Information Literacy Instruction in Early Childhood Education: The School Museum

Instruction with primary sources promotes learner engagement and behavioural objectives. The school museum is a suitable resource for information literacy instruction in early childhood education. In this paper, we question conventional information literacy instruction. Drawing on a review of the scientific literature on information literacy and a review of educational policies, we argue that instructional innovation is needed in reading instruction in early childhood education. Based on the use of primary sources, we propose the interdisciplinary approach of the school museum as an alternative to the school library. This inquiry has implications for teacher effectiveness, student centred learning, reading motivation and the school-community relationship. Finally, we give some recommendations concerning school museum implementation and further research on the topic of school museums.

Keywords: information literacy; instruction; early childhood education; school museum; learner engagement; primary sources

Introduction

In recent decades, constant developments in technology and education have affected user instruction and led to the emergence of the concept of information literacy (Rader, 2002). Information literacy has become a core skill that pupils need to develop from early childhood. This paper aims to contribute to this field of research by presenting a potentially suitable teaching strategy to support early childhood pupils' development of information literacy abilities. The main queries raised in the study are as follow: What does it mean to be an information-literate person in the 21st century? What
role does information literacy have in early childhood education (ECE)? Is it possible to provide a tailored approach to information literacy teaching and learning in ECE?

After the 'Methodology' section, this paper is divided into five main sections. Firstly, we review scholars' definitions of information literacy and the approaches to information literacy in education policies. Secondly, we analyse the suitability of the school library as the main information source used in schools. Thirdly, we explain the relation between information literacy and material sources, which are another type of information source. Then we describe educational theories about the use of material sources in educational environments. In the fourth section of the paper, we make a comparison between school libraries and school museums (as spaces where material sources can be in storage). In the fifth section, we highlight the reasons why school museums will be of benefit to information literacy training in ECE. Finally, we describe inquiry limitations, findings, implications for research and conclusions.

Methods

This research was conducted using qualitative approach methods. The data were obtained from various sources, namely: existing bibliographic reviews, literature reviews of peer-reviewed publications, specialised books and some education policies selected as case studies. Data collection and data analysis were done simultaneously. The collected documents were approached by summarising them separately. The resulting data was gathered together and approached by synthesising. As this process continued, common ideas and key issues emerged. Likewise, distinctions between theoretical framework and policies were drawn. This process helped us develop a
deeper understanding of the perspectives of relevant concepts, theories, practices and approaches to information literacy in ECE.

From Literacy to Information Literacy

The semantic field surrounding literacy has expanded from traditional literacy to media literacy (Petrone, 2013; Potter, 2010) and transmedia literacy (Pereira et al., 2018; Scolari, 2018). As stated, information literacy is a further form of literacy based on the idea that 'to encounter knowledge is not the same as acquiring it' (McEneaney, 2015: 813). Scolari (2018) postulates that pupils should be trained in these various types of literacy according to their educational stage. As the author claims, pupils in ECE should learn information literacy, pupils in secondary education should learn media literacy, and higher education pupils should learn transmedia literacy.

The Concept of Information Literacy

Zurkowski (1974) coined the term information literacy to refer to the techniques and skills used to seek relevant information sources to find solutions to information needs. Information literacy became popular when it was classified 'within the higher literacies' and was seen as 'important to student performance, lifelong learning, and active citizenship' (American Library Association, 1989, 'Background to Report', para. 1). Information literacy is also defined as 'the capacity to access information efficiently and effectively, to evaluate information critically and competently, and to use information accurately and creatively' (Voogt and Roblin, 2012: 308). According to Bawden (2002), information literacy is the ensemble of mental skills individuals need to
access, effectively manage and ethically communicate information. In 2003, a
systematic approach to information literacy was developed. The Big6 — as it was
named — 'can be applied in all subjects, with students of all ages, and across all grade
levels' (Eisenberg and Berkowitz, 2003: 5). Also, The Big6 fosters metacognition
(Sinatra and Taasoobshirazi, 2017). According to Piloiu, information literacy
'emphasises metacognitive and conceptual understandings of information use and
information creation' (Piloiu, 2016: 78). Gonçalves (2017) presented a review of the
literature about metacognition in information literacy. It concludes that metacognitive
processes enhance information literacy learning, but claims that more research
investments are required in this area. In a more holistic definition of information
literacy, the participants in the Information Literacy Meeting of Experts in 2003
concluded that information-literate individuals contribute to nations' economic, cultural
and social development. In multilingual and multicultural contexts, information-literate
societies are crucial to reducing disparities and promoting understanding and tolerance
within themselves (Thompson, 2003). The Alexandria Proclamation of 2005 affirms
that information literacy 'empowers people in all walks of life to seek, evaluate, use and
create information effectively to achieve their personal, social, occupational and
educational goals' (Garner, 2006: 3) and it is 'more than a library or education issue. It is
crucial to issues of economic development, health, citizenship and quality of life'
(Garner, 2006: 5). In recent years, information literacy has played a fundamental role in
preparing learners for global citizenship (Lee, 2020; Torres & Bosio, 2020; UNESCO,
2014):
Information literacy allows individuals to acquire and develop their understanding of the world around them; to reach informed views; where appropriate, to challenge, credibly and in an informed way assumptions or orthodoxies (including one's own), and even authority; to recognise bias and misinformation; and thereby to be engaged citizens, able to play a full part in democratic life and society. Information literacy helps to address social exclusion, by providing disadvantaged or marginalised groups with the means of making sense of the world around them and participating in society. In a global environment where 'fake news' has become a recognised term, an ability to display critical judgement about multiple information sources, particularly online, is crucial. Whether in relation to conventional news outlets, social media, internet searches or simply information communicated orally, information literacy helps to reach views about the reliability and authority of information sources. In these ways, too, information literacy reinforces democracy and civic engagement (Coonan et al., 2018: 4).

Information Literacy in Educational Policies

As noted, recent literature strongly suggests that information literacy concerns both academic and value-related skills. Then, how do educational policies outline the acquisition of information literacy in ECE?

Developing information literacy skills appears as one fundamental target from the earliest stages of pupils' intellectual development (Department for Education [United Kingdom], 2013; Kansas State Department of Education [USA], 2016; Ministry
It is particularly remarkable that, similar to scholarly literature, educational policies seem to agree that pupils should train both academic skills (to seek information, evaluate it, communicate it, etc.) and value-related skills (criticism, ethics, tolerance, etc.). Secondly, special attention must be paid to the fact that the main resource to train information literacy skills cited in education policies is the school library. Nevertheless, how can ECE pupils learn information literacy, considering they cannot fully read and write in the conventional sense yet (Clay, 1966, 2019; Gillen and Hall, 2013; Sulzby, 1985)?

These two issues reveal that information literacy instruction is a big challenge to ECE teachers because it must apply to both academic and daily life of pupils. According to Korda (2019),

Educators around the world are recognising that traditional ways of teaching are not meeting the needs of students in our rapidly changing world. How can we genuinely transform education to foster the skills and capacities our youth will need in the future? (2019: 39)
Therefore, it seems appropriate to provide ECE schools with a paradigm that facilitates the growth of information-literate individuals from the earliest stages. Facing this reality may change the information literacy teaching and learning paradigm in ECE.

**Information Literacy and the School Library: Pros and Cons**

As seen, the idea of an information-literate pupil has evolved to suit the current context. However, questions remain: Why is the use of the school library still the main resource in information literacy teaching and learning? Are school librarians the only school members responsible for teaching information literacy? These questions have been unanswered, so they are explored in this section.

School libraries are a core tool for information literacy training as cross-curricular spaces for information acquisition where students can access information and other learning resources in all curricular areas and subjects (Bernal et al., 2011, as cited in Blasco and Durban, 2012; Mahwasane, 2017; Piloiu, 2016). In general, school libraries are tasked with dual purposes related to information literacy: providing students with direct access to information in all curricular areas and instructing students in using and managing information favoured by their intellectual and critical educational fields. Consequently, school librarians have a crucial role as the persons in charge of instructing students how to manage information in the library environment (Rader, 2002). School libraries and school librarians are both considered to be indispensable supports for research projects and educational actions in all curricular areas. School libraries, therefore, are perceived as 'natural and cultural space[s]' (Petit, 2008: 158) for advancing the appropriate, effective, ethical use of information.

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1 In this paper, the term *school librarian* also refers to *media specialist*.
Nonetheless, it is unclear whether school libraries are totally suitable for ECE pupils to train their information literacy skills. At this age, most students have not mastered reading and writing (Graham and Kelly, 2019). The question then arises: Is there any other path through which ECE pupils' acquisition of information literacy can be understood? Certainly, an approach other than accessing print sources appears to be more appropriate. Children need an information literacy approach more sensitive to their abilities, interests and needs. So what should the paradigm of teaching and learning information literacy in ECE be?

The paradigm of Information Literacy Instruction in Early Childhood Education

A literature review by Rader (2002) showed that from 1990 to 2000, 'tremendous growth [occurred] in publications related to information literacy globally' (2002: 242). Unfortunately, these publications have almost exclusively focused on higher education. We, therefore, decided to conduct a scoping review (Grant and Booth, 2009) in the Scopus and Web of Science databases to detect subsequent literature focused on ECE. Our findings confirmed those of Rader (2002): studies in the information literacy field specifically aimed at ECE remain scarce. Because of the lack of studies referring to potential paradigms in training ECE pupils to become information-literate individuals, and considering our 15 years of professional and teaching experience in preschool and primary teacher education, we are confident that a paradigm shift in ECE's information literacy training is necessary. This new paradigm should be based on any form of literacy besides the use of written texts. In this sense,
we advocate for 'reading' material sources as the most suitable approach for the teaching and learning of information literacy in ECE. Material sources are information sources with which the youngest pupils can practice information literacy skills regardless of their literacy levels. In fact, material sources have long been used in ECE, but their usage as teaching and learning resources is neither systematised nor legislated. Consequently, the next step of our research was to review the theoretical framework on the use of material sources in educational environments and to analyse the most suitable theories for the suggested paradigm shift.

Information Literacy and Teaching and Learning with Material Sources

Zurkowski (1974) stated that information-literate students 'have learned techniques and skills for utilising the wide range of information tools as well as primary sources in moulding information solutions to their problems' (1974: 6). These primary sources of information alluded to by Zurkowski (1974) include artefacts, objects, monuments, illustrations, journals, letters, legal documents, recordings and any other material sources created contemporaneously with the eras or events about which they provide information. Material sources convey first-hand information and evidence about events for learners to understand their social, historical and economic contexts. These sources also provide access to non-written information and help understand past and present events. The use of artefacts helps pupils 'overcome negative social positioning and become what Bourdieu (1991) might call "legitimately" literate' (Bartlett, 2004: 3). Material sources serve as learning tools from early childhood; indeed, babies begin exploring the world by interacting with the objects around them. The development of
competencies begins in the vicinity of lived experiences—at home, in the school' (Piloiu, 2016: 83). This concept of learning beyond the classroom provides a view on what an information-literate individual is in the modern world.

Material sources are relevant to how pupils develop their information literacy skills, especially in ECE. Material sources convey information about human beings: their needs, conventions, norms, values, practices, relationships, traditions, beliefs and past and current societies, among other aspects. This conveyance is possible as material sources are the result of a series of deliberate actions imprinted on them by the social groups that design, develop, use and commercialise them (García Blanco, 1994). Material sources thus usually have higher reliability than other information sources as they were created for functional purposes, not as testimonies perpetuating certain memories of the past (MacGregor, 2012). Material sources have been mainly studied from the perspectives of three educational currents: object-based learning, artifactual critical literacy and museum-based learning.

Object-Based Learning

Object-based learning has a long tradition in pedagogy, specifically in the 18th-century ideas of Pestalozzi (1999) and Rousseau (2011) who advocated a practical, intuitive, experimental, sensorial approach to learning. This approach gave considerable importance to material sources of information as they could be analysed simply through the senses from the first educational stages. In the late 19th century, those theories led to what became known as leçons de choses (lessons of things; Buisson, 1911; Pape-Carpantier, 1900). Here, it is worth noting that the two main objectives of the leçons de
chooses were: (1) to improve reading and writing skills; and (2) to foster knowledge and deep thinking about events, society and nature (Sánchez Ramón, 2006). In other words, the leçons de choses began to define information literacy. The concept of object-based learning coined by Paris (2002) centres on the alignment of five fields that meet the human need to understand and relate to the world: museum studies, anthropology, psychology, elementary/primary education and educational philosophy. Early childhood educators should emphasise the importance of object study and the value of educational experiences based on objects (Paris, 2002).

Artifactual Critical Literacy

Artifactual critical literacy 'is an approach that combines a focus on objects and the stories attached to them, with an understanding of how different stories have different purchase in particular locations' (Pahl and Rowsell, 2011: 129). The main activity in artifactual critical literacy is to enhance talking, writing and reading skills through the use of material sources as each artefact has a story that may serve functional learning.

Artifactual critical literacy, in part, emerges from critical literacy, which draws together poststructuralist, postmodernism, critical pedagogy and critical discourse analysis, among other fields. Artifactual critical literacy assumes that oft-used texts in education present political and ideological contents that, although usually hidden, perpetuate discourses of power and social control (Cassany and Castellà, 2010). Another source of critical literacy is new literacy studies, which argues that literacy should be studied from not only cognitive perspectives but also historical, cultural,
social and institutional perspectives (Collins and Blot, 2003; Janks, 2010). Artifactual critical literacy also emerges from multimodality (Kress, 1997), the expression of meanings in different modes. 'Everyday objects, which we call artifacts, can be critical in supporting this process' (Pahl and Rowsell, 2011: 130). Artefacts are fundamental to meaning-making as they can link pupils with their closest environments, families and communities, enabling students to interpret cultural events and read the ideas behind them (Pahl and Rowsell, 2011).

Museum-Based Learning

Museum-based learning theory claims that 'an important group of potential learners at many museums or exhibitions is any community directly related to the objects on display' (Lord, 2007: 15). Museum-based learning thus consists of learning about one's own cultural identity. Museum-based learning is partially cognitive but primarily affective learning as it focuses on students' feeling about objects (e.g. their attitudes, interests, appreciation, beliefs and values). Accordingly, 'it is correct to refer to a successful museum learning experience as a transformative one' (Lord, 2007: 16). That is to say, pupils transform their initial opinions, attitudes or valuations after seeing the evidence (objects) which constitutes the story the museum tells.

The Natural Space for Objects in Educational Centres: The School Museum

As seen, object-based learning, artifactual critical literacy and museum-based learning address (from different perspectives) the educational potential of material sources. In our research, we are proposing to fit the three theories together to improve
pupils’ information literacy when they cannot yet fully read and write in the conventional sense. Firstly, object-based learning consists of using artefacts and objects (material sources) as an educational tool. Secondly, *artifactual* critical literacy promotes critical literacy through objects and the stories attached to them. Thirdly, museum-based learning focuses on transforming the stories that museums tell through objects into functional learning. An information literacy teaching and learning approach based on the use of material sources, therefore, seems to be appropriate. As stated, the use of material sources in ECE is common, but has not been systematised. This leads us to think that, as the school library is the natural space for written sources in the school, the school museum\(^2\) should be the natural space for material sources. Against this backdrop, the school museum presents a suitable approach to systematise the use of material sources in ECE.

**School Libraries and School Museums:** Two Facilities, One Target

It is important to note that we do not intend to replace school libraries with school museums. Stapp (1984) thoroughly compared museums and libraries and concluded that both have public responsibilities in educating an information-literate society. The author established terms of similarity between the institutions: 'As equal and parallel repositories of the public memory, the library and the museum have public responsibilities' (Stapp, 1984: 3). However, she also pointed to a major difference: the education system attempts to foster library literacy—as shown in the 'Information Literacy in Educational Policies' section—but seems to be exempt from the duty of fostering museum literacy. Also comparing museums and libraries, Lord (2007) found

\(^2\) Also called in-school museum and museum school.
that learning about a subject in museums and libraries has a self-motivated character. Learning from print material consists of learning what others say about a subject, whereas libraries are perceived as useful and 'helping' (Lord, 2007: 25) institutions.

Applying Stapp's (1984) and Lord's (2007) ideas to the field of formal education, school libraries and school museums are equally important to foster information literacy. They are equally responsible for training information-literate individuals. First, both school libraries and school museums foster skills such as observing, comparing, understanding, inferring non-written information, encouraging oral expression and discussion and developing abstract thinking and memory and language and problem-solving skills (Durbin et al., 1996; Prats and Santacana, 2011). Second, in both school libraries and school museums, pupils can access information sources from diverse geographical places and historical periods, which facilitates direct contact with cultures and social groups and encourages critical attitudes towards established discourses (Pahl and Rowsell, 2011). Both facilities are spaces where school communities can establish links with their social environments. Third, both school libraries and school museums enable the creation of multidisciplinary, interdisciplinary and transdisciplinary learning projects as both books and objects can be used in all curricular areas.

In sum, the alternative approach we suggest does not exclude school libraries. On the contrary, we assume that the implementation and utilisation of school museums in combination with school libraries can constitute an appropriate method to prepare ECE pupils for today's information environment. We hope to address this assumption in future studies.
The innovation: School Museums and their role in Early Childhood Education

Studies on school museums are lacking in the body of literature about ECE. While discussing the state of the art in school museums is not the aim of this paper, it is the topic of another research project on which we are working. In an attempt to define school museums, we can state that they are collections of objects and artefacts (ideally and as much as possible) created by pupils, hosted in school buildings and used for educational and didactic purposes. School museums can be placed in large spaces such as school libraries or simply in closets. Pupils are encouraged to bring material sources for school museums, so their collections are not necessarily permanent. The material sources in school museums may also be donated by teachers, families, collectors and the school community and environment. As a last resource, educational centres can buy the material sources for the school museum. Whether each material source is an original or replica should always be indicated to avoid misunderstandings.

There are countless cases of schools carrying out educational activities based on artifactual critical literacy, object-based learning and museum-based learning. A large body of evidence found in grey literature shows that the most frequently practised activity in all education stages is temporary museum exhibitions curated by pupils (D'Acquisto, 2013; Muñoz, 2012; Pahl et al., 2013; Authors, 2016; Ryder, 2016). Consequently, there are grounds supporting the educational benefits of emulating museums as a teaching and learning method, and school teachers are aware of these benefits. Why not then create and use school museums in ECE?
School museums should not replace field trips to local museums. On the contrary, school museums better prepare children to interact and learn in museums. Communicating with material sources to analyse their hidden information and meanings helps ECE pupils (1) learn a new communication practice and (2) express meanings in different modes, which relates to the concepts of multimodality and meaning-making previously explored. The school museum approach thus appears to be reasonably appropriate for meeting the needs, interests and challenges of ECE pupils in information literacy specifically and skills development in general.

**Discussion**

This section is divided into four subsections: Limitations, Findings, Implications for Research and Conclusions.

**Limitations**

The limitations of the present research include the impossibility of reviewing all existing educational policies. The volume of data would make analysis and interpretation too time-consuming. Secondly, no pilot project for school museums has been implemented at the time of writing, so the full potential of the approach has not been proved empirically, indicating a need to launch pilot projects for school museums in ECE centres. More significant insights into school museum implementation could yield useful information about the strengths and weaknesses of the approach.
Findings

Learning to be information literate in the 21st century involves more than handling information; it also encompasses high-level thinking skills important to cognitive development (Bawden, 2002; Thompson, 2003; Sinatra and Taasoobshirazi, 2017). The acquisition of information literacy skills is of utmost importance in ECE (Graham and Kelly, 2019), but few studies in the information literacy field are aimed at this education stage (Rader, 2002). These results highlight that little is known about information literacy teaching and learning in ECE; indeed, school libraries are the only resource mentioned in curricula. However, given the literacy development stage of ECE pupils, school libraries might not be the most suitable resource for ECE (Graham and Kelly, 2019).

In contrast, material sources are an educational resource employed in all disciplines and curricular areas, particularly in ECE (Pahl and Rowsell, 2011; Lord, 2007). This fact highlights school museums' potential usefulness, but the scientific literature does not record any examples of school museums in ECE; therefore, we assume that little use has been made of their potential. The key benefit of working with material sources is that pupils engage in a metacognitive approach to learning (Piloiu, 2016). Pupils thus acquire knowledge by drawing their own conclusions, and in doing so, they are trained to apply their critical thinking skills to the information they encounter, which makes them feel empowered to develop and communicate their own viewpoints. Together, these findings confirm that school museums are a school practice that can connect reason and emotion in ECE pupils and facilitate their development as information-literate individuals as they simultaneously learn about the concepts of
identity, ethics, citizenship and criticism. These results suggest that our approach is a promising alternative to school libraries, leading to the implications discussed in the next section.

Implications for Information Literacy Research and Instruction

This study on instructional innovation is the first to propose the school museum approach to teaching and learning information literacy in ECE. To promote the same level of recognition for school museums as school libraries, school museums should be subjected to organisational and usability criteria and run by specialised professional teaching staff. Inclusion of school museums in school projects could result in pioneering actions in the educational field.

The next step of this research is to implement a pilot school museum in at least one ECE centre. Based on the test results, future empirical studies could be designed to determine the operational framework that ensures best practices in school museums. Other topics that warrant further investigation are the design, implementation and management of school museums as school facilities. Relevant questions are: How should material sources be registered, classified and preserved? Which guidelines should teachers follow to get the most out of school museums? What roles are played in school museums by the school community (e.g. teachers, staff, students, school administrators, families, neighbourhoods, businesses, organisations, cultural institutions, local authorities and other educational centres)? These questions have implications for researchers and professionals exploring alternative and new perspectives in their work with ECE pupils. Their answers could take the form of
Conclusions

School museums can forge new paths in reading instruction in ECE and increase teacher effectiveness in teaching and learning information literacy to ECE pupils. Material sources encourage information literacy teaching and learning even for pupils in developmental stages in which they have not (partially or fully) developed reading competence. The principle underpinning the school museum approach to information literacy in ECE is that pupils from birth to 6-8 years old primarily relate to the world through objects and artefacts. ECE pupils thus are more likely to develop information-handling skills through material sources than written texts. The school museum approach can also prepare ECE pupils for 21st-century citizenship in which information literacy is fundamental. Ultimately, the school museum approach holds great potential as a proper, effective information literacy development approach in ECE, and a great scope for research remains in this area.

Declaration of Conflicting Interest

The authors declare that there is no conflict of interest.

Funding

Secretariat for Universities and Research of the Ministry of Business and Knowledge of the Government of Catalonia.
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