

Using Methodological and Data Triangulation in English Language Teaching Research

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Abstract:

Methodological and data triangulations refer to the combination of various research techniques, methods of data collection and analysis for studying a particular question in a rigorous manner. This paper details the discussion on the concepts of methodological and data triangulation and their usefulness in research practices in general and with particular reference to foreign language education research in the Pakistani perspective. It is argued that employment of a single research instrument or research method to understand a complex phenomenon like the English language education is not desirable. An attempt has, thus, been made to record the authors' own experiences in collecting and analysing data from different sources using different methods. Triangulating the achievement test, the questionnaires, interview data and Observation data not only helped the researchers to cross validate findings but it also provided an opportunity to undertake the study from all angles so as to arrive at a deeper understanding of the phenomenon. The study concludes that methodological and data triangulation strategies are quite useful in studying various phenomena associated with English as foreign language education.

Introduction:

The qualitative-quantitative conflict has continued unabated in social science research during the past century (Johnson and Onwuegbuzie, 2004). Those on the quantitative side of the spectrum believe that the social reality should be viewed in the same manner as is the scientific or physical reality and that empirical justification of the hypotheses is the hallmark of research (ibid). As against it, the qualitative purists hold the view that social reality is fluid and dynamic (Corbin & Strauss, 2007), different from the scientific and physical reality and thus methods employed in studying the social phenomenon should be interpretative in nature. They believe that it is neither possible nor desirable to construct realities that are free of time and context. Moreover, they differ from the quantitative purists in that they hold that emotional detachment and objectivity are impossible to achieve because it may be unfeasible to study something from a distance (Greene, 2007). The purists from both the sides of the continuum seem to advocate the incompatibility thesis which states that the two approaches and the methods associated with them should not be mixed (Johnson & Onwuegbuzie, 2004). There have been several attempts at the resolution of the paradigmatic and methodological differences between the two extremes through mixed method research approaches (Creswell & Clarke, 2007; Teddlie & Tashakkori, 2008). Recently, there have been calls for the interaction of the two research traditions in the field of social science (Olsen, 2004). One such way of interaction is triangulation (ibid). Triangulation is the use of multiple data sources, methods, subjects/participants or theories in a single research project (Denzin, 1978).

Language teaching is a dynamic phenomenon composed of diverse features, involving various stakeholders. Undertaking the language teaching research affords the researcher unending opportunities which emerge from the chances to look at the phenomenon from various angles. Indeed the true scenario comes to the fore once we try to understand it from different perspectives, employing different strategies. Triangulation provides us with one such opportunity. It is a concurrent mixed method research design (Creswell and Clark 2007) in which both the qualitative and the quantitative data are used for a meticulous examination of the research problem.

The concept of triangulation was first conceived and put into practice in social science research by Campbell and Fiske (1959). They posited the concept of triangulation to view the phenomenon from different angles through employing the 'multitrait multimethod matrix' so as to develop construct validity (DeMarrais & Lapan, 2004). However, it was Denzin's (1978) seminal work that provided the most useful insights into the concept of triangulation. He classified triangulation into four broad categories.

1. Theory triangulation involves using more than one theory or perspective for a single data-set interpretation.

2. When more than one methods are used in a study, it is termed as methodological triangulation
3. In observer triangulation, the study employs more than one observer to ensure that there is agreement on the issue by both/all observers.
4. In a situation where various tools like questionnaires, observation, interview and experiments are used, the phenomenon is termed as data triangulation.

J. D. Brown (2001) summarised the works of Denzin (1994) thereby adding three more categories to Denzin's classification.

5. Interdisciplinary triangulation implies the use of one or more disciplines in a single study e.g. a linguist may triangulate sociology and linguistics.
6. Time triangulation means that the data may be collected at various points in time as is done in longitudinal studies.
7. Location Triangulation refers to gathering data from various data collection sites for instance different schools in different cities. (Brown, 2001, p.228,229)

Majority of the social scientists and researchers would agree with Cohen, Manion & Morrison that "the notion of triangulation bridges issues of validity and reliability" (2000, p. 114). Understanding an issue from multiple perspectives adds credibility to research (Schlebusch & Thobedi 2004). Data triangulation is useful because it helps in negating any chance whereby internal validity of the method is compromised (Fielding, 2010). Every data collection method, technique or tool has its particular limitations that may give birth to the issues of internal validity. To counter this problem, it is helpful for the researchers to employ multiple methods of data collection. The limitations of one research method can be compensated with the strengths of the other (Lincoln & Guba, 1985).

It is, however, misleading to assume that the scope of triangulation is limited only to the concepts of validity and reliability. In addition to tackling these issues, triangulation helps in adding a new perspective to the collection and analysis of data. Another advantage is its use as an innovative practice in devising a conceptual framework. Instead of being used as a tool for validation, it is used for deeper understanding of the issue at hand (Olsen, 2004). Triangulation helps the researcher to look at the issue from all possible dimensions (Mackey and Gass, 2005). Employing a single method or a single research instrument might not present the true picture whereas using a variety of methods to collect data helps in studying an issue from all facets.

Research Design for the Present Study:

This part of the paper explains the research settings, the data collection tools and procedures, data analysis and interpretation and convergence of the data.

This study was carried out to assess the usefulness of autonomous learning in English classes at higher secondary level in Pakistani schools. It is common with the researchers to use with-in method triangulation in which various strategies from either the quantitative or the qualitative methods are used. For instance, a questionnaire might be triangulated with an achievement test in the quantitative methods or the interview data might be triangulated with observation data in qualitative methods (Onwuegbuzie & Leech, 2005). This study employed not only the with-in methods triangulation but also the across methods triangulations. It was a mixed method study and adopted a multilevel variant of triangulation design (Creswel & Clark, 2007) in which both the quantitative and the qualitative data were collected from different subjects/participants for an in-depth understanding of the issue at hand. To cite an example of the multilevel variant of the Triangulation Design, Creswell & Clark (2007) refer to Hendrix, Fournier, and Briggs (2001) who made use of both the qualitative and the quantitative data, to understand the effectiveness of students' co-therapy teams in family and marriage therapy programmes.

The quantitative data, i.e. the data collected through experiment, questionnaires to the teachers and qualitative data, i.e. students' interviews and detailed observation were analysed separately and were later compared, contrasted and converged.

Experiment was conducted at a higher secondary school in District Khushab in 2017. The researchers randomly assigned 100 students to conventional class (n=50) and autonomous learning class (n=50). The conventional class was taught through GTM. The groups were taught for six weeks. The researchers carried out observation of the two classes at regular intervals. The researchers made sure that they spent an equal time to observe the classes. Both the classes were observed for 500 minutes each. In addition, the researchers selected five students who obtained the highest marks and five other students who obtained the lowest marks from these groups were selected for interviews. Before arriving at a conclusion, the researchers deemed it fit to administer

questionnaires to 200 teachers of English in the district in order to assess their attitude toward autonomous learning.

Methodological Triangulation:

Whenever there is a question of cause and effect, conducting an experiment is considered the most correct approach. Primarily, the study employed the pre-test post-test experimental group design. An experimental study should including random sampling, different treatment to groups with a pre-test and post (Brown & Rodgers 2002).

To fulfil these conditions, the researchers randomly selected 100 higher secondary school students as a sample for the experimental study. We conducted a pre-test and then assigned the students to different groups on its basis. One group was subjected to autonomous learning conditions while the second group was taught through GTM. However, after conducting the pre-test, we made sure that the two groups were equal in their previous achievements as well.

The groups were taught for six weeks. There was a post-test following the treatment to see if any of the two groups was better than the other.

The research tools used in this study are the following.

1. Academic Record of Students
2. Test
3. Teachers' Questionnaire
4. Students' interviews
5. Observation

Academic Record of Students

The academic record of the students was obtained before their assignment to the two groups to make sure that the internal validity of the experiment was not compromised.

Test:

The purpose behind developing the achievement test was to gauge the performance difference between groups. In research process, a language test helps us in determining order and rate of students' learning at a given point in time (Bachman and Palmer, 1996). Test measured students' overall linguistic ability with special reference to the course they had covered during these six weeks. Half of the test (50 marks) contained multiple choice questions while the other half was comprised of essay type questions.

Questionnaire:

For a better understanding of the results, we administered a questionnaire to 200 English teachers at higher-secondary level in the district. The questionnaire contained items related to autonomous learning, students' ability to gain linguistic competence without teachers' direct control, ability of the students to take responsibility for their own learning in various aspects of language, the usefulness of autonomous learning in Pakistani context in general and English education in particular, and teachers' attitudes towards the use of autonomous learning in Pakistan.

Interview with the Students:

Experimenting a new methodology or approach with students does not mean that they should be regarded as mere subjects who have no control over whatever is happening. The students are rational and reflective beings and that is precisely what autonomous learning stands for. Hence, we decide to develop interviews for the students as well so as to gain an understanding of how they viewed their learning in general, and what their opinions about autonomous learning, in particular, were. We used a semi-structured interview to gain insight into students' experiences as well as expectations. We preferred using a semi-structured interview over a structured one because the former is flexible and ensures data quality without compromising the structure. The researcher defines the problem s/he wants to understand and develops certain questions with the help of which s/he can gather the desired information and insights from the interviewees or participants of the study.

The researchers selected five students from each group for semi-structured interviews. The students were willing for tape recording of their interviews. Hence the interviews were recorded and later transcribed. The best thing about transcription is that we can go back and forth in data to find interesting categories and themes (Breakwell, 2006). Hence, it makes the process easier and we can conveniently analyze the interview data and write the report.

Observation:

In qualitative research methods used for social science research, observation occupies a prominent place (Abbuhl & Mackey, 2008). A social phenomenon is intensively and methodically recorded through observation (Kawulich, 2005). Chen (2008) believes that using observation appropriately

nullifies the chances of inaccuracies and bias linked with other methods of research in a study. Observation can be used to elaborately discuss a particular issue, for collaboration of findings and to triangulate data or findings in order to add richness and variety in research (Chilisa & Preece 2005)

Observation can either be participant or non-participant. Whereas in the former type of observation, the researcher becomes fully involved in the process and is an active member of the sample, in the latter, s/he has to be unobtrusive (Gravetter & Forzano, 2008). We decided to use the non-participant observation in this research because we did not want to risk internal validity of the experiment. There were chances that participant observation may lead to behavioural changes among learners, and this could potentially harm the entire process of experimental research.

Another issue was whether to video-record the process or not. The option was dismissed due to the same reasons as outlined above. Moreover, video recording could have made the learners as well as the teachers very conscious. Hence, we decided to collect field notes that later be analyzed. The researchers developed a few themes. On the basis of these themes, categories were decided before collecting data. Since we observed the two classes for 500 hours, a tremendous amount of data was at our disposal.

Analysis:

Three important features of the methodological and data triangulation, when it comes to data analysis, are

1. Consistency (seeing if there are same results)
2. Contrast (seeing if the findings contradict each other)
3. Complementarity (seeing if the findings add a new perspective to the findings already conceived from a different method) (Hammond & Wiriyapinit, 2005).

Findings: Data Triangulation in Practice

For data analysis, the strategy of crossover tracks analysis was adopted in this study. In the Crossover tracks analysis, findings from the qualitative analysis inform the analysis of the quantitative data, and the vice versa (Teddlie & Tashakkori, 2008). Thus, data from each source was separately analysed but both the forms of analysis were intertwined. Description of the data triangulation as used in this study follows in the next section.

Table 1. Comparison of Groups' Academic Achievement Prior to Treatment

Groups	N	M	Standard Deviation	t-value	p-value
Experimental Pre Test	50	65.02	12.681	.0524	.602
Control Pre test	50	63.66	13.290		

Comparison of the Autonomous group and GTM in academic achievement prior to treatment shows that the two groups were equivalent as far as their achievement level at school was concerned. The t-value is 0.524 while the value of p is 0.602, which is higher than the selected probability level. This shows that the groups are suitable for treatment in the experimental study.

Triangulation of Academic Record of the Students with the Pre-test

A pre-requisite for experimental design is that the groups should be similar. Data in the above table fulfils that demand. However, in order to ensure that nothing is left to any chance factor, the researchers decided to triangulate the findings of the academic achievement with that of the pre-test so that the results are reliable and valid.

Random assignment of the students to two groups was carried out based on their pre-test scores. The researchers used t-test to see if a significant difference existed between the achievements of the two groups. The findings from the pre-test revealed that there was no significant difference between the achievements of the experimental group and the controlled group.

Table 2. Pre-test Comparison

Groups	N	M	Standard Deviation	t-value	p-value
Autonomous	50	35.2	4.33	.327	.744
GTM	50	34.9	4.82		

Triangulating the Post-Test, Observation, Teachers’ Questionnaire and Students’ Interviews

Following the six-week long treatment, the two groups took a post-test. The results of the post-test showed that autonomous learning environment provided to the experimental groups yielded positive results as the students taught through this approach performed considerably better than their counterparts in the post-test. The results show autonomous group’s improved performance in the post-test scores. However, these do not tell us anything about the class environment, students’ attitude toward the two types of methodologies used, their participation in the class and willingness to take responsibility for the learning. In order to probe all these issues data from observation and interviews with the students were used. Data acquired through experiment was triangulated with the observation and interview data to understand the issue from all angles and to also interpret the finds of experiment.

Table 3. Post-test scores of the students

Groups	N	M	Standard Deviation	t-value	p-value
Autonomous	50	58.71	5.70	5.35	.0001
GTM	50	52.33	6.20		

Observation of the two classes helped the researcher to gather insights into the teaching and learning philosophies behind the two approaches and also the methods and strategies adopted by the teachers. The teacher in the traditional GTM class occupies the centre stage, dictating not only the course but also acting as a master who knows everything while his students know nothing. This was in sharp contrast to the class that experimented with autonomous learning. It came as no surprise that the teacher in the autonomous learning group gave the students so much confidence that they were willing to take responsibility for their learning. The teacher made the students understand the course objectives and course learning outcomes. As against it, the GTM teacher never mentioned anything regarding the course learning outcomes in the class. Moreover, the teacher in the autonomous group, like any other teacher in the learner centered classroom, acted as a facilitator of learning instead of taking responsibility of the students’ learning. Instead of introducing certain activities in the class, the teacher asked the students to devise worksheets and activities. This added to students’ self-esteem and a healthy competition among them.

Teacher in the autonomous group would divide the class into different groups and assign different roles to the students. Some of the students were assigned the responsibility to gather material about the course topic under discussion, and explain it to the rest of the class. It was a good exercise not only in reading but also in speaking. As a result of this, teacher’s talk time considerably reduced while student talk time drastically increased. It was the students who asked questions, and teacher was there only to facilitate the learning process instead of dictating it.

Discussion of the observation data explains the reasons behind better results of the autonomous group learners. However, we decided that data from the experimental study and observation should be cross-checked with English teachers at higher secondary level. Hence, we administered a short questionnaire to the teachers to get a piece of their mind about the possibility and usability of autonomous learning in Pakistan. The results of questionnaire with the teacher are tabulated in the following section.

Table 4 English Teachers’ Attitudes to Autonomous Learning

Sr. No.	Statement	N	Mean	St. Dev.
1	It is the teacher who decides what to teach and how to teach it.	200	3.87	.92
2	The students are not mature enough to have a say in how the class is managed.	200	3.78	.435
3	Teacher should provide a list of general topics and seek students’ opinion as to which specific topics they need to pay attention to.	200	1.58	.902
4	The students can be taught to evaluate their own work.	200	1.52	.682

5	Students can be taught various learning strategies to improve their language skills.	200	1.71	.772
6	Students may feel bored but it is teacher's responsibility to continue teaching them the way s/he likes.	200	0.8	0.13
7	If the students are allowed to do what they want, most of them will waste their time.	200	4.14	.911
8	Students are motivated to learn English	200	4.31	.641
9	Using autonomous learning is practicable in Pakistan.	200	2.17	0.42
10	Students can adjust a new approach.	200	2.10	0.47

Results of the teachers' questionnaire point to the conventional wisdom and mindset that has been the hallmark of Pakistani educational system in the public sector. Data tabulated above clearly shows that the teachers believe decision making should rest with them since the students are not mature enough to have their say in whatever happens in the class. However, the experimental study data as well as the students' interviews and observation of the autonomous group class point towards a direction. Students believe that "I really feels nice when teacher assigns you some work and you get recognition upon the completion of that task." Another student remarked that teacher's role also increased with autonomous learning. The teacher not only had to motivate the students but also had to create activities so that learners could perform the roles assigned to them. One such student remarked, "Having a teacher who allows you to come up with you ideas and prepare your notes instead of making us digest lengthy pages was a wonderful idea." It was also found during class observation that the teacher's talk had decreased, and the student had got more and chances to speak, Teacher had already discussed the course outline, course learning outcomes and course objectives with the students. Based on that course outline, and following discussion with the students, the teacher urged them to pick the topics that they had interest in.

However, we see that very few teachers ($x= 1.58$) are of the view that teachers should seek students' opinion in deciding about specific issues related to their syllabus. A similar number of teachers ($x= 1.52$) seem to believe that students can be taught how to evaluate their own work or measure their own performance. Student's performance in the autonomous class helps us to reject the notion this notion as they were actively engaged in evaluation their own performance. Nevertheless the teachers do not agree.

Moreover, teachers do not correspond to the view that they should continue teaching the way they do even if the students get bored. This shows that there is a realization among the teachers that they can/have to change their approach, method or strategies in order to keep their class lively. The best way of doing that is perhaps making the students autonomous. Nevertheless, a large majority of teachers ($x= 4.14$) seems to believe that the students will waste their time if they are allowed to dictate their choices in learning process. Though the teachers claim that the students are motivated to learn English, very few of them agree that autonomous learning is suitable in Pakistani context.

Conclusion:

English Language teaching is a is quite a complex phenomenon. Simply looking at one aspect, with one angle, does not reveal the whole truth. Methodological and data triangulation is quite helpful in understanding the complexities of foreign/second language learning. A combination of the qualitative and the quantitative data enables the researcher to present various points of view, the effects of the treatment and observation of the classroom strategies employed by the teachers as well as the students. The convergence of data in this study served the following basic purposes

Firstly, findings from different sources of data were used for cross validation. One type of data was augmented with the other type and was used for in-depth analysis. The experimental study brought to light the point that the autonomous group students did better than their counterparts in the GTM group. It was no doubt a significant finding. However, it did not bring to light the techniques and strategies that the students as well as the teachers in both the group used, which resulted in the significant difference. To better understand that, we turned to the observation data. Observation of the classrooms revealed that the students taught through the autonomous learning approach took responsibility for their learning. This resulted in their better performance.

Secondly, data from one source was compared and contrasted wherever possible for a better understanding of the phenomenon. There were numerous instances of similarities in data

gathered from different sources, as explained in the preceding paragraph. However, there were, at some places, contrasts in data. The teachers believed that their approach to teaching was suitable.

Data triangulation enriched the findings from the primary source of data i.e. the experiment. Majority of the studies that seek to compare two different language learning/teaching methods use the experimental design to gauge the effect of two different kinds of treatment on two groups. However, such studies usually lack in the sense that they do not reveal the classroom techniques and strategies employed by the teachers as well as the learners. Moreover, the views of the teachers who put all the methods into practice are also quite significant. An amalgamation of all these proves fruitful for a deeper understanding of the utility or otherwise of a particular teaching method.

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