# Think-Aloud Protocol -- Elicitation of Strategy Use and Solution to Learning Problem

## Beena Philip. M

**Abstract**

In a fast moving world of teaching and learning, where does one find time to trace the thought processes of a learner ,and that too in teaching/learning English as a Second Language, might be the first doubt raised by an average teacher when she comes across the term 'think-aloud protocol'. This paper tries to clear the doubt by giving substantial theoretical and experimental support. 'Think-aloud protocol' is one of the techniques practiced by teachers to elicit the learning strategies used by learners, or in other words, it is an instrument of data collection administered by teachers on experimental studies.

Apart from the very basic purpose of this technique, the present paper also examines the purpose it serves in promoting self-learning and in solving learning problems to some extent, especially in a collaborative language learning and teaching context. Based on the National Curriculum Framework -2005, which envisages every learner as a constructor of knowledge, the think-aloud protocol can be considered as a better learning strategy not only in ESL learning, but in other subjects also. However, the whole process is treated as a complex cognitive skill within a cognitive-theoretical framework.

Language in India www.languageinindia.com                                                             219
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem

**Introduction**

Every teacher faces at one point of time or the other, the difficulty of meeting the needs of the learners or for finding a better way to teach a particular item. Then, how the learners learn or what strategies are used for learning or can be used for better performance becomes another side of the difficulty.

What actually goes on in the minds of the learners when they get involved in the process of completing a task? At what stage of the process do they falter or digress? Can a teacher check or monitor the mental processes and guide the learner through the correct stages to complete a task?

These were some of the questions posed by the cognitive constructivist theorists because they considered learning strategies in second language acquisition as complex cognitive skills within a cognitive theoretical framework. (Faerch and Kasper 1987; O'Malley and Chamot 1990; Macaro 2001; Mary James et al. 2006).

To know the mental processes behind learning needs collection of data about the introspective methods in second language learning; and think-aloud procedure is one which was first adopted by Grotjahn (1987) and Feldman and Stemmer (1987), when they combined a variant of the Cloze test (also known as C-test—deleting every second word instead of every ninth word in Cloze test) and think-aloud approach, to elicit the respondent's knowledge of structural rules in second language acquisition. Since then, this procedure has been used by researchers as an effective tool to collect data about strategy use.

**Investigating the Learners -- Acquiring the Tools of the Trade**

Writers such as Jannie Rees-Miller (1993) and Kellerman (1991) believed that strategy training in ESL need not improve language learning , saying learners have already developed strategies from their experience of learning their first language. But our experience shows that second language learning is far from being universally successful even within the same classroom and with the same teacher. So, one must rethink seriously about the use of strategies in learning and its effectiveness in solving certain problems of learning.

Macaro (2001) restates two tenets of his research in learning strategies as:

> 1. Learners will learn better if they are helped to identify the strategies they use, if they come into contact with other possible strategies and if ways of deploying them in combination are suggested.

> 2. Teachers need to know the strategies that their learners are using in order to better understand some of the problems they may be encountering with their language learning and in order to be able to adapt their teaching styles and materials to the learners' needs.

Language in India www.languageinindia.com 220
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem

Macaro (op. cited) says that there are two ways in which we can find out what strategies our learners are using:   we can *ask* them and we can *observe* them ( p.43-44).

Diaries and questionnaires are two important tools of data collection which will come under what we can *ask* the learners. Whereas think-aloud protocol is the tool we use to find out the strategy use by *observing* the learners. O'Malley et al.(1989), Bacon (1992) Nyhus (1994) and a few others tried somewhat similar ideas to know about the learners' thoughts while reading and listening.

Macaro defines this tool as: This is a process of articulating one's thoughts and actions as one are carrying them out. This is usually called a think-aloud protocol (p.60).

Faerch and Kasper (quoted in O'Malley and Chamot ) distinguish three distinct types of data collection along this dimension:

> (1) *simultaneous introspection*, or concurrent performance of the task and reporting on the strategies used;

> (2) *immediate retrospection*, or introspection about a task that was just completed; and

> (3) *delayed retrospection* or analysis of strategies used with previously completed tasks.

Simultaneous introspection occurs with think-aloud tasks, where the informant is asked to report on the strategies being used while the task is being performed. The advantage of this data collection approach is that strategies that occur only fleetingly in short-term memory can be identified and reported. This approach would be suitable for receptive tasks or for writing, but would be difficult to use in reporting on strategies while speaking (OMalley and Chamot 1990 : p.90).

The possibility exists that simultaneous introspection will change the nature of the thought processes so that the informant is reporting a modifying version of what actually occurs while thinking.

Ericsson and Simon (1987) distinguish  between a "talk-aloud" data collection procedure and "think-aloud". In the talk-aloud procedure, the verbal reporting of the informant is expected to parallel the thought processes, as in performing simple arithmetic or solving a problem in logic.

The respondent is reporting on information that is needed to solve the problem as it enters into short-term memory. In this case, silent thought would be no different from overt thought processes and may in fact occur within roughly the same time frame as silent thought processes.

**The Think-aloud Procedure**

Language in India www.languageinindia.com                                221
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem

In the think-aloud procedure, however, the informant encodes the mental processes immediately after they occur and then takes time to describe them to the investigator. Thus, the description is not contemporaneous with the problem solution process, and overtly describing the problem solution takes longer than solving comparable problems silently.

This description of think-aloud procedures characterizes data collection with second language acquisition in which informants describe each strategic steps in learning or comprehending information immediately after it occurs. Respondents are typically intercepted at various points as they are listening and asked to describe what they were just thinking rather than asked to perform a task simultaneously while reporting on their thought processes. The critical point with think-aloud procedures is that the mental processing the informant reports on is still accessible in short-term memory (O'Malley and Chamot, pp. 88-91).

**The Procedure**

The normal procedure for eliciting the data from a think –aloud protocol is to take the following steps:

1. Provide a student with a task and ensure that they understand what they have to do to accomplish it.

2. Find ways of making them feel at ease.

3. Explain that you want them to articulate their thought processes and the strategies that they use while they are actually carrying out the task.

4. Demonstrate how this thinking aloud process can be done by doing some of it yourselves (with a similar task).

5. Start recording.

6. Start the student off.

7. Prompt the student if they are not articulating their thoughts and actions sufficiently.

8. Prompt but avoid phrases like "Are you sure?" and "That's good". Instead ,use only phrases like :"What makes you say that?";"What made you do that?";"What are you thinking at this moment?";"Please keep talking."

9. Listen to the recording of the think-aloud process (after the session) and make a list of all the strategies used by the student.

Language in India www.languageinindia.com 222
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem

10. Look carefully through the results of the task (after the session).What features of it might have been improved by better (or more frequent) strategy use?

**Some Limitations**

As discussed before, thinking aloud in an L2 task will not get as close to the real thought process as working through an arithmetic problem out loud. So, when we follow the steps we may come across some limitations like: the mental fear students may have, thinking aloud activity may appear alien to them, they might have formed preconceptions about the strategies, problem of articulating the strategies etc.

When we look at an extract from Lingua study, the limitations become clearer:

(Amanda reads a hand-written French letter)

> **Amanda**: It's to, er . . . that's their name, and I'm not quite sure what it is . . . is that a brochure that someone's sent them? Or it could be something to do with a letter.*Vacances* . . . that's holiday to some region and that could be the region or the name of the town.
>
> **Teacher**: What makes you say that?
>
> **Amanda**: Er, cos the French have things backwards usually and they say that (*pointing to text*) in front of that, so he's been on holiday to a region there, that looks like a town . . . It's a small apartment but it's ok . . .
>
> **Teacher**: What makes you think that?
>
> **Amanda**: *Agreable(pronounced the French way)*, it's alright . . . is that children adore?... children like …
>
> **Amanda**: There's practical activities and sports but some of them are difficult *aller  dans les villages*  …they go to the village …
>
> **Amanda**: … that could be glasses, maybe, spectacles, or something nice to see.
> (Quoted in Macaro p: 92)

When we analyze Amanda's strategy use we can infer that:

1. She has doubt about her interpretation ("I'm not quite sure") and she asks questions ("Is that a brochure?") which later she may be able to confirm or discard.

2. She thinks about the overall look of the text in terms of writing conventions.

Language in India www.languageinindia.com                                                                223
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem

3. She too looks for cognates but, again, she asks questions about the text, casts doubts on her interpretation ("That could be the region").

4. She is aware of aspects of French grammar and word order ("The French have things backwards"), this may be a bit of a generalization on her part but she is right and she is using what she has learned about the language to help her make sense of it.

5. She focuses both on the cognate (*appartemen*t) and prior knowledge (*agreeable)*  but she also makes links according to what makes sense ("it's small but ok").

6. From the transcription one also gets the impression that she is hopping backwards and forwards in the text to check that things make sense by in- text evidence elsewhere .

7. She decides to skip the difficult phrase '*il y avait un maitre nageur de servi ce'*  and samples the next string of word that make sense at the gist level "practical activities and sports but difficult" …

8. "They go to the village"---although she hasn't quite got the first person plural right, she has got the sense that it's "they" from the rest of the text.

9. "That could be glasses"—she is tempted by the cognate but holds on to a doubt long enough to make her come up with a more plausible (from the context) possibility. (Quoted in Macaro, 2006:94)

**The Language of Thought**

What is the language of thought that is employed when the learner is involved in a language process and what is the language of thought that the learner uses in order to apply, monitor and evaluate strategies like the one that has been discussed?

As Andrew Cohen speculates: "The very choice of language of thought may have significant implications for ultimate success at learning, using as well as forgetting a language" (1998:157). Richard Kern (1994) used interviews and think-aloud protocols on 51 intermediate level (university) students of French.

This led him to identify a number of disadvantages and advantages of making L1 /L2 connections when reading. First, Kern concludes, mental translation may lead to inaccuracies and miscomprehension if the lexical item is wrongly connected to the L1 equivalent. This is likely to happen particularly with 'false friends'.

Second, bottom-up de-coding (word-by-word translation) may not assist with the integration of meaning .The learner cannot see the wood for the undergrowth, let alone the trees. Third, the comprehension activity may actually stop at comprehension.

Language in India www.languageinindia.com                                                              224
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem

Once the meaning has been identified by the learner , they will move on quickly thereby focusing attention for too short a time on the L2 forms on the page and reducing the possibility of noticing something new. In other words, comprehension may not lead to the intake of new language. Considering the advantages of thinking in L1 when attempting a reading task,

Kern concludes that use of the L1 helps with semantic processing (with the storage of meaning) and permits consolidation of meaning. The L1 helps with chunking (grouping) L2 lexical items into semantic clusters, a way of attempting to reduce memory constraints. The L1 helps with thought- processes (the train of thought) and avoids loosing track of the meaning as the reader works through a text because the L1 logically puts less processing load on the working memory.

The reader's network of associations can be made richer with L1 use simply because activation of connected ideas will have been going on for many more years. In this way, therefore, the L2 meaning will be better integrated and assimilated. The input is converted into more familiar terms, thus enhancing the readers' confidence and lowering affective barriers.

Mental translation may help in clarifying the syntactic roles played by lexical items (by contrasting the L1 with the L2) to verify a verb tense or checking for comprehension. Other authors like Ian Campbell (1997), Nina Spada and Patsy Lightbown (1999) and Andrew Cohen (op. cited) support Kern when he advocates the strategy of 'proceeding from the known to the unknown'.

**A Solution to Learning Problem?**

The think-aloud protocols we discussed have two- pronged benefits: to learners, it helps them to identify the strategies they use; to teachers, to adapt their teaching styles and materials to the learners' needs. The limitation of this procedure—only one student at a time and spending a lot of time on each - actually becomes beneficial to the learner as he gets individual attention and a chance to know different strategies to be used for listening ,reading and writing.

If tried in a collaborative learning classroom, the effect of this technique would be amazing. In groups when they work on a task, left on their own, they start thinking aloud the different strategies to understand, to pronounce, to retrieve, to compare, to contrast, to correct, to review, to analyze, to group, to associate, to elaborate etc. etc.

Experienced teachers, if they had listened to their learners in group-work, might have come across comments like: 'read it again', 'use the past tense ,you started with one', 'this does not make sense at all', 'don't you remember what she said about using the present for future?', let's put it this way it's more clear', 'why don't you look up this word ?', 'let's note the important points first' and a number of talking-aloud and thinking-aloud from the groups.

Language in India www.languageinindia.com                                                                 225
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem

Good learners may not benefit much from groups, but their social strategies develop and the long term memory also gets enriched. Thus, the practice of this strategy results in better understanding of oneself or, in other words, leads into a process of introspection and finally makes learners approach learning as problem solving . Ultimately, these practices help learners in the development of critical thinking, construction of knowledge and reflection which are envisaged by the National Curriculum Framework 2005.

**Conclusion**

Teachers have to apply strategies of different types; have to adopt different strategies for different groups; have to change the strategy if it doesn't work; but, cannot escape from using them. As years pass by, the learners change, their attitudes vary, the needs are many, the theories confute, the curriculum gets modified, the exams and marks vanish, the role of the teacher can be anything but teaching, and so, any innovative move from the part of the teacher is desirable.

Then, think-aloud protocol should be used as one of the strategy elicitation techniques to know how learners think as they learn .When the learners undergo this procedure, they realize how to go about reading comprehension, listening and writing in a better way.

**References**

**Bacon, S.M. (1992)** The relationship between gender, comprehension, processing strategies, and cognitive and affective responses  in foreign language learning .*The Modern Language Journal, 76, 2, 160-75.*

**Campbell, I.(1997)** A question of language awareness: using English to support second language learning, *Babel(AFMLTA)(Victoria),Australia, 32, 2, 10-13.*

**Cohen, A. (1998**) *Strategies in Learning and Using a Second Language,* London: Longman

**Ericsson , K.A. and Simon,H.A. (1987)** Verbal reports on thinking, in G.Faerch and G.Kasper (eds) *Introspection in Second Language Research,* Clevedon: Multilingual Matters, 24-53.

**Faerch , G. and Kasper,G.(1983)** *Strategies in Inter Language Communication.* Harlow:Longman.

**Feldman,C., and Stemmer,B. (1987)**Think-aloud a retrospective… approaches? In C. Faerch and G Kasper (Eds.)*Introspection in Second Language Research .*Clevedon :Multilingual Matters .

Language in India www.languageinindia.com                                                                226
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem

**Grotjahn ,R.(1987)** On the methodological basis of introspective methods. In C.Faerch and G. Kasper (Eds.),*Introspection in Second Language Research.* Clevedon,U.K.:Multilingual Matters.

**Kellerman ,E.(1991)**Compensatory strategies in second language research :a  critique, a revision, and some implications for the class room, in R. Philipson et al.(eds.)  *Foreign and Second Language Pedagogy Research*, Clevedon: Multilingual Matters.

**Kern,R.G.(1994)** The role of mental translation in second language reading, *Studies in Second Language Acquisition,* 16, 4, 441-46

**Macaro,E.(2001)**_Learning Strategies in Foreign and Second Language Classroom._ Continuum: London and New York

**Mary James et al. (2006)** *Learning How to Laern, Tools for schools*. Routledge: London and New York.

**Nyhus, S.E. (1994)** *Attitudes of Non-native Speakers of English Toward the Use of Verbal Report to Elicit their Reading Comprehension Strategies ,*Plan B Master's Paper, Department of English University of Minnesota, Minneapolis.

**O'Malley , J.M. and Chamot, A.U. (1990)** *Learning Strategies in Second Language Acquisition.* Cambridge: CUP.

**Rees-Miller, J. (1993)** A critical appraisal of learning: theoretical bases and teaching implications, *TESOL Quarterly*, 27,4,679-89.

**Spada, N. and Lightbown, P.M.(1999)** Instruction, first language influence and developmental readiness in second language acquisition, *The Modern Language Journal*,83,1, 1-22.

Beena Philip. M.
Govt. Higher Secondary School
Azchavattom

Language in India www.languageinindia.com                                                                 227
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem

Calicut-673007
Kerala, India
noonebeena@gmail.com

Language in India www.languageinindia.com                                                              228
10 : 2 February 2010
Beena Philip. M.
Think-Aloud Protocol – Elicitation of Strategy Use and Solution to Learning Problem