

RESEARCH METHODS FOR INVESTIGATING LEARNER MENTAL PROCESSES

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Abstract

Since the early seventies research concerns in the field of second language learning have shifted from the methods of teaching to learner mental processes in second language acquisition raising interest in language learning strategies. However, learner cognitive processes were difficult to unveil through classroom observation, the research tool once used to observe learner behaviour. Then, other techniques started to be used to capture learner thinking processes. These techniques are mainly the self-report tools, i.e. think-aloud procedures, questionnaires and interviews. The data obtained from these instruments are accounts provided by the informants themselves that are either written or verbal. They are valuable for unveiling learners' cognitive processes and consequent behaviour. Hence this paper reports the advantages of using these tools as well as the drawbacks they may carry.

1 INTRODUCTION

Research instruments in the field of language learning strategies are diverse and various, yet the most widely used ones are the self-report tools. The data obtained from these instruments are accounts provided by the informants themselves that are either written or verbal. Many researchers used self-report tools in the study of learning strategies (e.g. O'Malley & Chamot 1990, Graham 1997) for they are valuable for unveiling learners' cognitive processes and consequent behaviour, although the data are largely shaped by the informant perceptions and beliefs.

The self-report research instruments are generally put under two categories according to the temporal relationship between performance of the task and reporting on the strategies used:

Introspective research instruments: the term introspection is defined by Nunan (1992:115) as,

the process of observing and reflecting on one's thoughts, feelings, motives, reasoning, processes and mental states with a view to determining the ways in which these processes and states determine our behaviour.

This term will be used to cover the techniques wherein data collection is concomitant with the mental events being investigated such as the **think-aloud procedure**. The advantage of this data collection approach is that strategies occurring only fleetingly in short-term memory can be identified and reported. This approach is most suitable for receptive tasks or for writing, but it would be difficult to use in reporting on strategies used in speaking.

Retrospective research instruments: retrospective data are collected some time after the investigated event has taken place. Faerch and Kasper (1987) distinguish between two types of retrospection:

- *Immediate retrospection* i.e., reporting on the processes undertaken in a task that was just completed. This type of retrospection is widely used in research on speaking strategies.
- *Delayed retrospection* i.e., reporting the strategies/ processes used in a task long after it has been performed.

The tools used in retrospection are **questionnaires, interviews or diaries** that can be administered either right after the completion of the task (immediate retrospection), or a long time after the accomplishment of the task (delayed retrospection) according to the type of information required. Concerning the form of retrospective data, it can be either written as when responding to a questionnaire, or verbal as when answering an interview.

2 THE THINK-ALoud PROCEDURE

Think-aloud techniques are instances in which subjects complete a task or solve a problem while speaking about their thought processes at the same time. In other words, they let their thoughts flow verbally in a stream of consciousness fashion without trying to control, direct, or observe them. In writing for example, this experiment consists in giving a task to the subject, then ask him to verbalise all his thoughts while writing. This verbal report is recorded on a tape, then transcribed, and represents the data used by the researcher to gain insights into the learner's thoughts and writing strategies used. This technique is believed to be closer than retrospective techniques to report mental actions

because it is done simultaneously rather than thinking back on actions performed at some prior time (Nunan, 1992).

However, though think-aloud techniques seem to offer almost direct access to learners' thought processes, they have been criticised for presenting a number of problems that call into question their validity and reliability:

Firstly, the framework of thinking-aloud assumes that any information we process goes first into short-term memory before some of it is transferred to long-term memory. It is believed that during this first phase thought can be verbalised. But in tasks which we have learned to perform automatically, short-term memory will be bypassed and therefore thought processes inaccessible to verbal report (Graham, 1997). The criticism addressed to think-aloud techniques is that thought processes cannot all be verbally reported since most of them are automatic and unconscious. Therefore, resulting protocols are likely to be incomplete and of limited value.

Secondly, it is questionable whether the verbalisation process accurately reflects the cognitive operations underlying performance. In other words, whether respondents are reporting truthfully on their thoughts (Cooper and Holzman, 1983).

Thirdly, it has been objected that cognitive operations undertaken to complete a task are somehow transformed by the subject's efforts to verbalise, and the act of reporting on one's thoughts during a task may influence and change the performance of a task (Seliger, 1983). Talking while writing, for instance, is feared to divert the writer and make him more preoccupied by what he is saying than by the writing task itself. But, here again opposing views can be recorded. Ericson and Simon (1980: 226), for example, explain that thinking-aloud "*will not change the structure and course of the task processed, although it may slightly decrease the speed of task performance*". Likewise, McDonough (1995) reports that some research works on think-aloud protocols of the reading skill have shown that, in reading, thinking aloud does not affect the process but extends the time needed.

In sum, think-aloud techniques may not report all the cognitive processes undertaken when performing a task, but it can be argued that they can reflect the information that is processed in short-term memory during a normal task execution. In spite of the criticisms reported, the think-aloud protocol remains an interesting instrument to capture learners' mental processes; it has been recommended by many specialists such as Krapels (1990: 51) who emphasizes that:

Although composing research literature has questioned the credibility and validity of protocol analysis, the L2 studies that have used it have consistently mined more useful data than those studies that have not, because the data are then comparable across studies.

Nevertheless, using this research tool requires certain conditions to be met in order to maximise the verbalisation of cognitive processes. First, it is advisable that tasks be direct and not calling upon excessive powers of concentration, to make informants devote their energy to the task of reporting. Second, it is recommended that subjects receive training prior to the think-aloud procedure in order to make them aware of what is required of them. Third, some researchers further recommend to remind informants about what they should be commenting on during the reporting. However, these prompts should be carefully worded and of general nature to avoid influencing the report.

3 THE QUESTIONNAIRE

As mentioned above, the questionnaire is a retrospective instrument, which allows the researcher to determine people's attitudes and beliefs about what they want and what they believe they will do, or have done. The difference with the think-aloud procedure is that this instrument cannot tell us what learners actually do. Moreover, the questionnaire presents some drawbacks such as difficulty of making questions clear, possibility of being affected by low response rates, possibility of being completed in a rush, lack of flexibility and being a one-way instrument not allowing interaction between the researcher and the informant unlike the interview. But at the same time, it presents many advantages calling for its use such as allowing a wider sampling asking everybody the same questions, giving more time to think about answers, providing anonymity and may be proving easier to analyse and quantify results. This is why the questionnaire is a research tool widely used by graduate students undertaking classroom research.

In a questionnaire the investigator can use two types of questions:

- *Closed questions* in which the range of possible answers is determined by the researcher.

e.g. Should learning strategies be taught to primary school children?

☐ Yes

☐ No

- *Open questions* in which respondents can decide what to say and how to say it.

e.g. What do you think of the proposal of introducing learning strategy training at the primary school?

Questionnaires can consist of only closed questions, open questions, or a mixture of both. It should be noted that although closed questions are easier to collect, analyse and quantify, open questions can provide more useful information and are sometimes more faithful to the respondent's opinion.

Finally, when choosing the questionnaire as a research tool, it is important to carefully word questions. The researcher should avoid such questions as:

- *Leading questions* in which he reveals his own attitude,

e.g. Do you think that the enterprise of strategy training in primary schools is utopian and unrealistic?

- *Complex and confusing questions*,

e.g. Would you prefer a short, non-award course (3,4 or 5 sessions) with part-day release (e.g. Wednesday afternoons) and one evening per week attendance with financial reimbursement for travel or a longer, non-award course (6,7 or 8 sessions) with full day release or the whole course designed on part-time release without evening attendance?

(Cohen and Manion (1985: 105-7)

- *Portmanteau questions* where the informant is asked more than one thing at a time i.e. multiple part questions,

e.g. When did you start teaching in this school, what year groups have you been teaching and what teaching approach/ approaches did you use with each?

4 THE INTERVIEW

This is another type of retrospection which addresses the perceptions of subject students about their writing behaviour and processes because the perceptions of participants, however subjective, are a crucial means to understand their learning behaviour. In fact, the use of the interview is incited by the advantage of the interaction between the interviewee and the interviewer this instrument offers as compared to the questionnaire. While the questionnaire responses have to be taken at face value, an interview response can be clarified and developed through follow up questioning. There are three types of interviews: unstructured, semi-structured, and structured interviews (Nunan, 1992).

Unstructured / Informal interview : it is discovery oriented and guided by the answers of the interviewee rather than pre-planned questions of the researcher. This is why the direction of the informal interview is largely unpredictable.

Semi-structured / Focused interview : in this type of interview, the interviewer has a general idea of the direction of the interview and what should come out of it. The interviewer does not present a list of predetermined questions to be answered, but topics and issues to be treated giving enough flexibility for interviewees to develop areas of concern or volunteer unpredicted content.

Structured/ Formal interview : it is the most formal type of interviews. The list of questions is totally predetermined by the researcher observing the same order.

However, this instrument presents some disadvantages that may call into question its reliability. The first problem raised is the asymmetrical relationship between participants i.e. the inequitable relationship that may stem from race, gender, class, status or simply personality between the interviewer and the interviewee where the interviewer has generally much more power that may affect the content of the interview. Another problem is that respondents may be different in terms of their verbal abilities: while some informants will be skilful at providing the appropriate amount of verbal report data, at the appropriate level of specificity, others lacking this ability will be unable to provide the required information. Moreover, the data may be biased by the informant's post-event reconstruction if he has the tendency to create an account of reality which is favourable to him, to sound good, or to provide the type of answer waited from him. In addition the time-consuming nature of interviews effects the size of sampling in a study limiting generalization of results.

Nevertheless, we believe that the interview is a valuable research tool to obtain information on cognitive processes as it allows clarification and development of answers through follow-up questioning as highlighted by Cohen (1998: 38):

... research has demonstrated that verbal reports elicited with care and interpreted with full understanding of circumstances under which they were obtained, are, in fact, a valuable and a thoroughly reliable source of information about cognitive processes.

Like the questionnaire, unclear, leading and portmanteau questions should be avoided in an interview. In addition, the interviewer should pay great attention to the interviewee's answers and behaviours, to avoid talking too much, and not to interrupt the interviewee.

5 CONCLUSION

The research instruments mentioned above present advantages and disadvantages when being used, this is why the literature on research methodology highlights the importance of multiplying data sources using different types of instruments in order to diversify information sources and analyse the problem from different angles as pointed out by Weir and Roberts (1994: 137):

A combination of data sources is likely to be necessary in most evaluations because often no one source can describe adequately such a diversity of features as is found in educational settings, and because of the need for corroboration of findings by using data from these different sources collected by different methods and by different people (i.e. 'triangulation'). It is now widely held that multiple methods should be used in all investigations.

Then, using a multiple approach to data elicitation can help the researcher to have different insights into the problem and may lead him to develop different conclusions, mainly in a field of research on mental processes where it is difficult to unveil what subjects are thinking about when doing a task.

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