Language Skills of 5th Grade Pupils in Burundi
During the Learning of Mathematics in French:
Linguistic and Gestural Indices

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Abstract

This article presents a study on the evaluation of the language skills of pupils in 5th fundamental year in Burundi in Mathematics. The behavioural indices of the pupils in oral and written comprehension and expression revealed that their main weaknesses were in oral and written expression. In the absence of oral formulation of their own ideas, some pupils limited themselves to answering in one word or in incomplete sentences while others preferred to remain silent or to express themselves in Kirundi. In listening comprehension, they had no problem. They answered the questions and performed the tasks they had been given orally in French. In reading comprehension, they also managed to appropriate the useful information read.

Keywords: Non-Linguistic Disciplines, listening and speaking, reading and writing, Mathematics lessons

¹ The data in this article come from Wenceslas Sinabajije's thesis under the supervision of Professor Melchior Ntahonkiriye (University of Burundi, Faculty of Arts and Social Sciences, Department of French Language and Literature) and Professor Margaret Bento (University of Paris, Faculty of Humanities and Social Sciences)
1. Introduction

In Burundi, Mathematics is taught in Kirundi, the mother tongue, from the first to the fourth year of fundamental school, and in French, the second/foreign language, from the fifth year. In this article, we will show the results of the evaluation of the degree of comprehension and oral and written expression of French of the pupils of 5th year in Mathematics sessions. Mathematics was targeted because it has more lesson sessions than the other Non-Linguistic Disciplines (henceforth, NLD) which focus on knowledge and skills. On the other hand, Practical Agricultural Work, Practical Work and Home Economics, Plastic and Musical Expression and Physical and Sports Education are practical disciplines. For the latter four NLD, there are no pupil books or subject content to be put in the pupils' notebooks. During their sessions, pupils are mainly asked to perform tasks without any obligation to express themselves. Mostly, the pupils speak to each other in their mother tongue. On the other hand, during the Mathematics lessons, they have to express themselves as often as necessary in oral and/or written form according to the requirements of the decision-makers of the Burundian education system and with reference to the constitution [7]. However, the results of the evaluations prove that the pupils have a low level in French. Indeed, according to the authors of the initial teacher training booklet, "after four years of learning this language, [the pupil] still cannot really communicate [...] when asked a simple question, he is unable to answer, either because he does not understand or because he cannot formulate the answer in French. The situation becomes even more problematic for him when it comes to reacting to the ideas expressed by others or expressing his own [11]. The pedagogical reports of the local supervisors and the comments of some educational partners reveal that the pupils do not master French. Research on this problem in Burundi is very rare. Those carried out by Ntwari [10], Nduwingoma [8; 9] and Docile [4] concern the 4th cycle (7th, 8th and 9th year) while that of Folny [7] focuses on the evaluation of teachers' skills in the 3rd cycle. Most of the productions focus more on the difficulties encountered by teachers in French than on those of pupils. For the 5th year class, the authors of a teacher's booklet state that pupils who are taking up NLD for the first time in French have difficulties in oral and written comprehension and expression because they do not yet have sufficient grammatical and lexical knowledge [12]. As there is no scientific research on the analysis of language skills (of pupils in the 5th fundamental year in Burundi), we wanted to know to what extent they understand and use French during the mathematics sessions. The final idea is, based on some clues, to identify the competences or lack of competences of the pupils in understanding and producing in French in order to have a better knowledge of the difficulties experienced during the learning of Mathematics.

2. Methodology

This research was based on class visits in the 5th basic year in order to observe the progress of the Mathematics lesson sessions. An observation guide was used as an
instrument for data collection. It consisted of sections for the description of pupils' actions and behaviour during the lessons. Thus, the aspects that attracted our attention were listening comprehension, speaking continuously, speaking in interaction, reading comprehension and writing. We sought to understand and describe the extent to which French is understood and used by pupils in Mathematics lessons. The class of 5th was targeted because it is the level at which the implementation of the transition from Kirundi to French begins. As mentioned in the introduction, French becomes the new language in which all the NLD are learned. Knowing that the aim of the observation was not focused on statistics but on understanding the situation, the number of schools to be visited was not determined in advance. It was known at the time of the survey according to the specialists' theory. Indeed, according to Fortin and Gagnon [6], "the standard that sets the sample size is the achievement of data saturation, which occurs when the researcher realizes that no new information is being added. In the planning stage, only the schools to be visited were identified. The criteria for their choice were accessibility and heterogeneity of backgrounds to reach pupils from various strata of society. In all, thirteen mathematics lessons were observed in thirteen schools in eight Communal Direction for Education and five Provincial Direction for Education.

The language skills observed in the lessons are the same as those indicated in the textbooks. These skills are listening, speaking continuously, speaking in interaction, reading and writing [5]; [2]. Can a pupil's understanding of a lesson be assessed by observation? Of course, when a pupil responds to a teacher's prompt, but this does not concern the whole class, or during interactions in group work. Another way is to note the body language of the pupils during the sessions. Gestures can be classified into three main categories according to their use: self-focused gestures aimed at personal well-being; practical gestures aimed at everyday actions; and communicative gestures aimed at social interactions. Within these communicative gestures, two other categories can be identified, coverbals and emblems [3]. The former is always accompanied by speech. Their interpretation depends on the latter (facial mimics, changes in posture, etc.). The latter are conventional. They replace speech, such as nodding to say that one has understood and raising one's finger to ask to speak. It is this last category that interests us in particular in this study. The raising of the hand is one of the operative signals of understanding on the part of the pupils, or at least of the feeling of understanding, insofar as they give an indication to the teacher [3]. In Burundi, when pupils are questioned collectively and they know the answer, they show their desire to answer by raising their hands. When many pupils know the answer, they often snap their fingers to attract the teacher's attention. Thus, the indices of comprehension and expression of French retained are both the oral and written productions of the pupils, but also the raising of hands.

At the end of the survey, we collected observation note cards completed by hand lesson by lesson. Indeed, according to Andreani and Conchon [1] "the observation notes are written and transcribed according to a restitution approach and not on an
exhaustive account. Their aim is to retain what the observer saw, what he or she felt, what impressed him or her and what surprised him or her”. This phase was followed by the transcription of the data. Thus, files of observation notes were recorded one by one on a computer according to the lesson. Their text extracts were analysed using the content analysis method [1] and according to an elaborated analysis grid.

3. Findings and discussion

The observation of thirteen Mathematics lessons provided tangible evidence related to the degree of understanding and expression of pupils in French. Before their analysis and comments, the results obtained are presented in tables according to the targeted competences.

3.1. Listening comprehension

To show whether or not pupils understood information, instructions and/or oral questions from their teachers, the clue we observed in thirteen Mathematics lessons was the raising of the hand or finger to be pointed at by the teacher (see Table 1).

<table>
<thead>
<tr>
<th>Indices</th>
<th>Language of access</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raising hands and performing the task</td>
<td>French</td>
<td>9 of 13 lessons</td>
</tr>
<tr>
<td>Raising hands and performing the task</td>
<td>Kirundi</td>
<td>3 of 13 lessons</td>
</tr>
<tr>
<td>Neither raising the hand nor performing the</td>
<td>French</td>
<td>1 of 13 lessons</td>
</tr>
<tr>
<td>task</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In nine out of thirteen lessons observed, the majority of pupils raised their hands and carried out instructions to follow up information received in French. In three lessons, pupils raised their hands and performed tasks after translation into Kirundi or when teachers spoke in Kirundi. In one lesson, pupils did not raise their hands and did not carry out the instructions when they had information in French. We can note that the raising of the hand and the execution of tasks are indications of the oral comprehension of information received orally in French. In the majority of the lessons observed (nine out of thirteen), the pupils did not have any difficulty with oral comprehension. However, in four lessons, pupils only reacted when their teachers used Kirundi, otherwise they remained inactive.

3.2. Continuous speaking

Pupils were expected to speak continuously when justifying or defending individual answers. In other words, continuous speaking corresponds to individual speaking. The pupil was expected to address the teacher and classmates. The following table (no. 2) illustrates the results obtained:
Table 2. Indices of continuous oral expression

<table>
<thead>
<tr>
<th>Indices</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answers in incomplete sentences or in one word</td>
<td>6 of 13 lessons</td>
</tr>
<tr>
<td>Answers in full sentences without explanation</td>
<td>6 of 13 lessons</td>
</tr>
<tr>
<td>Answers in very short sentences</td>
<td>1 of 13 lessons</td>
</tr>
</tbody>
</table>

In six out of thirteen lessons, we found that pupils gave full sentence responses without comment. In only one of the thirteen lessons were pupils' sentences very short. In the remaining six lessons, pupils formed incomplete sentences or gave one-word answers. From these indications, we can say that the pupils were not able to express themselves orally in a continuous manner. They were unable to make comments, give enough ideas or rich explanations because of their low level in French. When answering questions, they used only one word or gave a part of the answer. This means that pupils were not familiar with answering by repeating part of the question.

3.3. Speaking in interaction

In order to follow the progress of the interactive speaking activities, it was planned to attend the pupils' group work. During the thirteen Mathematics lessons, the pupils' interaction with each other was not planned. In fact, interaction between pupils was not encouraged. It could have taken place in the group work. However, group work was never organised. Group work could have helped pupils to become familiar with the use of French if teachers had organised it with appropriate activities and instructions.

3.4. Reading comprehension

As regards reading comprehension, we observed indicators showing that pupils did or did not locate information formulated in French in writing through statements and/or instructions. These are the execution of tasks and written productions (see Table 3).

Table 3. Indices of reading comprehension

<table>
<thead>
<tr>
<th>Indices</th>
<th>Proportions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locating data and completing tasks</td>
<td>10 of 13 lessons</td>
</tr>
<tr>
<td>Producing answers to written questions</td>
<td>3 of 13 lessons</td>
</tr>
</tbody>
</table>

We had two findings. In ten lessons out of thirteen, pupils were able to locate data and perform operations. In three lessons, they were able to produce answers to written questions. In our opinion, the pupils did not have any difficulty in reading comprehension because the procedures for using the mathematics lesson material are almost the same in Kirundi and in French. Pupils were used to noting useful information in Kirundi. They were able to note down the numbers, the unknowns, the instructions and the formula to be used. In spite of this, teachers keep saying
that pupils do not understand mathematics statements and instructions written in French. Our results did not confirm this, as there were indications that the pupils solved the problems submitted without difficulty.

3.5. Written expression

During the thirteen sessions of Mathematics, pupils did not have opportunities to carry out any written production activities. No activities that encourage pupils to express their own ideas by writing their answers were offered by teachers. Pupils wrote in six out of thirteen lessons when they were performing operations on the board. In eleven lessons, they wrote during application exercises which consisted of performing mathematical operations. Pupils' written expression in French therefore did not take place during the lessons observed.

To summarise, like the authors of the initial teacher training booklet [12], we found that pupils had difficulty expressing opinions, giving arguments, explaining facts or describing events, asking questions and responding to instructions in mathematics. The results did not confirm their statements in relation to not understanding mathematical instructions and statements. Their difficulty was in giving their opinion and expressing their ideas. The special contribution of the study is that of having illustrated the assessments of the pupils' language skills with observable clues in the process of communication in Mathematics lesson sessions. In the end, the results obtained after this observation confirmed that the pupils visited had a low level of French not in all its aspects but in oral and written expression.

4. Conclusion

Based on testimonies questioning the level of French of pupils in the 5th fundamental class, where the teaching of NLD changes from Kirundi as a mother tongue to French as a foreign language/second language, we carried out a study during which Mathematics lessons were observed. The aim was to identify indicators of the mobilisation of pupils' language skills in Mathematics sessions. Notes were taken using an observation guide. Analysis of the data and interpretation of the results revealed that the pupils had few problems with listening comprehension. They raised their hands and performed tasks to follow up on information received in French. In reading comprehension, pupils were able to locate data, perform operations and produce answers to written questions, among other things. They had no difficulty in understanding the information read. However, the results showed that they had a problem in oral and written expression. In continuous speaking, they could not individually provide ideas or arguments in French.
References


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