



# From Object to Instrument for Language Development in Kindergarten: Necessary Support in the Development of Professional Competence Among Probationary Public School Teachers

Émilie Magnat, Karima Olechny

## ► To cite this version:

Émilie Magnat, Karima Olechny. From Object to Instrument for Language Development in Kindergarten: Necessary Support in the Development of Professional Competence Among Probationary Public School Teachers. Joël Bisault; Roselyne Le Bourgeois; Jean-François Thémimes; Mickaël Le Mentec; Céline Chauvet-Chanoine. Objects to Learn About and Objects for Learning 2: Which Teaching Practices for Which Issues?, ISTE, pp.61-78, 2022, 978-1-119-90216-4. 10.1002/9781119902171.ch4 . hal-03930830

**HAL Id: hal-03930830**

**<https://hal.science/hal-03930830>**

Submitted on 15 Apr 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Émilie MAGNAT and Karima OLECHNY  
Université de Picardie Jules Verne (Amiens)

## Chapter 4

From object to instrument for language  
development in kindergarten: necessary  
support in the development of  
professional competence among  
probationary public school teachers

## 4.1. Introduction

Using<sup>1</sup> objects to perform tasks is ingrained in our lives: it seems perfectly normal to pick up cutlery to eat or a pen to take notes. Depending on the type of knob on a door, for example, everyone knows whether they need to press or push, if they have been through that kind of door before. Some objects have functions that may be obvious to the user, but this may vary from person to person depending on their education and their experiences.

In the context of school, classes are so rich in diverse and varied objects that outsiders might see rather a jumble where an educational professional would see the full learning potential, and two professionals would not see the same potential. With the democratization of Information and Communication Technologies for Education (ICTE), new objects are making an appearance, such as computers, digital tablets etc. (Zaid *et al.* 2019) and through them, the number of objects "present" in class is increasing exponentially. This development, which could be seen as a springboard to action, also involves good management of all these objects along with didactic consideration of the synergies between the objects selected with a view to a precise learning objective.

Our research is inscribed within this context and focuses more specifically on objects for language<sup>2</sup> in kindergarten and the process which probationary public school teachers go through in terms of utilizing these objects.

## 4.2. From object to instrument for language in kindergarten

The mere presence of an object in the school context is not a guarantee of relevance to teaching-learning, a notion that we like to use with a hyphen to reflect the systemic dimension in the school situation.

### 4.2.1. From educational object to instrument

In an instrumental approach, we consider objects as "anthropotechnical objects", or in other words "thought out, designed according to a human environment" (Rabardel 1995, p. 9). An object takes on its full meaning when it is used in a

---

Chapter written by Émilie MAGNAT and Karima OLECHNY

<sup>2</sup> According to the syllabuses currently in force in France, "The word 'language' designates a set of activities carried out by an individual when (s)he speaks, listens, thinks, tries to understand and, gradually, reads and writes" (French Ministry of Education Circular MEN 2015, p. 6). In this case, we are focusing on listening and speaking.

specific context for a specific purpose. Moving from the definition of the purpose to the choice of the appropriate object with a precise use requires the teacher to apply his/her previous knowledge and to project him/herself.

The use of objects for teaching-learning pre-dates by far the arrival of digital technology in the classroom. One often thinks of the "lesson from things" (*leçon de chose*) from the late 19<sup>th</sup> century, in which an object served as an entry point into the understanding of a concrete or abstract phenomenon. The shift to the use of digital "objects" and research work around open and distance learning (ODL) have led researchers to state that "[t]he concept of the Learning Object (LO) [which] initially appears when there is a need for resources to be archived, with granularity and meta-information that allows reuse" (David 2003, p. 1). Even if "[t]he problem of the clear definition of learning objects is far from being solved" (Bourda 2001, p. 79), we propose to make a detour via the definitions conceived in research into Human-Machine Interaction (HMI) to clarify the contours of an "object" (whether digital or not) in a teaching-learning situation.

Pernin defines the learning object as follows:

“A Learning Object is a digital or non-digital, abstract or concrete entity that can be used, reused or referenced during training. There are three main classes of learning objects: Learning Units which allow training to be structured and organized in space and time; Educational Activities which define the precise methods of acquiring, validating and communicating one or more elements of knowledge; and Teaching Resources, physical or digital, necessary for carrying out the activities” (Pernin 2003, p. 27).

In this case, we are primarily considering the third category, namely the educational resources which serve as a basis for the activity, the activity in our context being language work.

Bourda (2001, p. 72), for his part, recalls the metaphors commonly used to talk about learning objects, namely the LEGO® set which involves bricks to be put together to obtain "constructions that stand up and sometimes don't" and the idea of atoms which "cannot combine with no matter which atom in no matter what way and [which involves] a minimum level of knowledge to assemble them". These metaphors highlight the fact that it is not only a question of arranging the objects in front of the learner, but that it is indeed necessary to think of the synergies between the various objects which one proposes, and to do so in accordance with the stage of learning (didactic alignment).

Finally, it is worth noting that in French literature the term *Object Pédagogique* (lit. Pedagogical Object) is often used as a translation of the term Learning Object

(Bourda 2001, p. 71; David 2003, p. 4; Pernin 2003, p. 2). On this point, David (2003, p. 4) correctly points out that it would be much more pertinent to use the translation "*objet d'apprentissage*" (lit. learning object). We agree with this point of view because the term "*objet d'apprentissage*" would make it possible not to be confined to the teacher's perspective on the objects, but to also include the perspective of the learner who can also see the potential of an object.

The perception of an object's potential derives from its affordances. Although there is still debate around the meaning of the word affordance (Scanlon 2010, p. 5), this term has the advantage of taking into consideration both the user and the context of use (Conole and Dyke 2004). It relates to the properties of an object when these are perceived by a user. These can vary from one person to another because each person is conditioned in the perception of affordances by his or her own physical and psychological capacities (see the works of Kennewell 2001 and Kirschner 2002). It should be noted that affordances do not cause action, they simply allow it (Kirschner 2002, p. 13).

As soon as the object has affordances, is associated with uses, we can speak of an "instrument". As Rabardel (1995, p. 11) stated, the issue is the combination of "a material or symbolic artifact produced by the user or by others" and "one or more associated patterns of use arising from a person's own construction or the appropriation of pre-existing social patterns". The patterns of use, resulting from the Piagetian approach, are functions attributed to an object by the user(s) and are also specific to each situation. In this process towards the instrument, called instrumental genesis (Rabardel 1995), the user can progress via instrumentalization or instrumentation, defined as follows:

"Instrumentalization processes are directed towards the artifact: selection, grouping, production and the institution of functions, diversions, attribution of properties, transformation of the artifact, of its structure, of its functioning etc. ... going as far as full production of the artifact by the subject;

Instrumentation processes are related to the subject: to the emergence and evolution of patterns of use and instrumented action: their constitution, their evolution through accommodation, coordination and reciprocal assimilation, the assimilation of new artifacts to already-established patterns, etc." (Rabardel 1995, p. 12).

In agreement with the work of Rabardel, we consider that when the teacher has recourse to objects to promote learning, these objects go through an instrumental genesis in which patterns of use are associated with these artifacts. This process can

be conditioned by the teacher's experience and / or the directives imposed on him/her, which determine his/her use of objects in his/her teaching methods.

Drawing more upon the contribution of ergonomics, let us point out that the teacher is in a work situation and that his/her equipment may come from other people who place these objects at his/her disposal, as “proposals of instruments” (Cerratto Pargman 2005). In this case, the person who provides the equipment - who can be considered a prescriber - imagines the use that could be made of these objects and the teacher - an actor in the teaching-learning situation - imagines how (s)he could use this object or interprets the instructions given by the prescriber. In both cases, the vision of the teacher (the operator) is not necessarily in complete agreement with that of the prescriber. There is then a redefinition of the task (Leplat 1997) since the teacher rethinks his/her task in view of his/her experience, the work context and the objective being aimed at. This redefinition of the task is guided by the “agent's representations”, in other words what seems to the agent to be the normal thing to do, and corresponds to “what he proposes to do” (Leplat 2000, p. 17). We then consider the teacher's actual activity, which may be out of step in terms of the task.

In the present study of the objects used by probationary public school teachers for language work in elementary school in France, we find objects that could be considered as part of the “classic panoply”, valid for all teachers intending to do language work with their pupils. Our interest is focused not on the objects themselves, but on the process by which the probationary public school teachers and their students are led to transform them into instruments.

#### ***4.2.2. A consideration of objects, a key stage in the training of school teachers***

Many probationary public school teachers initially think that there is a kind of list of objects that must be used and that their usage is obvious. These ideas were challenged during the course of the year 2018-2019 as part of a multi-skilling project at the Ecole Supérieure du Professorat et de l'Éducation (ESPE), Beauvais. This is a teaching unit within the MEEF masters' degree for school teachers which allows students to approach multi-skilling through a multi-disciplinary project.

Supervised by two trainers, 10 probationary public school teachers worked in groups on the use of objects (presented below) for language development in kindergarten, in both French and English. During the five sessions at the ESPE (15 hours) the probationers carried out a didactic analysis of the learning materials before creating and then testing objects that had become instruments in two pre-

kindergarten and kindergarten classes (52 students) in a demonstration school in Beauvais.

In this project, whose main objectives were the manipulation of language, the pupils expressed themselves in French but were also exposed to English and were able, to a lesser extent, to produce formulations in this language. In preparation for the probationers' arrival at the school, the teachers of the two kindergarten classes had worked on the picture book *La Moufle* by Florence Desnouveaux and Cécile Hudrisier (2009)<sup>3</sup>. In the work carried out in class during three didactic experiments, the student teachers proposed activities in French and in English alternatively, around the same theme.

On first contact, the pupils began by singing "*L'Araignée Gipsy*" ("The Itsy Bitsy Spider") to the probationers, in French. In response, the student teachers sang the nursery rhyme in English. The probationers then proposed reading, in English, the picture book *The Mitten* (the English version of *La Moufle*, translated by Phyllis Roome). The nursery rhyme and the picture book thus served as entry points into the topic and its appeal.

The object-handling workshops that followed the reading in English were planned by the student teachers and could be supervised, part-supervised or unsupervised. The learning objects used in these workshops were as follows:

- Sequential images:

---

<sup>3</sup> See the Maternelle Bambou website <http://maternelle-bambou.fr/la-moufle-desnouveaux-hudrisier/> [Viewed March 5 2020].



**Figure 4.1.** Sequential images from the story *La Moufle* (The Mitten)

These sequential images, stand-alone objects that pupils can physically handle and place where they wish, were used to enable the pupils to reconstruct the chronology of the story. Although they can be of interest, used individually, in this learning situation, they were envisaged as only making sense when linked together.

- Flashcards / illustrations representing each character:



**Figure 4.2.** Flashcards of the characters of *La Moufle* [Illustrations from *La Moufle*, Cécile Hudrisier © Editions Didier Jeunesse, 2009]

These flashcards were used to memorize the names of the characters, in both French and English.

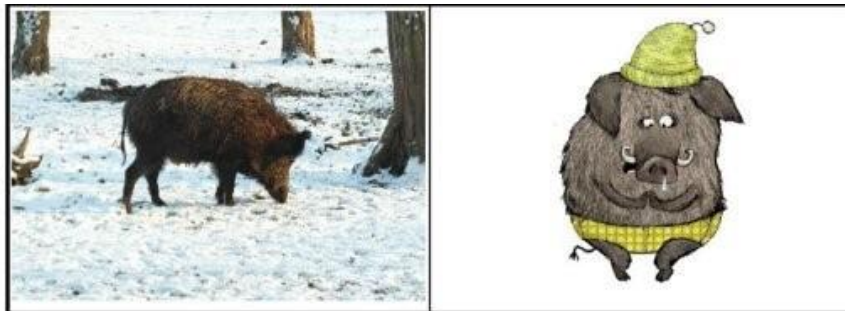


- Clay, along with a guidance sheet, to make the characters in the story:



**Figure 4.3.** Clay and guidance sheet to create the characters in La Moufle / The Mitten [Illustrations from La Moufle, Cécile Hudrisier © Editions Didier Jeunesse, 2009]

- Image association (memory) games with several representations: photos, drawings, tracings, and their name in writing.



**Figure 4.4.** Memory game cards [Illustrations from La Moufle, Cécile Hudrisier © Editions Didier Jeunesse, 2009]

- Marottes (wooden figures) with a felt mitten into which the figures can be put for a re-enactment of the story:



**Figure 4.5.** *Felt mitten and wooden figures*

These objects were made at *FabLangevin*. These marottes were vectorized and then cut out using a laser cutter.

- Felt figurines or fingerplay to manipulate knowledge individually or in pairs:



**Figure 4.6.** *Felt figurine, fingerplay*

- Masks for dramatization:



**Figure 4.7.** Masks

These masks were offered by the teacher of one of the two classes at the end of the course.

Throughout the sequence, the objects are an anchor for speaking: they serve as a reminder, a trigger or a pivot for oral production in both languages. As regards memorizing the lexicon in English, the work takes place through associating the pronunciation with the visual representation. This visual representation, however, gradually moves away from the illustrations in the picture book.

Following the work done on *The Mitten*, the probationers read the beginning of the tale *The Promise* by Jeanne Willis and Tony Ross (2010). The pupils had to invent the end of the story. In this context, they wanted wooden figures, like those they had been able to handle for the work on *The Mitten*. So they wrote a letter to a group of pupils at Lycée Paul-Langevin in Beauvais to send them their request. Later in the year, the pupils went to *FabLangevin* where they were able to see the laser cutter in operation.



**Figure 4.8.** *The laser cutter*

This school trip was the opportunity to participate in a workshop on coding (with beebots) to understand the communication between the computer and the laser cutter.

More than a month after the work in class, the pupils came to the ESPE to see the exhibition of the objects used during the whole project.

Following this experience with the pupils, the probationers produced reflective feedback.

This multiskilling project has served as the framework for our study. The data harvested are as follows:

- records of the didactic analysis work carried out by each group of student school teachers currently at the ESPE (written report);
- class observations during the sessions given by the student teachers;
- written reflective feedback from each probationer following the didactic experiment;
- an interview with the contracted teachers of the host classes.

The sessions were also filmed. However, greatly to our regret, these videos remain confidential at the school and could not be included in the list of analyzed data. This unfortunately deprives our study of a detailed analysis of the quality of the pupils' oral productions.

From all the data collected, we studied the role of objects for the language development of pupils in the two kindergarten/pre-kindergarten classes and also the development of professional skills in probationers and their relationship to object-

instruments for the language teaching-learning. Our study therefore has two interconnected aspects: the teacher and the pupils.

### **4.3. Learning Objects: Speech Instruments for teacher and pupils**

Over the course of the sequence, the objects thought up and designed by the probationers and the pupils became instruments to generate speaking among the students.

#### **4.3.1. Support that determines awareness among probationary school teachers**

Like the probationers who used works of art for learning Spanish (Pelissier-Chaze 2019), the probationers involved in the multi-skilling project, in the context of our study, were led to identify details of the picture book *La Moufle / The Mitten* to work on language with kindergarten pupils. First of all, it should be noted that using a modern foreign language, in this case English, has proved to be a problem for some. Even though a school teacher is expected to have a level of B2 in a foreign language as per the Common European Framework for Languages (CEFR), reading a literary work in a foreign language is something student teachers sometimes dread. Moreover, even though they are often familiar with children's literature, probationers may encounter difficulties when it comes to performing and making use of a didactic analysis.

Firstly, reading a story involves taking ownership of it and reading it critically to identify its specificity, focusing on both an ambitious text and rich illustrations. *La Moufle* (by Desnouveaux and Hudrisier) / *The Mitten* (by Roome) is a picture book with a cumulative story, introducing complex lexical fields relating to winter and movement (with verbs such as "wiggles in", "hides inside", "squeezes round", "shake themselves off", "dash quick as a flash" etc.). There is also a set of assonances and rhymes that facilitates memorization (e.g.: "quelle aubaine, une maison de laine / It's my lucky day, a woolen house, it's free, it's for me!"). The illustrations also lend themselves to exploitation, alternating between representations of the outside and the inside of the mitten. However, using images with the pupils entails, on the one hand, having carried out a considered analysis to determine, for example, what may prove to be an obstacle to understanding and, on the other hand, the pupils understanding that an illustration is not real. It is up to the teacher to guide the pupils towards this realization by helping them to verbalize and to make the connection between the real and the imaginary. In this case, with the picture book *The Mitten*, the teacher can discuss the fact that a wild boar does not wear britches in the wild. The pictorial representations are complementary to the mental representation: it is due to the juxtaposition of these different pictorial representations that the differences and similarities can be recognized. The teacher

must also be careful to vary the representations to facilitate understanding of the generic term. In exploiting this picture book, these elements must be taken into consideration.

The picture book chosen for this project is very well known and has been the subject of numerous contributions posted on the Internet. It is thus easy to understand the difficulties that can emerge: the probationer can easily succumb to the temptation to collect objects on websites they visit to make them into their teaching instruments. But there is a strong risk that activities planned thus will be guided by the nature of these objects and not by the definition of precise objectives. This is particularly the case with the guidance sheets made available to the pupils to suggest the steps to be followed to make one of the animals in the story. The work process of the probationers with regard to these sheets is interesting to analyze in the development of their professional skills. In fact, this type of material is found on many internet websites and this profusion of objects could help student teachers to foster their creativity or, conversely, to be an obstacle to reflection. In this case, two of the guidance aids for the modeling workshop proposed by the trainees were aids collected on-line and proposed with no modification. These aids featured a regular distribution of steps in lines, not in columns, with a hand to indicate the order in which the images were to be used. However, the model presented for the three-dimensional production was a flat two-dimensional model. Two other guidance sheets were original creations by the student teachers and had a greater impact in reflective terms. They showed photographs of the different stages, spread out in two successive rows from left to right on both sides of a single page. These were accompanied by long, complex written instructions. The pupils' creations, depending on the type of guidance sheet, helped the student teachers become aware of the shortcomings of these sheets but also of their usefulness. However, it is clear that the student teachers have difficulty taking the pupils' perceptions into account and putting themselves in their place. The student teachers thus need to become aware of the need to check the proposed pedagogical approach by carrying out the planned task or the expected creation, themselves.



**Figure 4.9.** *Pupils' creations*

Despite all the group preparation done in advance, it was only during the sessions with the pupils that the probationers discovered certain problems. They had, for example, not anticipated the difficulty related to the choice of and its handling: for clay to be malleable, it is actually necessary to add water to it. Incidentally it should also be noted that there are no colors on these objects and therefore the shape is of prime importance to the representation and identification of the animal. On this point, the pupils themselves took the initiative in creating figures of different sizes to take into account this characteristic which may have seemed relevant to them, but which had not been mentioned by the probationers on their guidance sheet. There is a very interesting implication here on the part of the pupils, an implication which testifies to an instrumental genesis at the level of the pupils themselves. Despite the unforeseen problems, the pupils still made a success of the workshop, which was particularly important, given the fact that the model thus created served as a learning object in the next activity.

The new teacher needs support when making use of a picture book for the first time, to make him/her aware of the complexity of the task. In order for the student teachers to understand this, it was necessary for them to be able to observe and analyze the result of the pedagogical process that they had planned. This is particularly difficult for young teachers to do when they are on their own in the classroom. The student teachers were able to perform this reflective feedback on the pupils' creations due to the data that were collected. It was because there was a sufficient number of student teachers at the time of the didactic experiments in the class that they were able to note down the pupils' successes and problems during the sessions and analyze them later at the ESPE. The reflections and discussions between peers on the pertinence of the teaching aids and the selected learning

objects also contributed to making them aware of this. Finally, all the time allocated to the planning and then the analysis of work done in class with the pupils also plays a role in the potential dawning of this awareness. The student teachers had to spend a long time on the didactic analysis of the objects and on the guided reflexive feedback of a class process for which they had had to consider the fit between the objectives, the proposed activities and also the tools used, the nature and the realization of the pupils' creations as well as the transferability of the skills developed during the multi-skill project.

Growing awareness and practice will subsequently become routine in the didactic analysis of new picture books.

#### ***4.3.2. On the effect of object-instruments on pupils' speech***

The probationers proposed objects which they thought would encourage the pupils to speak in both French and English. The actual pupil activity turned out to be more or less in line with what the probationers had predicted.

Different situations initiated by the objects, the teacher's instruments, generated speaking situations, sometimes within the framework predicted by the probationers as was the case with the use of sequential images to recreate the chronology of the story, on the basis of which the pupils were able to relate the gist of the story in French. But speaking sometimes went beyond what was envisaged by the probationers. Starting with the nursery rhymes and reading the picture book, for example, there was a lot of discussion amongst the pupils who, interpreting the teacher's guidance liberally, seized this opportunity to develop their thinking, while still staying on topic. Thus all the probationer had to do was to act as moderator in the discussion. In addition, making use of masks in a dramatization of the story was an opportunity to reuse the knowledge and mobilize the skills developed. This will give rise to a strong pupil engagement, especially among those who do not have French as their native language. The students were not afraid to speak and lend their voice to the puppet, which the contracted teachers see as a progression for the pupils. Speaking was also prompted by mutual assistance situations between pupils, either in pairs or in small groups. The probationers had set up heterogeneous groups with children who were comfortable with oral work teaming up with other pupils who found it more difficult, or newcomers. In the part-supervised object-handling workshops with four pupils or in pairs, some would pronounce the word that a classmate was looking for. Cooperation and thus mutual assistance in terms of language can also be observed when instigating games such as image association: the pupils communicate and discuss to reposition the stages of the story in chronological order, for example. The probationer simply prompts them to speak and encourages them to produce the name of the animal whose representation the



pupil is holding in his/her hand. The most pertinent workshop in terms of mutual assistance was certainly the one with the felt mitten and the wooden figures to be brought in. The act of putting the character into the mitten captured the pupils' attention and generated much use of language. To be able to introduce the character, it was necessary to pronounce the word properly. After that, all the pupils repeated the word in question. To guarantee the success of the task, some assist each other (e.g. when the teacher asks: "Who's got Fox?" another pupil replies, "Cloé", and Cloé moves her figurine towards the mitten), while others even go so far as to swap their characters to make sure of succeeding.

Still in the workshop with the mitten and wooden figures, we can note an interesting moment in the discussion prompted by the characteristics of the objects themselves. In fact, in the story, the chubby bear tries to go into the mitten and it bursts (the word used in the story in French is "craque"). During the workshop, the pupils found themselves confronted with a problem: they are worried about the mitten (made of felt in the workshop whereas it is woolen in the story); however, the size of the bear is such that he can actually fit into the mitten. All the pupils, however, agreed to stop the action and look at the mitten. A pupil then commented that "it has no Velcro® opening to open it" and another said "oh, no, it doesn't have a Velcro® opening?, it mustn't burst". As soon as the first concerns were expressed, the pupil responsible for putting the bear in the mitten took his/her figurine out and waited for the end of the discussion. This situation and the related discussion undoubtedly raise the question of the alignment between the objects proposed to the pupils and their expectations. How far would they have liked to go in recreating the story? That would involve work on the size of the objects.

Finally, out of all the workshops offered, it is particularly interesting to note that the learning objects that generated the most speaking among the students are those involving the least handling. In fact, the flashcards, as opposed to the clay and the guidance sheets, resulted in the pupils offering enhanced oral productions.

Throughout the sequence, the pupils repeatedly displayed the need to use specific terms relating to the learning objects. This was particularly the case during the visit to the *FabLangevin* where the pupils saw the laser cutter and had fun naming the characters in French and English, even before the cutting was finished. When the person demonstrating the laser cutter thought he recognized a rabbit, the pupils were eager to correct him/her by saying that it was a hare. Likewise, they explained that the bear is chubby and thus displayed their knowledge. The interest in specifying the vocabulary precision was noted at the exhibition at the ESPE where, remarkably, the pupils were able to reproduce the lexicon spontaneously and independently. For example, the pupils were able to use the term "laser cutter" and recall its characteristics such as the small flame. Their words were clear and precise

and testified to an anchoring linked to the experience. They could talk about objects in their absence, which is interesting.

The mere fact that the pupils themselves asked for wooden objects in order to approach the new picture book (*La Promesse*) raises the issue of their interest in these learning objects. In fact they eagerly looked forward to having these objects and always sustained their interest to the point of getting involved in their design since they participated in the last stage of manufacture, namely the gluing of the illustration of the characters onto the wood. The pupils also suggested putting a stick on the large figurines to make them easier to handle. To go further, it would be relevant to know whether this interest comes from the physical characteristics of the objects or whether there is affect towards these learning objects, or even an awareness of the role of these learning objects as instruments in the work. In this case, the students' request would correspond to the wish to equip themselves.

The pupils' oral work (both in French and in English) with these learning objects thus went beyond what was envisaged by the probationers, reaching a reflection on the objects themselves which by then had become instruments.

To conclude, it appears that the learning objects selected by teachers did indeed become instruments for language development, both for the probationers and for the pupils. On the other hand, the instruments as proposed by the teacher became, in some cases, the object of a redefinition of the task (in the sense of Leplat 2000) and became instruments specific to the pupils after their instrumental genesis.

#### **4.4. Conclusion and Perspectives**

Our study highlights the gap that may exist between the usage of objects envisaged by the probationer and the actual use.

Instruments initially envisaged by the probationers as aids can in reality prove to be complex and not permit the work initially planned, in particular because of representations of the teaching-learning situation which lead to the performance of an inappropriate task. The probationers thus become aware of the importance of defining sub-objectives for each stage/object. Moreover, in terms of our data, it also appears that, in situations of group activities instrumented (Folcher and Rabardel 2004) by images and other objects, the pupils themselves envisage new patterns of use. Thus, the same learning object can be a different instrument for the teacher and for the pupils. The teacher must therefore be able to manage this tension and adapt, always in favor of the pupils' learning.

In addition, this research highlights the importance of didactic experiments within a project as part of the training, with support ranging from the creation of objects to the reflective process, including object-handling benefiting from the

experience of the host school teacher, for example. The probationers can then develop awareness of the potential of certain teaching aids and better identify areas where vigilance is needed. This awareness is reinforced by the work context where probationers have discussions with their peers, which can be a source of motivation. Several probationers also picked up certain aspects of their project work and put them into practice in their own class.

Subsequently, it would be interesting to conduct a similar study on a larger group of probationary teachers in a context other than demonstration schools. In fact, the pupils at these schools are particularly well-accustomed to visits from young teachers who present them with different tasks to which they adapt.

We would like to extend our sincere thanks to the ESPE trainers who initiated this multi-skill project, to the probationary teachers, to the teachers at the demonstration schools and their pupils, and also to the members of *FabLangevin* at Lycée Paul Langevin in Beauvais (<https://paul-langevin-beauvais.ac-amiens.fr/>)

#### 4.5. Bibliographical references

- Bourda Y. (2001). Objets pédagogiques, vous avez dit objets pédagogiques ? *Cahier de Gutenberg* 39-40, 71–79.
- Cerratto Pargman, T. (2005). Pour une conception des technologies centrée sur l’activité du sujet : le cas de l’écriture de groupe avec collecticiel. In *Modèles du sujet pour la conception : dialectiques activités développement*, Rabardel, P., Pastré, P. (eds.), Octarès, Toulouse, 157–188.
- Conole, G., Dyke, M. (2004). What are the affordances of information and communication technologies? *ALT-J, Research Learning Technology*, 12(2), 113–124.
- David, J.-P. (2003). Modélisation et production d’objets pédagogiques. *Sciences et Techniques Educatives, Hors-Série “Ressources numériques, XML et éducation”*, Hermès, 1–38.
- Desnouveaux, F., Hudrisier, C. (2009). *La Moufle*. Didier Jeunesse, Paris. [picture book translated into English by Phyllis Roome in 2014].
- Folcher, V., Rabardel, P. (2004). Hommes, artifacts, activités : perspective instrumentale. In *Ergonomie*, Falzon, P. (ed.). Presses Universitaires de France, Paris, 251–268.
- Kennewell, S. (2001). Using affordances and constraints to evaluate the use of information and communications technology in teaching and learning. *Journal of Information Technology for Teacher Education*, 10(1-2), 101–116.

- Kirschner, P. (2002). Can we support CSCL? Educational social and technological affordances for learning. In *Three worlds of CSCL: Can we support CSCL?* Open University of the Netherlands, Heerlen, 7-47.
- Leplat, J. (1997). *Regards sur l'activité en situation de travail. Contribution à la psychologie ergonomique*. Presses Universitaires de France, Paris.
- MEN (2015). Programmes d'enseignement de l'école maternelle (Special Official Bulletin No. 2 of March 26, 2015). French National Ministry of Education. Available at the following address:  
[https://cache.media.education.gouv.fr/file/MEN\\_SPE\\_2/84/6/2015\\_BO\\_SPE\\_2\\_404846.pdf](https://cache.media.education.gouv.fr/file/MEN_SPE_2/84/6/2015_BO_SPE_2_404846.pdf)
- Maternelle de Bambou (2015). Available at <http://maternelle-bambou.fr/la-moufle-des-nouveaux-hudrisier/> [Viewed March 5, 2020].
- Leplat, J. (2000). *L'analyse psychologique de l'activité en ergonomie : Aperçu de son évolution, ses modèles et ses méthodes*. Octarès, Toulouse.
- Pelissier-Chaze, S. (2019). Rôle et fonctions d'objets symboliques en langue-culture étrangère : les tableaux de maîtres espagnols du Musée de Picardie. *Recherches en didactiques*, 27(1), 77-88.
- Pernin, J.-P. (2003). Objets pédagogiques: unités d'apprentissage, activités ou ressources. *Revue Sciences et Techniques Educatives, Hors série*, 179-210.
- Rabardel, P. (1995). *Les hommes et les technologies : approche cognitive des instruments contemporains*. Armand Colin, Paris.
- Roome, P. (2014). *The Mitten*. Didier Jeunesse, Paris.
- Scanlon, E. (2010). Technology enhanced learning in science: interactions, affordances and design based research. *Journal of Interactive Media in Education*, 8, 1–18.
- Willis, J., Ross, T. (2010). *La Promesse*. Gallimard Jeunesse, Paris.
- Zaid, A., Bisault, J., Le Bourgeois, R. (2019). Objets pour apprendre, objets à apprendre, Présentation du numéro. *Recherches en didactiques*, 27(1), 5-10.