 students. I taught one lesson for each class and the lesson length was 40 minutes. Each 40-minute session was broken into two sub-sections. In each sub-section, I used different strategies to teach the target vocabulary. In the first sub-section, I used use Grammar Translation Method (GTM) and in the second sub-section, Audio-aid Strategy was used. Seven
different words were taught in each section and at the end of sections, there was be a 5 minutes reviewed quiz given to the students to check their comprehension of the target vocabulary. After the class, I gave the questionnaires to the target students and the questionnaires were used to identify their English language learning motivation.

The outcome will benefit not only the research group but also my own project. From taking part in the research group to conducting an experiment, I learn the effectiveness of cooperation and the academic and scientific way of researching.

**Student S’s reflections**

1. The design of lesson plan must be precise.
2. In order to compare two methods, each part of class should be balanced, including the procedures and the words selection.
3. In a team, it is important to have good communication between each member. In this way, other members can help you find out some problems and solve them.

**Conclusion**

Based upon the information discussed above, we understand that research methodology in applied linguistics is not only theoretical but also applicable in real world. During the research, the novice students explore their interested topics, select related research methods, and learn from the data collection and data analysis. Similar to climbing up a mountain, there are different levels that they experienced ups and downs in making mistakes and corrections in the on-going process before reaching the top. However, the students enjoy learning and employing the scientific ways to find out the problems and problem-solving in research individually or as a group. As they communicate with their supervisor, the group members and the participants, they have found research interesting, interactive, humane and warm. After taking the advices in supervision, they have found that the paradigms they have learnt before are very helpful for data collection in research in applied linguistics.

Referring back to the end of section 2, the students under my supervision have the first two characteristics of a good researcher mentioned by Dornyei (2007). The third criterion is that most of our research is not costly and no machines needed. Thus, the students only employ simple research methodology such as questionnaires, interviews and experiments with their own creative ideas and critical thinking. After data collection, the students face the problem of choosing the appropriate interpretation. Finally, they solve the problems in data analysis and present their findings in a scientific structured way. To certain extent, they have had the four characteristics of good researchers from various aspects.

**Reference**


The Author
Diana Sham is an experienced educator and a psycholinguist. She joined conferences, presented papers and visited top universities in New York, San Francisco, Boston, Toronto, Sydney, Hong Kong, Macau, Beijing, Shanghai, & Zhuhai. She also received “Outstanding Paper Award” (2009 Conference, HKUSPACE & MUST).