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Explicit Instruction: Evaluating the Fidelity of a Teacher's Practice Supported by Professional Development and Directive Coaching A Case Study

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Abstract: Training teachers in evidence-based practice is a societal challenge. We conducted practical action research to investigate the impact of a professional development programme (the aim of which is to train teachers in explicit instruction) established according to the principles of effective professional development on one teacher's practices. A holistic case study was conducted with one teacher randomly selected among a group of volunteers. An original methodology was developed to measure the fidelity of the teacher's practices to the different teaching practices and stages of explicit instruction. The teacher's practices were filmed on four occasions and analysed using an observation grid based on the literature on explicit instruction. The advice and intentions to act expressed during coaching sessions were listed. By comparing them with the teacher's practices, it was possible to identify whether or not they had been implemented. The results indicate that after the first coaching session, the teacher was able to implement the stages of explicit instruction. During the following observations, her implementation of explicit instruction was even more precise. However, she did not implement specific checking for understanding. These results support the interest of directive coaching to support the implementation of explicit instruction.

Keywords: explicit instruction, fidelity, coaching, professional development, observation

Introduction: On the Development of Effective Practice and Professional Development (PD) for Teachers

Improving the effectiveness and equity of the education systems is a major challenge for societies. With reference to Bloom (1979), effective education is characterised by three joint effects: an increase in the average of all student outcomes, a reduction in the variance of all outcomes, and a decrease in the correlation between students' initial characteristics (e.g., social background) and their outcomes. Effective teaching is therefore also equitable. Research on effective teachers has shown that the practices used by teachers have a very strong impact on student learning (Butler, 2020; Bressoux, 1994, 2001, 2008, 2012; Gauthier et al., 2013; Hattie, 2009, 2012; Muijs et al., 2014; Wiliam, 2018). Moreover, based on a

wealth of empirical research conducted in classrooms, it has been shown that some teaching practices are more effective than others (e.g., Bressoux, 1994; Gauthier et al., 2013; Guilmois, 2019, Guilmois & Popa Roch, 2021; Hattie, 2009; Royer, 2019; Slavin, 2013; Zhang et al., 2021). These (more) effective practices include explicit instruction (Bissonnette et al., 2010; Rosenshine & Stevens, 1986), Direct Instruction (e.g., Bereiter & Engelman, 1966; Hammond, 2022), mastery pedagogy (Bloom, 1971; 1979; 1984) and the “Success for all” programme (Slavin, 2008; Slavin et al., 2009). These different pedagogical approaches are referred to as instructional: despite some differences, they share the fact that “the teacher teaches academic content in a systematic, structured and explicit way” (Gauthier et al., 2013, p.33).

Given the importance of enabling all students to achieve expected outcomes, some education systems, such as in Australia, Quebec, French-speaking Belgium and France, have shown a recent¹ and growing interest in effective teaching practices (Bocquillon, 2020; Bissonnette, 2008; Bressoux, 2022; Hammond & Moore, 2018). Given that implementing effective practices is not self-evident (e.g., André et al., 2019; Nelson-Walker et al., 2013; Schillings & André, 2019), their implementation by teachers requires attention to be given to professional development (PD), which is initiated during initial training (Brodeur et al., 2005) and continues during in-service training. Indeed, it can be defined as: “a process that brings together a set of activities [...] enabling teachers to improve their teaching practices with a view to improving student learning” (Richard, 2020, p. 53).

However, PD programmes struggle to change and improve teacher practice and improve student outcomes (Guskey, 2021). Therefore, there is a need to provide PD programmes based on the proven principles of effective PD and to evaluate their effectiveness. Indeed, the notion of effectiveness also applies to PD, i.e., certain PD activities lead to effective and sustainable changes in teachers' practices and improvements in students' educational outcomes (Guskey, 2021).

As Richard et al. (2017) have pointed out “coaching and direct classroom observation are effective interventions to be preferred” (p. 18). Indeed, given the discrepancy between teachers' reported practices and those actually implemented by them (e.g., Bressoux, 2001; Clanet & Talbot, 2012; Good & Brophy, 2008), direct observation and coaching are methods to be favoured to enable teachers to become aware of their teaching practices, to modify them and to check whether they are implementing what they have learned from training (e.g. Aeby & De Pietro, 2003; Pianta & Hamre, 2009). Although the effectiveness of training based on coaching for effective practice (e.g., De Jager et al., 2002; Gunn et al., 2021; Hammond & Moore, 2018; Kohler et al., 1997) has been documented, this type of training is still only very rarely implemented in several education systems, such as in French-speaking Belgium.

Among the various effective pedagogical approaches that teachers can be trained to use, this article focuses on explicit instruction. Explicit instruction is “combination of teaching behaviours designed to promote student learning” (Gunn et al., 2021, p. 268). It is so named “because it is an unambiguous and direct approach [...] characterized by a series of supports or scaffolds, whereby students are guided through the learning process” (Archer & Hughes, 2011, p. 1). Several authors (e.g., Archer & Hughes, 2011; Baco, 2019; Bocquillon, 2020; Gauthier et al., 2013) present this teaching approach in the following way: explicit instruction consists of stages to be implemented in a certain order - the opening of the lesson, modelling, guided practice, independent practice and the closing of the lesson. During each of these stages (detailed later in the text), a set of teaching practices, which teachers can be trained in, is implemented. The respect of the above-mentioned stages is particularly

[1] The interest in these practices can be described as recent in different educational systems, such as in France or French-speaking Belgium, where constructivist pedagogies are widespread (AEQES, 2014; Gravé et al., 2020a, 2020b), as is also the case in Australia (Hammond & Moore, 2018).

important for a lesson to be qualified as an explicit instruction lesson. For example, if modelling is carried out by the teacher after a research/discovery phase by the pupils, and not at the beginning of the lesson, then the lesson cannot be qualified as explicit instruction. Rather, it can be qualified as a lesson belonging to a constructivist teaching approach (Gravé et al., 2020a; 2020b).

This paper presents the evaluation of the fidelity of the implementation of explicit instruction by a primary teacher during a research that respects the key concepts of practical action research as defined by Mills and Gay (2019). With the guidance of the university team, the teacher took part in the planning of a training and coaching programme that she followed in order to professionally develop, systematically reflect on her practices and improve the situation in her school. The PD and coaching programme were established according to the principles of effective PD (Desimone, 2009; Desimone & Pak, 2016; Richard et al., 2017) and other PD and coaching programmes aimed at training teachers in effective practices (Bocquillon, 2020; De Jager et al., 2002; Hammond & Moore, 2018; Kohler et al., 1997; Morgan et al., 1994). The fidelity (Kretlow & Bartholomew, 2010; Hammond & Moore, 2018) with which teachers implement the effective practices they were trained in is important, as it is a “critical variable for maximizing student achievement” (Kretlow & Bartholomew, 2010, p. 279). To this end, a new methodology based on low-inference direct observations has been developed to model explicit instruction. This methodology contributes to the evaluation of PD programmes (Guskey, 1999; 2000; 2002). Based on observations, the implementation of the coach's advice by the teacher was also evaluated.

Research Questions

This article answers the following research questions:

- 1) What were the stages of explicit instruction implemented by the teacher?
- 2) To what extent has the teacher implemented the stages of explicit instruction with fidelity?
- 3) Was the advice provided by the coach implemented by the teacher from one filmed lesson to the next?

What are the Principles of Effective Professional Development Programmes?

Based on 50 studies that met strict inclusion criteria (e.g., the selected studies had to report the results of the training PD program evaluation in order to be classified within one of the levels of Guskey's (2002) model presented below), Richard et al. (2017) identified five "general principles [of effective PD] that are evidence-based and applicable across subject areas" (Richard et al., 2017, p. 1). These five principles are (a) "professional development should be explicitly aimed at improving student outcomes" ; (b) "PD activities should be evidence-based and facilitated by specialists with recognised expertise"; (c) "PD should include a coaching approach based on collaborative work"; (d) "PD should be distributed over time"; (e) "teacher PD must be supported by a principal demonstrating instructional leadership" (Richard et al., 2017, p. 12). These are in line with the characteristics of effective PD highlighted by Desimone and Pak (2016) and Guskey (2021). Richard and his colleagues (2017) highlighted the importance of direct classroom observation and coaching as an effective PD activity (Guskey, 2021; Kraft & Blazar, 2018; Richard et al., 2017), which is the focus of this article.

How to Evaluate Professional Development Programmes?

On the basis of a review of the literature on the relationship between teacher PD and student learning, Guskey (1999; 2000; 2002) identified five levels for evaluating the effectiveness of PD programmes. This model is one of the most frequently used (Duchaine et al., 2021) and is also used to evaluate other PD programmes aimed at training teachers in explicit instruction (Baillargeon & Richard, 2021). The five levels of Guskey's (2000) model are hierarchical: success in the previous level is often a prerequisite for success in the next level (Richard et al., 2017).

The first level consists of collecting the participants' appreciation of the training (Guskey, 2000; Duchaine et al., 2021). This type of evaluation is the simplest to implement and analyse (Guskey, 2002; Richard et al., 2017), and is also the most common (Bocquillon, 2020). The second level consists of assessing participants' learning (Guskey, 2000), i.e., “the knowledge, skills and attitudes acquired by participants during the training session [...]” (Richard et al., 2017, pp. 38-39). The third level “evaluates the organisational support provided to teachers to implement the changes recommended by the training (in particular the involvement of the principal)” (Bocquillon, 2020, p. 137). This one is more difficult to implement, but it is very important, as a lack of support can undermine the effectiveness of the PD programme (Guskey, 2002; Richard et al., 2017). The fourth level assesses teachers' transferability (Fontaine et al., 2013), i.e., the “degree and quality of implementation” (Guskey, 2002, p. 48) by teachers of the PD programme elements. This assessment can take the form of direct observation (Leroux et al., 2015). The fifth level assesses the added value of PD on the final beneficiaries, the students (Guskey, 2002). To do this, various variables can be assessed (e.g., student learning, affective dimensions, etc.) using different tools (standardised assessments, direct observations, etc.) (Richard et al., 2017).

Explicit Instruction: A Question of Stages and Teaching Practices

During an explicit instruction lesson, the teacher implements different stages characterised by specific teaching practices. The teacher begins by opening the lesson. This is done by capturing the attention of the students (e.g., by a sentence and/or a gesture), presenting the learning objective, justifying its relevance and checking that the students have mastered the prior knowledge necessary for the new learning (e.g., Archer & Hughes, 2011; Gauthier et al., 2013; Rosenshine & Stevens, 1986).

Then, the teacher conducts the lesson by implementing three stages (Bocquillon et al., 2021), which are considered to be the “core” of explicit instruction (Rosenshine & Stevens, 1986, p. 380): modelling, guided practice and independent practice. In modelling, students “learn how, and sometimes when, to do something” (Hughes et al., 2018, p. 220). To do this, the teacher implements two behaviours: demonstrating the actions to be performed and describing them (Hughes et al., 2018; Doabler et al., 2015) by putting a speaker on their thinking, i.e., verbalising the steps they go through, the questions they ask themselves, etc. (Gauthier et al., 2013). During modelling, the teacher presents examples and counter-examples (Archer & Hughes, 2011; Gauthier et al., 2013; Hughes et al., 2018) and highlights important aspects to remember (Gauthier et al., 2013).

After modelling, the purpose of guided practice is to allow students to practise tasks similar to those modelled by the teacher, with other students and the teacher. During this stage, the teacher implements several key teaching practices that were not necessarily implemented during modelling. For example, they solicit frequent responses from students (Hammond & Moore, 2018; Nelson-Walker et al., 2013) by implementing a great number of

interventions aimed at checking their understanding (Bocquillon et al., 2021; Doabler et al., 2015; Gauthier et al., 2013), which often take the form of questions (Bocquillon, 2020). In order to select students to respond to the teacher's checking for understanding interventions, the teacher uses an explicit randomization system, i.e., they randomly assign students to respond to their prompts, in order to allow as many students as possible (and not only those who volunteer) to obtain feedback (Bocquillon et al., 2021; Gauthier et al., 2013; Hollingsworth & Ybarra, 2009). The teacher can also solicit choral responses, which increases students' involvement, checks their understanding and provides feedback (Nelson-Walker et al., 2013). During guided practice, the teacher also provides a great deal of immediate feedback (e.g., Turcotte et al., 2015). Depending on the student's success or not, the teacher can opt for different teaching practices (e.g., re-teaching, providing prompts of different types such as cues, reminders, etc.) (Bocquillon, 2020). While modelling is characterised by a great number of verbal interventions aimed at teaching content, with few verbal exchanges between students and teacher, guided practice requires a greater number of verbal exchanges. Although the stages of explicit instruction are distinct, objectively differentiating between them is not easy, as some actions (e.g., checking for understanding) are found within the different stages and the stages are iterative. The iterative nature of the model means that the teacher can return to a previous stage (e.g., from guided practice to modelling) depending on the difficulties experienced by one or more students (Bocquillon, 2020; Bocquillon et al., 2021; Kohler et al., 1997; Rosenshine & Stevens, 1986).

To implement guided practice, different modalities are possible. For example, the teacher may ask a few students to solve tasks on the blackboard (Rosenshine & Stevens, 1986) or orally in front of the class (Clarke et al., 2017), which is a form of “collective guided practice”. The teacher can also use reciprocal teaching (Bissonnette et al., 2010), an activity in which students, in small groups or dyads, complete tasks by taking turns to express their reasoning orally. The student who listens to their classmate's demonstration benefits from another example of modelling and/or has to provide help if their classmate has difficulties. The teacher, who circulates among the students, aims to ensure understanding, gives feedback, prompts, and re-teaches certain groups if necessary. Also, in the same unit of time and space, some pupils may be carrying out guided practice, while others may benefit from further modelling by the teacher. Both modalities, collective guided practice and reciprocal teaching, can be combined in the guided practice stage. Whatever the guided practice modality, enough exercises should be completed by the students so that each of them gets 80% correct in a formative assessment before they can start independent practice. If students are struggling at this stage, the teacher offers them more guided practice or re-modelling (Bocquillon, 2020; Rosenshine & Stevens, 1986).

During independent practice, students individually perform tasks similar to those performed during modelling and guided practice (Bocquillon, 2020; Rosenshine & Stevens, 1986). The teacher continues to check their understanding and to provide feedback and prompts, ensuring that the level of support is gradually decreased according to the student's performance (Bocquillon, 2020; Doabler et al., 2020; Hughes & Riccomini, 2019). The expectation here is that each student will achieve between 90% and 95% correct answers (Rosenshine & Stevens, 1986). If students have difficulties, the teacher can give them additional exercises and/or reteach the content (Gunn et al., 2021), illustrating the iterative nature of the model (Bocquillon et al., 2021). Finally, comes the closure of the lesson, which is characterised by a moment of checking for understanding and synthesis, the announcement of the next lesson by the teacher and the continuation of practice by the students (Archer & Hughes, 2011; Gauthier et al., 2013).

Method

The Choice of Practical Action Research and of a Case Study

Practical action research (Mills & Gay, 2019) was conducted. Indeed, this research was conducted in accordance with the key concepts of practical action research defined by Mills and Gay (2019). The research was conducted as part of a project in which the teachers wanted to professionally develop, systematically reflect on their practices and improve their school's situation. To do this, they chose a subject on which to focus (improving their students' results by implementing explicit instruction). Under the guidance of the university's research team, a sample of volunteer teachers (see below) determined a data collection method (based on video recordings). They took part in analysing the videos and used the results to improve their teaching practices.

For the study presented in this paper, the case study methodology (Derobertmeasure & Dehon, 2012; Derobertmeasure et al., 2015; Mills & Gay, 2019) was chosen in order to accurately investigate the fidelity of practices to explicit instruction. It is a "qualitative research design in which researchers focus on a unit of study" (Mills & Gay, 2019, p. 404) (e.g. a teacher). The case study "combines scientific requirement and clarity in the communication of an experience (Albero, 2010)" (Derobertmeasure et al., 2015, p. 4) and is appropriate especially when the researcher wants to describe a phenomenon precisely (Mills & Gay, 2019), which was the case in this research. Indeed, the interventions of the teacher and the students during the filmed lessons (just over 8 hours of video recordings), as well as the interventions of the coach and the teacher during the coaching sessions (approximately 2 hours and 25 minutes of coaching) were analysed in great detail using a holistic case study (Yin, 2009). The need to make very precise observations of the many interventions by the teacher and the students justifies the choice of a case study. The methodology is described below.

Recruitment and the Case

Participation in a research project on explicit instruction was offered to the entire teaching team (N=30) of a French-speaking Belgian school that had contacted our team for training in explicit instruction. Seven teachers volunteered. Three teachers were not selected because they did not meet the inclusion criteria of the research, i.e., being a primary school teacher, not having already received training in explicit instruction / not having a very good knowledge of this pedagogical approach. The remaining four teachers were selected to participate in the research. For the study presented in this article, one teacher out of the four was randomly selected (Berthier, 2016) for a case study. To select the teacher at random, a random draw was carried out using Excel software. The volunteer teacher selected using this approach was named Julie (not her real name). She was 36 years old, had been teaching for 14 years, and had been teaching a Grade 1 class for 7 years. She was not familiar with explicit instruction until she was trained in the PD programme presented in the next section.

The Implemented Professional Development and Coaching Programme

Based on the principles of effective PD (Richard et al., 2017; Desimone & Pak, 2016) and other PD and coaching programmes aimed at training teachers in explicit instruction (or closely related approaches) (Bocquillon, 2020; De Jager et al., 2002; Hammond & Moore, 2018; Kohler et al., 1997; Morgan et al., 1994), the PD programme at the heart of this research aimed to train teachers to implement explicit instruction. In summary, the PD

programme implemented consisted of two first days of collective training (for the whole team) (CT), followed by three cycles: Feedback on the selected teacher's lesson preparations (FB) - Implementation of the lessons by the teacher and observation of the lessons by the coach (O) - Coaching sessions on performance (CS). These three cycles were planned by the four volunteer teachers guided by the university research team, which is in line with practical action research (Mills & Gay, 2019). The coaching provided was directive (Hammond & Moore, 2018; Ippolito, 2010), as the coach's advice was aimed at changing the teacher's practices (Ippolito, 2010; Snyder et al., 2015). As part of the practical action research (Mills & Gay, 019), the four volunteer teachers opted for directive coaching because they wanted to receive specific advice from an expert in explicit instruction to help them improve their practice.

Figure 1 shows all the activities of the PD programme (the total duration of the PD and coaching programme was about 40 hours, excluding the time required to prepare the lessons). Thus, in each cycle, the teacher prepared a lesson (together with her colleagues also teaching in Grade 1) according to an outline including the stages of explicit instruction. The topics of the filmed lessons were chosen by the teacher². She was trained in these stages during the second day of collective training. She then implemented the planning in a filmed lesson and participated in an individual coaching session based on the video of her performance.

Prior to these three cycles, an initial observation (O1)³ was conducted in order to obtain a "baseline": the teacher presented a lesson "as she usually does" (without necessarily following the explicit instruction approach). A one-to-one coaching session was organised following this first observed lesson. Before the last of these three cycles, a third day of collective training to reflect on the training was held. It should be noted that due to the COVID-19 pandemic, all activities in the PD programme, with the exception of the first day of training and the filmed classroom lessons, were carried out remotely, via the TEAMS software. The teacher, the parents of the students filmed and the coach all gave their written consent to participate in the research.

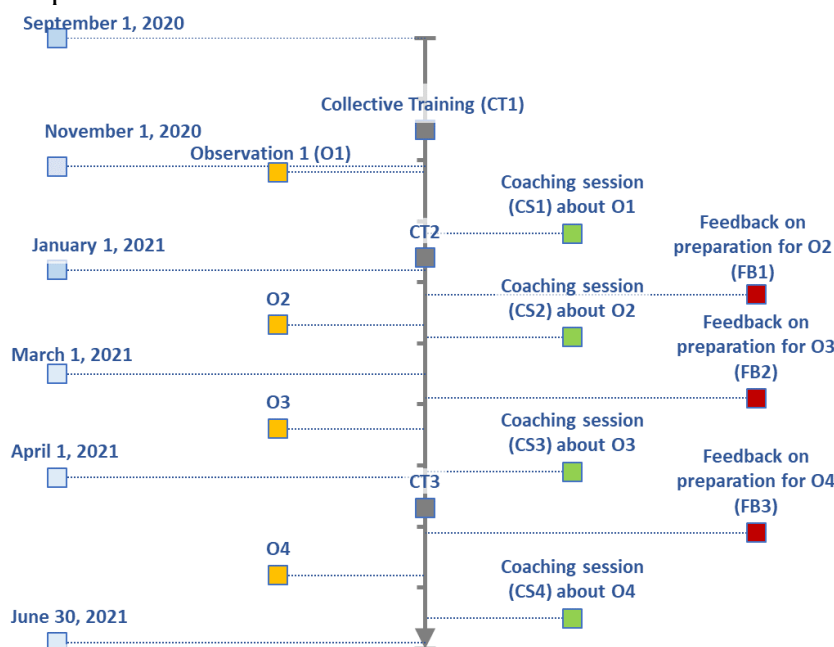


Figure 1. Overview of the implemented professional development and coaching programme

[2] The topics of the three lessons filmed by the teacher in O2, O3 and O4 were: 'subtraction', 'reproduction of figures in a grid' and 'the sentence'.

[3] The lesson topic filmed in O1 was on the sound [N].

Development of a Methodology to Observe Explicit Instruction

Several researchers have observed the implementation of some features of explicit instruction (Baker et al., 2006; Bocquillon, 2020; De Jager et al., 2002; Doabler et al., 2015; 2020; Gunn et al., 2021; Hammond & Moore, 2018; Kohler et al., 1997) or models belonging to the same family of “instructional” approaches (Kretlow et al., 2011; Morgan et al., 1994). Broadly speaking, these observation grids can be classified into two types: “moderate to high inference” grids (Doabler et al., 2020, p. 3) and “low inference” grids (Doabler et al., 2020, p. 4). The former includes categories for which the observer has to position themselves rather subjectively on Likert-type scales. They “rely on observers’ impressions to rate the quality of instructional interactions” (Doabler et al., 2020, p. 3). The latter allow for the counting of certain behaviours and “are often better able to minimize observer inference [...] because they [these instruments] focus on clearly defined target behaviours that are less subjective to interpretation (Snyder et al., 2006)” (Doabler et al., 2020, p. 4).

The grid (Baco et al., 2022), which is available online⁴, is called “Mirror of Steps of Explicit Instruction” (MSEI). It is a low-inference grid in order to reduce the observer's subjectivity. It is based on scientific literature (e.g., Bocquillon, 2020; Gauthier et al., 2013; Hughes et al., 2018; Rosenshine & Stevens, 1986). Figure 2 presents an overview of the grid, which allows the observation of both the teacher's and the students' verbal interventions (content-related student responses). The numbers in the figure correspond to the number of subcategories.

The teacher's verbal interventions are subdivided into 11 mutually exclusive and exhaustive categories allowing the functions of the teacher's verbal interventions to be coded, i.e., each entry in the grid “refers to the objective supposedly pursued by the teacher when they implement a verbal/non-verbal intervention” (Bocquillon, 2020, p. 239). Some categories (“presentation”, “checking for understanding”, “instructions”) are specified by categories which indicate the “sub-function” of the teaching practice (for example, four types of instructions are observed with the grid: instructions for collective exercises, instructions for reciprocal teaching, instructions for individual exercises and instructions for formative evaluation). Some categories (“presentation”, “checking for understanding”, “feedback”, “scaffolding” and “instructions”) are also subdivided into categories that allow the observer to specify which type of content (“prior knowledge”, “content of the current lesson” or “content of a future lesson”) the teaching practice focuses on. Finally, most of the categories are specified by a last level of category and allow the observer to mention the recipient of the teacher's verbal intervention (noted R. on the figure): the whole class, a group of more than two students, a pair or an individual student.

It should be noted that the category “presentation of what/how” has an additional level to specify whether the teacher is presenting an objective, an example/counter-example, an important aspect or “general content”.

Students' verbal interventions are coded through three mutually exclusive categories to specify the types of student responses related to the content. In addition, these categories are further divided into subcategories to identify the “types of students/groups” providing these responses (e.g., students/groups not designated by the teacher).

[4] <http://dx.doi.org/10.13140/RG.2.2.25554.53449>

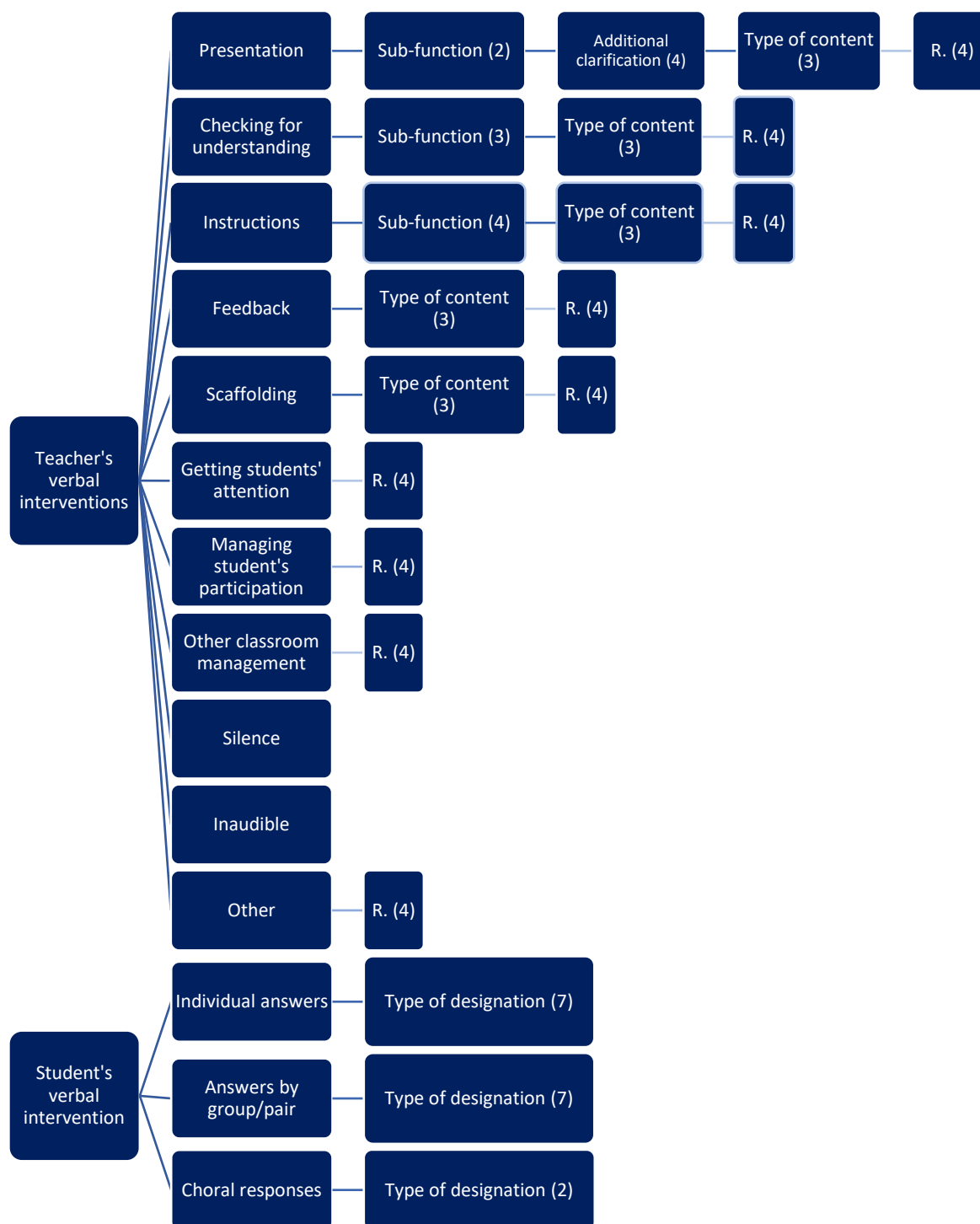


Figure 2. Overview of the observation grid

To ensure the reliability of the grid, an inter-rater reliability score was calculated using the following formula: $\text{number of agreements} / (\text{number of agreements} + \text{number of disagreements}) \times 100$ (Jansen et al., 2003). This score showed 87% agreement (52 agreements out of 60) for the first level of the grid and 80% agreement (48 agreements out of 60) if the second level of the grid (sub-categories) is taken into account. This corresponds to the threshold set by Miles and Huberman (2003) to consider that the inter-rater reliability is satisfactory (80%).

Thanks to this observation grid (Baco et al., 2022) being inserted into a software programme (The Observer® XT), the teacher's teaching practices were recorded in chronological order. Then, from these teaching practices, the stages of explicit instruction implemented were identified objectively on the basis of a list of criteria (available in Appendix A). For example, the "modelling" stage was identified if the teacher implemented a large number of presentation interventions and little feedback. Figure 3 (taken from the third observation) illustrates what the method allowed. From the coded teaching practices, it was possible to identify different stages of instruction.

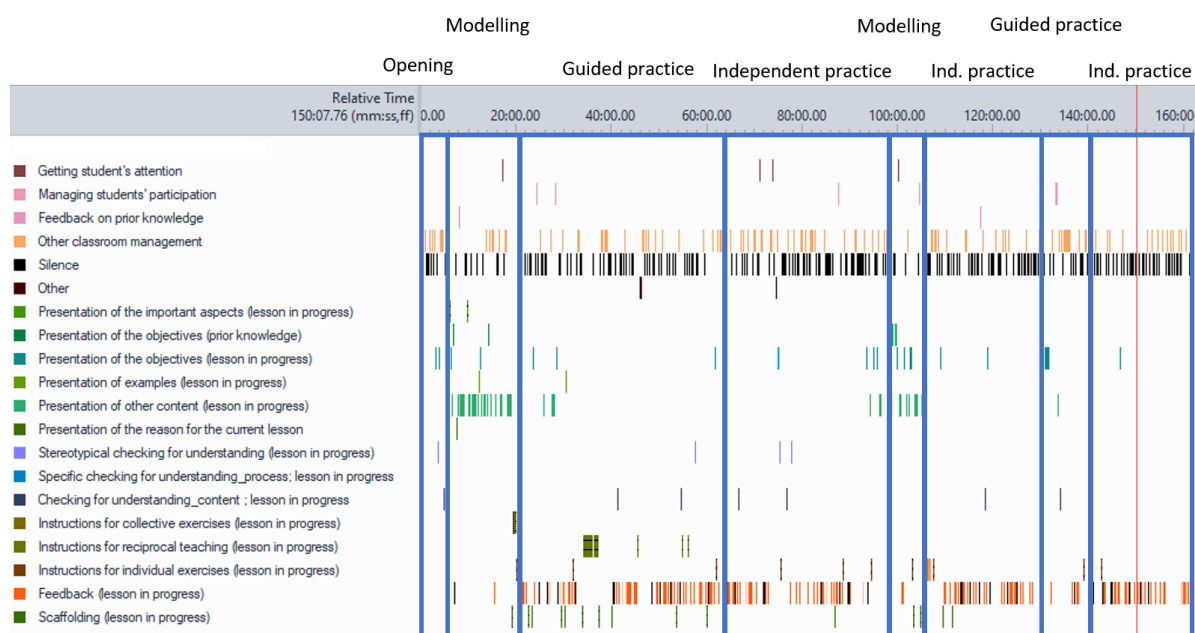


Figure 3. Sequencing of observation 3

A more precise analysis was also conducted. It consisted of evaluating the adequacy between each teaching practice and the stage during which it was observed. To do this, a table of correspondence between each stage and each teaching practice observed (called the “MSEI table” in the following text) was used. Based on the scientific literature, for each stage it lists the characteristic teaching practices (e.g., the presentation of the lesson objective is characteristic of the opening stage) and the teaching practices that are not characteristic of this stage (e.g., the instructions for individual exercises are not characteristic of the guided practice stage). The full grid and the “MSEI table” can be downloaded from <http://dx.doi.org/10.13140/RG.2.2.25554.53449>

Method of Evaluating the Implementation of the Coach's Advice

To assess whether the coach's advice was implemented, the advice given was first recorded by analysing the coaching sessions with an observation grid (similar to the one used to observe the filmed lessons). Then, the implementation of the coach's advice, or the lack of implementation, was identified on the basis of the filmed lessons. For example, if the coach suggested that the teacher implements more feedback in the next observation, the number of incidences of feedback was compared from one observation to the next to identify whether or not the advice was implemented.

Results

Implementation of Explicit Instruction

As shown in Table 1, the grid used made it possible to code the teacher's verbal interventions very precisely (on average, between 17 and 21 interventions per minute). Taking all the observations together, this represents a total of 9,871 coded verbal interventions for the 8 hours 7 minutes and 56 seconds recorded. The number of teaching practices per minute was stable from one observation to the another. The short duration of the verbal interventions (on average 3 to 4 seconds) underlines the complexity of the teaching profession and the multiplicity of tasks that a teacher has to carry out almost simultaneously. As far as the students are concerned, 690 student responses related to content were recorded, all observations taken together. The average number of responses varied from one lesson to the other (between 0.5 and 2.5 per minute). This can be explained by the different lesson topics (in the third observation on figure tracing, fewer verbal responses were solicited, as the teacher observed the non-verbal responses (tracings) of the students).

	O1	O2	O3	O4
Duration of observations	1 h 13 min 12 s	2 h 6 min 34 s	2 h 43 min 55 s	2 h 3 min 11 s
Total number of verbal interventions by the teacher	1209	2588	3505	2569
Average number of verbal interventions by the teacher (in raw number of occurrences) / minute (rounded off to the unit)	17	20	21	21
Average time of a teacher's verbal intervention (rounded to the second)	4 s	3 s	3 s	3 s
Total number of content-related student responses	178	196	75	241
Average number of content-related student responses (in raw number of occurrences) / minute (rounded to the unit)	2,5	1,5	0,5	2

Table 1. Descriptive statistics for the four observations

Regarding the first research question: "1) What were the stages of explicit instruction implemented by the teacher?", as shown in Figure 4, during the first observation (O1), which was a regular lesson of the teacher, carried out before she was coached, the teacher did not implement the "opening of the lesson" stage, nor the "modelling" stage. On the other hand, from the second observation and during the following observations, the stages "opening the lesson", "modelling", "guided practice" and "independent practice" were observed at least once during each observation. During the third and fourth observations, the teacher implemented several phases of modelling, several phases of guided practice and several phases of independent practice, thus illustrating the iterative nature of explicit instruction. Moreover, during the fourth observation, at the end of the lesson, a stage that cannot be qualified as "closing the lesson" in the sense of explicit instruction was observed. Thus, the teacher implemented more and more stages of explicit instruction from the second observation (after

the first coaching session). The iterative nature of the approach was present from the third observation onwards.

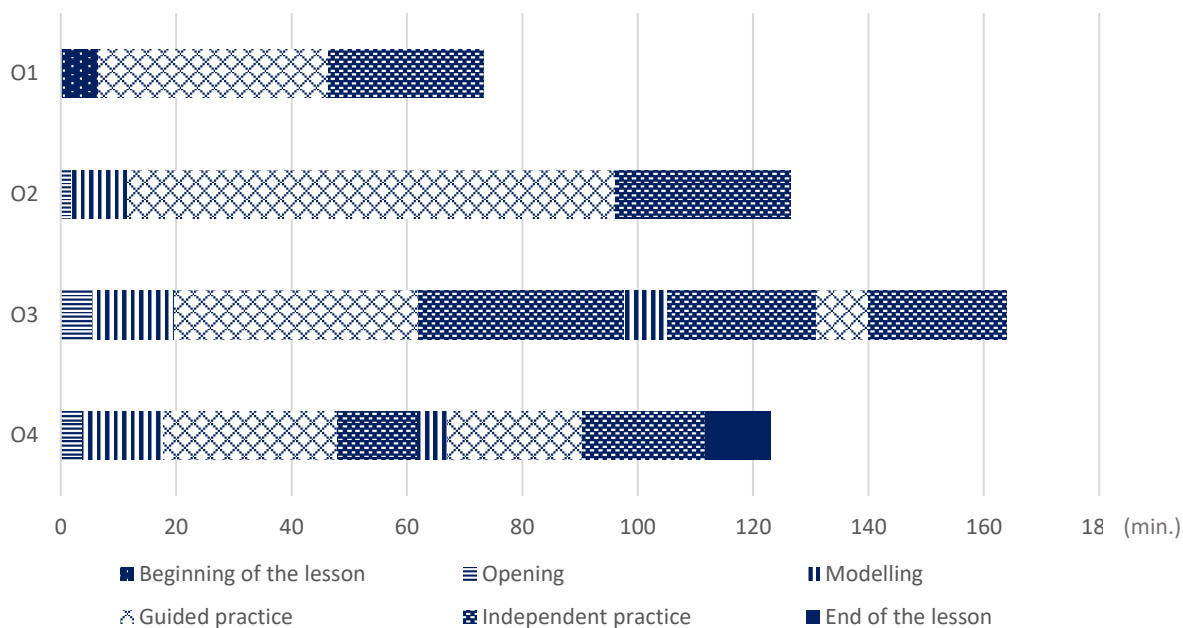


Figure 4. Stages identified within the 4 observations

In order to answer the second research question: 2) “To what extent has the teacher implemented the stages of explicit instruction with fidelity?”, as presented in Table 2, for each stage and for each observation, a comparison between what was observed (interventions of the teacher and of the students) and what was expected according to the "MSEI table" was made. Thus, for each stage, it was possible to identify the ratio between the number of categories implemented as expected by the "MSEI table" (numerator of the fractions in Table 2) and the total number of expected categories (denominator of the fractions in Table 2).

The categories adequately implemented according to the "MSEI table" were of two types: categories implemented by the teacher or students when their presence is expected by the "MSEI table"; categories not implemented by the teacher or students when their absence is expected by the "MSEI table". These two types of categories represented the “adequately implemented” categories (denominator of fractions in Table 2).

If, on the other hand, the teacher or students implemented a category of behaviour that was not expected in the stage, it was not counted. Also, if the teacher or students did not implement an expected behaviour, it was not counted.

For example, during the guided practice of the first observation, of the 37 categories of expected behaviours, 28 categories of behaviours were counted and 9 were not. Of the 28 categories counted, 9 categories corresponded to behaviours expected according to the "MSEI table" that were actually implemented by the teacher or students and 19 categories corresponded to behaviours not implemented by the teacher or students as expected according to the "MSEI table". The 9 categories that were not counted were behaviours that were implemented when they were not expected (N=5 categories) and behaviours that were not implemented when they were expected (N=4 categories).

	O1	O2	O3	O4
Opening	/	33/42 (79%)	32/42 (76%)	33/42 (79%)
Modelling	/	32/35 (91%)	31/35 (89%)	29/35 (83%)
Guided practice	28/37 (76%)	29/37 (78%)	32/37 (86%)	31/37 (84%)
Independent practice	31/34 (91%)	29/34 (85%)	31/34 (91%)	30/34 (88%)

Table 2. Number of categories of teaching practices adequately implemented / number of expected categories

The results indicate that when the teacher implemented a stage of explicit instruction for the first time, between 76% and 91% of the expected categories of actions were implemented. In general, the teacher maintained the number of teaching practices adequately implemented from one lesson to the next. A change was observed for the guided practice stage, during which the teacher implemented 28 of the 37 expected teaching practices during the first observation (76%), compared to 31 during the fourth observation (84%). The "opening of the lesson" stage was the stage that was slightly less well implemented, compared to the other stages. This can be explained by the greater number of different teaching practices expected in this stage (42 compared to 34 to 37 for the other stages). This general analysis of the implementation of the stages can be clarified by focusing on the teacher's verbal interventions during the different stages. The following section presents a focus on the "guided practice" stages, which is an important stage that distinguishes explicit instruction from other pedagogical approaches, such as lecturing (Bocquillon, 2020).

Focus on Guided Practice Stages

As shown in Table 3, during the guided practices, the teacher systematically implemented "checking for understanding (content)"⁵, numerous instances of giving feedback (between 18% and 24% of the interventions of the stage), scaffolding and she managed students' participation. For example, to implement checking for understanding (content), the teacher said sentences that a student had to finish such as: "Now we have to..." (22 min 32 s, O3). Similarly, she systematically gave instructions for collective exercises. From the second observation, the first explicit instruction lesson, the teacher gave instructions for reciprocal teaching. For example, Julie said: "Now you are going to work in pairs. So, be careful, how are we going to work in pairs? [...] You're going to get one sheet per group, that means we're going to have to work in pairs" (34 min 16 s, O3). This type of intervention was maintained during the following observations. On the other hand, during this stage, instructions for individual exercises were also given during the first three observations, whereas they were rather expected for the independent practice stage. Furthermore, an expected teaching practice during this stage was never observed, namely the instructions for a formative evaluation, whereas stereotypical checking for understanding⁶, although not expected, was systematically observed. Finally, an expected intervention, specific checking for understanding (process)⁷, was observed in the first

[5] Checking for understanding (content) usually takes the form of questions about content.

[6] Stereotypical checking for understanding is mainly in the form of closed questions such as "Do you understand?" and therefore does not really verify the students' understanding.

[7] Specific checking for understanding (process) usually involves asking students to rephrase what they have understood, which really verifies students' understanding.

and third observations only. In the first observation, the teacher used a reading method that led her to implement this teaching practice 21 times, but she was not able to maintain this teaching practice in the second and fourth observations.

Function - Sub-function	O1	O2	O3	O4
Instructions for collective exercises	4 (<1%)	2 (<1%)	7 (1%)	16 (1%)
Instructions for reciprocal teaching	0 (0%)	21 (2%)	46 (5%)	33 (3%)
Instructions for individual exercises	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Instructions for individual exercises	15 (2%)	16 (1%)	8 (1%)	0 (0%)
Stereotypical checking for understanding	21 (2%)	23 (2%)	21 (2%)	24 (2%)
Specific checking for understanding (process)	21 (2%)	0 (0%)	2 (<1%)	0 (0%)
Checking for understanding (content)	14 (2%)	59 (5%)	27 (3%)	55 (5%)
Feedback	224 (24%)	197 (18%)	233 (23%)	200 (18%)
Scaffolding	14 (2%)	10 (1%)	39 (4%)	49 (4%)
Managing student participation	136 (15%)	29 (3%)	10 (1%)	39 (3%)
Silences	<u>313 (34%)</u>	<u>459</u> (42%)	<u>438</u> (43%)	<u>473</u> (42%)
Other classroom management	<u>88 (10%)</u>	<u>197</u> (18%)	<u>138</u> (14%)	<u>184</u> (16%)
Other and inaudible	<u>75 (8%)</u>	<u>79 (7%)</u>	<u>45 (4%)</u>	<u>49 (4%)</u>
Total	925 (100%)	1092 (100%)	1014 (100%)	1122 (100%)

Numbers in *italics*: teacher's actions characteristic of guided practice

Numbers in **bold**: teacher's actions not characteristic of guided practice

Numbers underlined: actions not included in the “MSEI table”, necessary to allow a complete coding of the lesson

Table 3. Verbal interventions by the teacher during the "Guided practice" stage over the 4 observations (extract)

Implementation of the Coach's Advice

This section focuses on the implementation of the coach’s advice. It presents the results for the question: 3) Was the advice provided by the coach implemented by the teacher from one filmed lesson to the next?

All the coaching videos (CS1 to CS3) were coded with an adaptation of the “MSEI grid” for coding coaching sessions (approximately 40-60 minutes in length). This grid made it possible to code 1) each teaching practice that the coach and the teacher discussed; 2) whether the coach's advice was aimed at the teacher increasing/decreasing/maintaining the use of a teaching practice or whether it was aimed at the teacher implementing a new teaching practice in their behavioural repertoire. Non-advice comments (e.g., social exchanges, organisational exchanges about training, etc.) were not analysed. Following the coding, for each of the pieces of advice identified, their implementation during the next observation session was analysed. It should be noted that the implementation (or not) of certain advice during the next observation was unobservable. For example, the coach suggested to the teacher that she should take advantage of the periods when they were two teachers in class to do reciprocal teaching (SC3) at that time. Whether or not this advice was implemented could not be observed because, as the research states, in the filmed lessons Julie was teaching alone.

Table 4 shows, for each of the coaching sessions, the distribution of the advice according to whether it was implemented, not implemented or not observable in the next lesson.

The coach formulated between 19 pieces of advice (SC3) and 32 pieces of advice (SC2) during the coaching sessions. In total, she gave 77 pieces of advice. Of these, 43 (56%) were implemented by the teacher, 13 (17%) were not implemented by the teacher, and 21 (27%) did not address behaviour that was observable during the next observation (i.e., their possible implementation was not observable). Therefore, the majority of the coach's advice was implemented. Excluding the non-observable advice, this represents 77% of the coach's advice.

	Session 1	Session 2	Session 3	Total (all sessions)
Implemented	12 (46%)	15 (47%)	16 (84%)	46
Not implemented	8 (31%)	3 (9%)	2 (11%)	13
Not observable	6 (23%)	14 (44%)	1 (5%)	21
Total	26 (100%)	32 (100%)	19 (100%)	77 (100%)

Table 4. Distribution of pieces of advice during the three coaching sessions

Discussion

The Complexity and Multiplicity of the Teacher’s Tasks

The results of the analysis of the four observations confirm the complexity of the teaching profession and the multiplicity of tasks that a teacher must perform almost simultaneously (Doyle, 1986; 2006). Indeed, the large number of interventions (9,871 interventions by the teacher, i.e., an average of 20 interventions per minute, and 690 content-related responses by the students, i.e., an average of 1.5 interventions per minute) noted during the four observations shows that the teacher must manage the students’ learning and behaviour almost simultaneously, sometimes collectively, sometimes individually. These results also show the necessity and interest of using a case study to conduct the present research.

Explicit Instruction, a Pedagogical Approach that Comes from the Classroom, but Does Not Come Naturally

The results related to the first observation, which was a regular lesson for the teacher, show that she was not implementing, in the rigorous sense of the term, the explicit instruction approach. While some, if not many, of the components of explicit instruction were identified, the teacher was not implementing the opening of the lesson, nor was she implementing one of the three stages considered to be the “core” of explicit instruction (Rosenshine & Stevens, 1986, p. 380), namely modelling. This suggests that explicit instruction is not, in its globality, naturally acquired. In this regard, Rosenshine and Stevens (1986) indicated that components of explicit instruction (e.g., independent practice) can be observed in many classrooms, but are not always implemented adequately (e.g., little feedback is observed during independent practice). However, the fact that some components are found in Julie’s usual practice is not surprising since explicit instruction was developed from observations and experiments in classrooms (Rosenshine, 2008; 2009).

Developments in the Implementation of Explicit Instruction

The stages of explicit instruction were implemented quickly by Julie. As early as the second observation, she implemented stages (opening the lesson and modelling) that she had not implemented in the lesson she presented as a usual lesson (O1). Moreover, the implementation of the stages was refined over the course of the sessions. Indeed, while the teacher implemented each stage only once during her first explicit instruction lesson (O2), she implemented several phases of modelling and/or phases of guided practice and/or phases of independent practice during the other sessions (for example, during O3, she implemented two phases of modelling, two phases of guided practice and three phases of independent practice). The results thus illustrate the iterative nature of the approach mentioned in the writings of several authors (Bocquillon, 2020; Bocquillon et al., 2021; Kohler et al., 1997; Rosenshine & Stevens, 1986).

The analysis of the teacher's verbal interventions shows that from the first time she implemented a stage, a large number of teaching practices were adequately implemented. For example, the first modelling (O2) was characterised by 91% of the teaching practice categories being adequately implemented.

The overall positive development of the teacher's implementation of teaching practices associated with explicit instruction is in line with the findings of Hammond and Moore (2018). These authors showed that teachers supported by coaching aimed at implementing explicit instruction improved their practice over the course of five observed lessons.

However, the analysis showed that some expected actions, despite the whole PD and coaching programme, were not observed in some lessons (e.g., specific checking for understanding (process)). Some expected actions were even absent from all observations (e.g., the formative assessment of whether students were ready to move from guided practice to independent practice). This is consistent with the findings of De Jager and colleagues (2002) who observed that coached teachers had improved some of their practices but had not been able to implement all facets of explicit instruction. Julie's difficulties in implementing specific checking for understanding (process), despite the coach's advice, were consistent with the findings of Bocquillon and colleagues (2021), who found that future teachers have difficulties in implementing this teaching practice.

Implementation of Advice

Most of the advice given by the coach was followed by the teacher (77% of the coach's advice, excluding non-observable advice), which supports the value of the directive coaching method. In fact, these results are encouraging, as certain authors have previously suggested that professional development programmes have little effect on changing teachers' practices (Guskey, 2021). The results of our study are in line with those of several studies that have shown the positive effect of coaching in explicit instruction on teachers' practices (De Jager et al., 2002; Hammond & More, 2018; Kretlow et al., 2011; Morgan et al., 1994). Hammond and Moore (2018), for their part, studied the effect of directive coaching in explicit instruction during which the coach formulated advice with a view to helping teachers to change their practices. The results of their study indicated a positive effect of this type of coaching on teachers' practices.

Perspectives and Limitations

The relevance of the case study presented in this paper lies in the contributions it offers to those implementing professional development and coaching. The study was carried out on a single case in order to develop a new methodology requiring very careful observations to determine how well a teacher implements explicit instruction. Future research should replicate this methodology on a larger panel of teachers in different contexts. It would also be interesting to assess whether teachers continue to implement explicit instruction in the years following training. Similarly, it would be necessary to evaluate the PD programme according to Guskey's fifth level, i.e., to assess students' progress on standardised tests.

Conclusion

Improving the effectiveness and equity of education systems is a major challenge for societies. Based on empirical studies, it has been shown that some teaching approaches are more effective than others, however, the implementation of these practices, although very practical, is not necessarily self-evident. Therefore, it is necessary to support teachers in the development of effective teaching practices by using observation of the practices of teachers following PD programmes in order to provide feedback on their practices and, ultimately, to evaluate the effectiveness of the proposed PD programmes. The present study evaluated the implementation of explicit instruction by a teacher who participated in a practical research action (Mills & Gay, 2019) whose aim was to enable her to professionally develop, reflect on her practices and improve the situation in her school. To do this, the volunteer teacher participated in the design of a PD program involving directive coaching based on the principles of effective PD and then followed this program.

Based on observations, it was found that the teacher implemented explicit instruction with a high degree of fidelity. This implementation took place in two stages. Firstly, she implemented the stages of explicit instruction in a linear way and then in an iterative way, as recommended by scientific literature (e.g., Rosenshine & Stevens 1986). To help the teacher implement explicit instruction, the coach gave her numerous pieces of advice, 77% of which were implemented (excluding non-observable advice). In addition, this study presented an approach to observe the implementation of explicit instruction in detail. This required a modelling of explicit instruction, which was absent from the literature under consideration. The present paper therefore contributes to the research on the observation of teaching practices and the evaluation of PD programmes.

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Appendix A

The following table shows the criteria used to objectively identify each stage of explicit instruction

Opening	Presence at the beginning of the lesson of the “presentation of the objectives”; presence of checking for understanding (except stereotypical checking for understanding) or feedback on prior knowledge; presence of “getting students’ attention”; absence (or quasi-absence) of presentations (except for the presentation of the objectives and of the reason for the current lesson); absence of instructions (lesson in progress).
Modelling	Presence of a large number of presentations (all types) over several minutes and little feedback.
Guided practice	Presence of a large amount of feedback; presence of “instructions for reciprocal teaching”; presence of “instructions for formative assessment”; presence of verbal interventions for individual students (publicly) and/or pairs; presence of specific checking for understanding (process; lesson in progress)
Independent practice	Presence of “instructions for individual exercises”; presence of feedback; presence of verbal interventions to individual students (in private).
Closure	At the end of the lesson, presence of specific checking for understanding (process and content; lesson in progress); presence of feedback (lesson in progress); presence of objectives related to the next lesson.