

The Role of Teaching Materials in Educational Innovation in Early Childhood Education. Initial Reflections and Analysis of Good Practices

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Abstract. This chapter presents an initial reflection on the role of teaching materials in the process of educational innovation in early childhood education. Its main aim was to shed light on good practices at this educational level and to create a pluralistic and flexible framework based on case studies. The chapter begins by addressing the theoretical approach to four issues, namely the importance of teaching materials in early childhood education, their roles, criteria for selection of good practice case studies, and the role of teaching materials in the processes of innovation. Regarding the main stages of the project and the instruments analyzed, the paper goes on to present selected examples of good practices in early childhood education that illustrate the role given to materials and to present some initial conclusions.

Keywords: Teaching materials \cdot Educational innovation \cdot Early childhood \cdot Good practices

1 Introduction

This chapter explores selected aspects of a larger study concerning the identification, analysis, representation, and visibility of good practices in early childhood education. The overarching study intends to do so in an international (involving research teams from different countries), multicultural (looking for models that meet the characteristics of the cultural context), and multidisciplinary perspective and followed two main objectives. On the one hand, it targeted the identification, analysis, and representation of a hundred good practices in the various components and dimensions that characterize and influence early childhood education. On the other hand, it sought to establish a flexible and plural framework of the analyzed examples by tracing both the uniqueness of each example and the transferable to other examples. Linked to these two main objectives, there is a third purpose as well, namely to establish an international community of researchers and practitioners able to create strong dynamics of cooperation and exchange.

The selection of *good practice examples* happened on the grounds of preestablished criteria derived from previous research. In agreement with the institution, each of the examples and the selected practices was studied in situ by means of a triple

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approach: (1) interviews with managers and/or teachers (depending on whether it was an institutional or class-centered practice); (2) practice observation and evidence collection (recordings, products, patterned observations); (3) analysis of institutional and professional documents (educational project, learning schedules).

The team consisted of 31 researchers and six collaborators (22 women and 15 men) from seven Spanish universities. Additional international teams will work simultaneously in their own contexts in Portugal, Italy, Brazil, Argentina, Chile, Mexico, and Bolivia.

One of the essential understandings the main study rests on it questioning the idea that there may be a universal model that is effective and transferable to any situation. Consequently, the identification of *good practices* sought to find ways of responding effectively to the diverse demands of context (Benavente 2007) in a manner that satisfied participants. Along these lines, the concept of *good practices* is applicable to any field of human activity, from public policy to the specific actions of individuals. Moreover, international literature is not limited to considering the idea of *good practices* but raises the level of demand to *best practices*—to what works best in a given context. The merging concept of *best practices* has a relativizing quality, as it is not an absolute and general superlative (the best that can be done, unsurpassable), but instead is relative and contextual: the best that is done in the context to which we refer, the best that can be done in a particular framework of conditions, the best existing practices, which might even be the least negative ones.

The overall objective of the research presented in this chapter was to select, analyze, and visualize a battery of good practices in early childhood education to understand more deeply the conditions of good educational work with young children, provide adequate models, and help improve the quality at this educational stage. Thereby, special attention was dedicated to the fact whether learning activities helped teachers to carry out innovative practices in the sense of aiding curricular implementation in a way that adapts to student pace and integrates the various members of the educational community.

2 Theoretical Framework

2.1 Teaching Materials in Early Childhood Education

The definition of teaching materials for early childhood education underlying this study encompasses all resources developed for the fundamental purpose of facilitating the process of knowledge construction by students and teachers. These resources can manifest in a variety of different forms and symbolic systems. They also can serve the purposes of a program or educational project. Additional materials that were initially designed for other purposes but were attributed didactic purposes during their use are also considered to be teaching materials.

The conceptualization process first focused on the existing classifications of teaching materials for early childhood education (cf. Zabalza 1987; Romero 2003; Area 2004; Rodríguez and Montero 2002; Pascual 2006; Villalva 2006; Pérez and Malagarriga 2010). In addition, the classification of educational software as proposed by

Vidal Puga (2015) was considered: drill and practice programs, tutorial programs, programing and problem solving, simulation programs, educational games, interactive stories, multimedia books, and learning objects. The latter classification rests on the work of various authors (Cabero et al. 1993; Liguori 1995; Feria 1998; Valente 1999; Solano et al. 2001).

The main purpose of this conceptual review and terminological clarification was to address the need for a framework for example description and interpretation. Both the diversity of materials and the lack of a precise terminology in the field made a clear conceptualization necessary.

2.2 Features of Teaching Materials in Early Childhood Education

In general terms and as a guideline, following features of teaching materials in early childhood education were considered (Parcerisa 1996):

- innovation, by means of introducing new teaching material (on occasion, the change may be only superficial and not a true innovation);
- motivation by capturing students' attention;
- structuring, since each material is presented in specific ways;
- configuration of the type of relationship that students have with the learning content, seeing as each material encourages a certain type of mental activity;
- controlling of the contents to be taught;
- soliciting, seeing as materials act both as a methodological guide that organizes the training activity, and a communicative guide, since materials are a basic structural requirement of the pedagogical cultural communication;
- formative-in general or strictly pedagogic sense-since materials aid the learning of certain attitudes along their characteristics and usage;
- as a deposit of method and professionalism, since materials are precisely what close
 the curriculum and adapt more to the needs of teachers than those of students
 (especially in the case of textbooks), which explains why excessively innovative
 materials often fail. At the same time, materials determine the method and the
 performance of teachers;
- as a consumer product that is bought and sold, albeit in a unique manner because purchase is mandatory and under almost oligopolistic conditions.

In light of the above, this chapter aims to identify, analyze, and explain both the educational thinking and practices of leaders and professionals from various childhood education areas that can be described as good practices. A deeper understanding and documentation of good practices in early childhood education is expected to serve as starting point to establish the basic coordinates that characterize good educational practices so that it becomes available to supervisors and professionals working at this level, but also for those involved in initial teacher training.

3 Methods and Sample

A mixed methodology served to collect and analyze data. The three fundamental elements for the study of good practices were the personal view of the participants (the foundation of practice), the practices themselves (the visible dimension of practice), and the relationship between the two. Based on these three elements, various patterns of knowledge and experience transfer were analyzed.

Regarding the role of teaching materials, special attention was dedicated to analyzing functions that may be playing a role in the development of good practices.

The sample consisted of 50 good practice examples from early childhood education. Fur the purposes of the study presented here, a total of three good practice examples were selected.

4 Results

The three analyzed good practice examples show different ways of designing and using teaching materials.

4.1 First Good Practice Example

The *title* of the first learning experiment is Intergenerational Work in a School with 3-and 4-Year-Old Children and was dedicated to the *topic* of intergenerational work between young learners (aged 3–6) and senior citizens from the *Sar Quavitae* nursing home. Consequently, the *targeted* persons were students in the first year of early childhood education and senior citizens. Under the coordination of Lorena Martínez Seoane (*Escuelas de Educación Infantil Os Ánxeles-Brión*, preschool), the project involved several *stakeholders*, such as early education teachers, the school head, senior citizens from the nursing home, parents, and socio-educational instructors employed at the nursing home.

The project followed three main *objectives*: (1) development of intergenerational attitudes between students and the elderly; (2) promote attitudes and values relating to solidarity; and (3) contribute to the emotional and social development of the students.

The main *activities* targeted encounters between children and senior citizens. During these meetings, it was equally important to also carry out other activities, such as crafts, painting workshops, literacy activities, etc. Teaching materials played various roles. Table 1 contains details on the role and function of teaching materials for the good practice.

Overall, a considerable part of the early childhood education materials on the market show a very limited contribution to intergenerational student activities in schools. The same applies to other educational levels, such as primary education (e.g., Zapico 2012). Materials used in this case study proved helpful for the overall objectives of the research project and had following functions:

Type of material	Description	Function	Participating authors
Letter production	These are letters that the children and grandparents send to each other (The children deal with subjects involving visits, invitations or other more 'unpredictable' issues and grandparents write about the places where they come from, peculiarities of their region, etc.)	Structuring reality, as it helps to organize life experiences of both children and the elderly Motivating, catching the attention of students and seniors Innovative, by bringing new work routines into the classroom and providing an alternative to textbooks Intergenerational exchange	Teaching staff, students, and seniors Nursing home staff
Elaborated materials (murals)	Photographs of such things as meetings, trips, birthday parties of students and seniors	Motivating, catching the attention of students and seniors Stimulating, encourages contact between students, the elderly, the environment Intergenerational exchange	Students, seniors, teachers
Audiovisual documentaries		Motivating, catching the attention of students and seniors Synthesis of life experiences and activities in the nursing home and in the school jointly (on visits, parties, joint activities etc.) Structuring of reality by the particular way of presenting the experiences Intergenerational exchange	Students, seniors, teachers
Website		<i>Informative</i> , dissemination of activities	Teachers

Table 1. Teaching materials used in the first learning example (source: authors).

- innovation: facilitating intergenerational practices in the classroom that are alternatives to textbooks. In addition, it also stands for an alternative way of looking at relationships within school. In terms of organizational issues, both the school and other stakeholders were actively involved in the process;
- motivation: catching the attention of children and seniors and enabling them to approach reality in a different and attractive way;
- community work: enabling joint initiatives between the school and the community, especially the nursing home. Letters and e-mails are clear examples of resources that enabled informative and formative exchange. In addition, these materials fostered an approximation to students' contextual reality;

- structuring reality: primarily by helping to collect and organize life stories and experiences of senior citizens who participated in the initiative, and through the structuring of student experiences and activities;
- complementarity: adding new elements to the function of other materials, especially considering that intergenerational aspects are scarcely addressed in other educational resources;
- *stimulation:* induced by the exposure of students, teachers, and senior citizens to educational interests differing from those traditionally included in textbooks;
- the initiative contributed to the development of a project work methodology at school:
- the materials enabled a stronger consideration of students' reality.

4.2 Second Good Practice Example

Carrying the *title* Attention to Diversity in the Early Childhood Classroom: An Experience Based on Mathematics, the second learning example explored under the *coordination* of Patricia Cinza Sanjurjo (*Centro de Educación Infantil y Primaria Sagrado Corazón de Lugo*, preschool and primary school) the *topic* of logical-mathematical learning (i.e., numbers, quantity, differentiating geometrical shapes, and symmetry). While students (aged 5) enrolled in early childhood education were the main *target* group, other *stakeholders* involved were teachers.

The project followed two main and three specific *objectives*. General objectives were, on the one hand, to foster the comprehensive and individual development of students, and, on the other hand, to support students in the field of mathematics by doing complementary activities without using the *typical* index cards or materials. The specific objectives encompassed the reinforcement of logical-mathematical concepts (e.g., shape-background, geometric shapes, number and quantity, color), to contribute to a climate of respect during classroom activities, and to organize complementary activities in the field of mathematics.

The main *activities* covered the division of the day into a number of time slots, including entry routines, assembly, individual work, corners, snack, recess, large-group activities, workshops, and group games. A number of teaching materials contributed to identifying the roles and functions of materials as a factor of good practice concerning diversity (Table 2).

The alternatives to the textbook used in the second example supported students of different achievement levels and of different background. The differentiating alternative teaching materials offered a variety of materials to address student diversity and enable logical-mathematical learning. In generally terms, the materials served the following functions:

- innovation: alternative materials were made available. In certain cases, students became the authors of their own materials as family involvement supported material plurality;
- motivation: the diverse materials better responded to student interests;

Type of material	Description	Function	Participating authors
Games (Sudoku, clip set, making images, Tangram, number association, perceptive games)	These games are used throughout the year for different purposes and goals, especially for practicing mathematical content	Motivating, catching the attention of students Training, since the material assist the acquisition of certain skills and mathematical content. These games tend to suit the type of project that is being carried out Adaptation to students with special education needs Personal and social development, because students get used to working with different classmates	Students (receptors of materials and authors of some by painting, building, etc.) Teachers and families (by bringing in materials and using them with students)
New technologies (digital whiteboard)	It is mainly used to incorporate different types of games	Motivating Structuring reality	Students, seniors, teachers

Table 2. Teaching materials used in the second learning example (source: authors).

- evaluation: throughout the course, materials underwent evaluation by teacher observation and the analysis of learning activities. Following their introduction, evaluation assessed their efficacy and led to required changes;
- complementarity to textbooks, as most textbooks available to students contain no activities tailored for special educational needs;
- adapted: in general, the teaching materials used are low cost and originate from the Internet. The main challenges seem to be tied to printing and laminating the materials:
- the teaching materials contributed to the development of a project work methodology in the school.

4.3 Third Good Practice Example

Sandra Dios Suárez (Escola Infantil Municipal da Madalena, Ames, preschool) *coordinated* the third learning example *titled* The Elaboration of Own Materials by Teachers. The *topic* emerged from the educational project of a newly opened municipal school on educational partnership. Educational materials used in the school are developed and designed by the teachers with community participation. Thereby, the

main *target* group were students (aged 0–3), while teachers, families, the City Hall, and municipal services were other *stakeholders* involved.

The project followed no specific *objective*, as the teaching staff restrained from formulating aims. In contrast, teachers stressed that the project contributed to family participation in school activities and to informing parents about their children's learning.

The main *activities* started with teaching material design resulting from the conclusion that commercial offers were less congruent with the school's educational philosophy. Teachers designed and produced their original teaching materials during lesson planning that involved students, families, and the community. The assessment of this process involved teamwork and required rethinking the daily practice of teachers; an evaluation of family participation is also done, which is evidence for procedural student assessment. Table 3 describes the function of the teaching materials in the classroom practice in an example where teachers become educational media designers.

The third example involving the design and production of own teaching materials arose in response to the shortage of educational resources for early childhood education (students aged 0–3 years), the lack of contextual adaptation, and the methodological dissonance with existing resources. Such exercises greatly contribute to teachers' personal and professional growth. In general terms, the materials fulfilled the following functions:

- innovation: introducing collaboration between teachers and families, making the school more open to the community with an educational project built by and for the community. The design and production of own teaching materials by teachers is not an isolated event, but is instead related to the conception of the educational project by the school;
- motivation: the design and production of teaching materials is a creative process.
 The end product involves the educational professionals, families, and the local community and moves students to the center of the learning process (materials reflect the personality, skills, and the development of each child as an individual with their own identity);
- structuring students' reality, given its emphasis on the local perspective and immediate vicinity;
- contributing to a climate of tolerance and freedom;
- controlling contents: by recapitulating the work done in the classroom, the teaching materials help orientate both teachers and families in theater of each child's learning processes;
- requiring methodologies that are student-centered, project-based, organized in educational pairings in the classroom, and that continuously assess students, teachers, and schools;
- formative: acting as a learning aid;
- evaluative: teaching materials are both the process and the outcome of the formative activities, continuously assessing the learning processes and aiding the reflection on, evaluation of, and improvement of the teaching process;
- realistic: in terms of their feasibility as the materials produced are low cost with printing involving the highest cost. The economic and human resources involved are already available at the school.

Table 3. Tes	aching materials used in the t	hird learning example (source:	authors).
Type of material	Description	Function	Participating authors
Didactic material A Miña Vida en Papeis (My Life on Paper)	Book put together during the school year with students aged up to one year, for work with the course content and evidencing the maturation of each child during their first year	Innovative, involving teacher and community collaboration Motivating, because students are at the center of learning and because families are involved in the learning of their children Structuring of local reality Controlling and orientating content Formative Evaluative	Students, teachers, families
Didactic material Por un sorriso un doce (A Sweet for a Smile)	Collaborative recipe book put together during the school year with students aged 2–3, for promoting involvement by families and the municipality. It was so successful within the school community that the city published 500 copies	Innovative, involving teacher and community collaboration Motivating, because students are at the center of learning and because families are involved in the learning of their children Structuring of local reality Controlling and orientating content Formative Evaluative	Students, teachers, families, city hall
Educational project	The educational project of the school has been built and negotiated with all stakeholders (educational and service staff at schools, families, politicians, and external	Innovative, schools are open to the community Configuring a climate of tolerance and freedom Requiring didactic methods and educational organization	Students, teachers, families, city hall, community

Table 3. Teaching materials used in the third learning example (source: authors).

5 Discussion

parties)

The analysis of three good practice examples uncovered a number of core challenges. One of the central issues is the need for teaching materials to be contextualized to meet the needs of students who might otherwise be deprived of educational resources addressing their (special) needs (Braga et al. 2013; Rodríguez and Braga 2015).

All three examples integrated locally contextualized elements, which fostered the development of motivating initiatives in accordance with the needs of the classrooms under study.

The observed practices also showed that teaching staff is required to employ flexible teaching methods to adapt their teaching materials to the students' sociocultural diversity. These results are in line with the findings of numerous other studies (e.g., Parcerisa 1996; Diz and Fernández 2015; Sánchez and Castro 2015).

Another common aspect of the three examples is their main focus on the students. Moving students to the heart of the teaching and learning process enables greater personalization and inclusiveness (Sánchez and Castro 2015). As children's own activities and daily life experiences constituted the true context, they became coauthors of the materials and teachers acted as facilitators and modulators of initiatives. This, in essence, promoted project work, which is missing from many conventional teaching materials.

The examples also showed the need for training in the use of new technologies to facilitate the incorporation of complementary activities into projects. In this respect, some studies described examples and suggested solutions (cf. Guerrero et al. 2009; Romero et al. 2016).

Adaptability is another central aspect in need to be stressed. As teachers adapted their teaching materials to a great extent, students with functional challenges saw their needs met. Unfortunately, most commercial materials produced for early childhood education exhibit low levels of flexibility which makes them difficult to adapt.

With respect to the formal characteristics of teaching materials, the three analyzed examples exhibited diverse formats. Most materials aimed at a higher inclusion of more interactive elements to target greater student involvement.

Teaching materials analyzed in this study featured values (e.g., concerning intergenerational aspects) that are usually absent from commercial materials for early childhood education. These findings indicate the necessity of further research on school curricula and textbooks at early childhood and primary level concerning specific topics, such as the intergenerational relationships (Zapico 2012).

Finally, one of the key challenges lies in the lifespan of such examples as the three described in this chapter. Developing and implementing strategies to secure continuity for the individual initiatives could establish real *alternatives* to textbooks.

6 Conclusions

In a general way, the analysis of good practices uncovered several characteristics present in each one of these cases that could mean a determining factor of what good practice is. This also happens when we focus our attention on our study object: in the three described experiences we observed that teachers—by adapting textbooks or other resources, designing their own learning materials or even using a high variety of teaching resources—give a contextualized response that solves the problem of the totalization of cultural selection and social reproduction usually associated with textbooks (Gimeno 1989).

The three examples of examples also highlight that both teachers' choice of commercial teaching materials and individual material design and production are rooted in a realistic and analytical underlying ideological discourse that pays attention to students' local context and socio-cultural diversity. Visibility is given to minority groups without reproducing stereotypes (for example, through an intergenerational presence), a variety of school tasks are proposed in an attempt to adapt to educational needs and anticipate learning difficulties (for example, through continuous assessment and community involvement), and new technologies are integrated as a motivating tool (e.g., learning mathematical logic with digital resources).

In addition, teaching material design and production by teachers for their classroom activities stands for a transgression that breaks with the curricular hegemony of text-books in primary, secondary, and, increasingly, early childhood education (Martínez and Rodríguez 2010). Such practices also liberate teachers both from the curricular concretion represented by the textbook and market economic interests. Concurrently, they stimulate teachers' critical thinking and empowerment, foster their collaboration and coordination activities, and contribute to their continuing education. This professional context, where teachers take on the task of planning and evaluating learning experiences, provides great opportunities for experimentation and action research that contribute to educational innovation (Montero and Vez 1992).

Changes in modern society increased the responsibilities assigned to schools (care, custody, socialization etc.) to compensate for the challenges the family and the local community bear (Vera 2007). However, in the three examples analyzed here, educational practices and the teaching materials used are characterized by helping to establish relations between schools and their communities, generating a culture of collaboration that counteracts the trends of competition, professional isolation, and social and cultural inequality (Torres 2001).

The three examples presented here work with teaching materials that were specifically designed and selected for the early childhood education project and not the other way around. These schools are flexible and open to the community, and their school projects consider the local context as an educational content, a learning vehicle, and a partner in education. Students also participate in the educational process by playing an active role in the design of teaching materials, promoting intellectual curiosity, critical capacity, and reflection.

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