education sciences

MDPI

Article

Building Vocabulary Bridges: Exploring Pre-Service Primary School Teachers' Dispositions on L2 Vocabulary Instruction for Emergent Bilinguals through Interactive Book Reading

Eline Decraene [1,*], Silke Vanparys [1], Maribel Montero Perez [2] and Hilde Van Keer [1]

[1] Department of Educational Studies, Faculty of Psychology and Educational Sciences, Ghent University, 9000 Ghent, Belgium; silke.vanparys@ugent.be (S.V.); hilde.vankeer@ugent.be (H.V.K.)
[2] Department of Linguistics, Faculty of Arts and Philosophy, Ghent University, 9000 Ghent, Belgium; maribel.monteroperez@ugent.be
* Correspondence: eline.decraene@ugent.be

Abstract: A strong vocabulary is crucial for language acquisition and can profoundly influence academic and societal success. Interactive book reading (IBR) offers an effective approach for vocabulary instruction as it provides a dynamic and engaging word-learning context. However, as children progress from preschool to primary grades, the emphasis on IBR declines, despite the persistent need for comprehensive literacy education, particularly for emergent bilinguals. This study aims to uncover the reasons underlying the diminishing use of IBR and focuses on the dispositions (i.e., knowledge and beliefs) of pre-service teachers regarding L2 vocabulary instruction during IBR with emergent bilinguals. Semi-structured interviews were conducted with 36 pre-service teachers in Flanders. Thematic analysis revealed a foundational knowledge base for vocabulary instruction during IBR, with most beliefs aligning with scientific evidence. Nevertheless, some beliefs contradicted research findings, particularly concerning the deliberate use of IBR to achieve specific learning objectives, harnessing students' home languages and fully realizing IBR's potential for optimal vocabulary acquisition. Furthermore, preconditions at the class, school, educational policy and parental levels emerged as crucial factors for effectively implementing vocabulary instruction during IBR. These findings serve as pivotal starting points for further refining pre-service teacher education and developing in-service professional development in Flanders.

Keywords: vocabulary instruction; emergent bilinguals; interactive book reading; pre-service teachers

check for updates

Citation: Decraene, E.; Vanparys, S.; Montero Perez, M.; Van Keer, H. Building Vocabulary Bridges: Exploring Pre-Service Primary School Teachers' Dispositions on L2 Vocabulary Instruction for Emergent Bilinguals through Interactive Book Reading. *Educ. Sci.* **2023**, *13*, 1220. https://doi.org/10.3390/educsci13121220

Academic Editors: Oksana Afitska, Nur Ehsan Mohd Said and Fred Dervin

Received: 8 October 2023
Revised: 23 November 2023
Accepted: 4 December 2023
Published: 7 December 2023

Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Literacy is a prerequisite for participation in our current knowledge society. An increasing number of children, henceforth referred to as emergent bilinguals, are growing up in a region where the language of instruction (L2) differs from their home language (L1). Emergent bilingual children are a very diverse group, for whom L2 vocabulary acquisition is often a challenging process [1]. Compared with their monolingual peers, emergent bilinguals often have a less extensive vocabulary repertoire in L2 [2–4]. This is worrisome, since vocabulary knowledge is one of the core foundations for language proficiency and an important predictor for further language development and academic and societal success [1,2]. Emergent bilinguals primarily encounter L2 at school, which places a significant responsibility on their teachers [5]. In line with previous research, the present study advocates interactive book reading (IBR) as a didactic approach for enhancing emergent bilinguals' vocabulary development [6–13]. Despite the demonstrated importance of rich contextualized vocabulary instruction in the primary grades, attention to IBR diminishes both in practice and in research beyond the preschool age [14–19]. The present study aims to uncover the reasons underlying the diminishing use of IBR by exploring the knowledge and beliefs (i.e., dispositions) of pre-service primary school teachers regarding the use

of IBR for vocabulary instruction for emergent bilinguals. In doing so, this study seeks to address a frequently overlooked element in teacher professionalization, i.e., teachers' underlying knowledge and beliefs [5,20,21] to uncover impeding and promoting factors for L2 vocabulary instruction during IBR.

1.1. Effective Vocabulary Instruction for Emergent Bilinguals

In the field of L2 vocabulary instruction and learning, word learning experiences can be classified along a continuum ranging from incidental learning to intentional learning. With incidental vocabulary learning, words are presented within a specific context and children are expected to deduce the meaning through inference. Intentional vocabulary instruction refers to providing clear explanations of word meanings [22]. For emergent bilinguals to acquire L2, intentional vocabulary instruction is crucial, since incidental learning alone is insufficient to account for the number of words children need to learn [2,23]. Four key characteristics for effective vocabulary instruction specifically targeted towards emergent bilinguals are highlighted: (1) ensuring frequent and repeated exposure to target words, (2) providing definitions and meanings in meaningful contexts, (3) fostering opportunities for discussion and interaction [2,24–26] and (4) using multimodal approaches (i.e., "providing children with information through multiple means, including music, songs, pictures, physical activities and gestures") [2] (p. 18).

In recent years, increasing attention has been paid to a fifth characteristic, i.e., leveraging emergent bilinguals' L1 as a resource for L2 vocabulary development [3,7,9,10]. This is grounded in the language interdependence theory, stating that proficiency in L1 and L2 is interrelated [27]. For vocabulary in particular, research shows that children with strong L1 skills show significantly more vocabulary growth in L2 than children with limited L1 skills [7,28,29]. Building on the language interdependence theory, functional multilingual learning has been put forward as an approach in which emergent bilinguals' L1 is used in a strategic, integrated and transversal way across the curriculum to enhance the learning of a new language and new content [30]. Functional multilingual learning can occur through spontaneous actions (e.g., translations by peers into their L1), class routines (e.g., translating assignments into L1 with translation tools), pedagogical organization (e.g., creating homogeneous groups based on students' L1) or through the planned and integrated use of L1 for specific tasks (e.g., a project where L1 use is encouraged). The development of L1 is therefore no pedagogical goal itself but a steppingstone or scaffold toward the acquisition of a new language [31].

1.2. Interactive Book Reading as an Approach for Effective Vocabulary Instruction

A recent systematic review focusing on vocabulary interventions for young emergent bilingual children has demonstrated the effectiveness of utilizing storybooks as valuable tools for teaching vocabulary [32]. Among the various didactic approaches using storybooks, one that aligns with all key characteristics for effective vocabulary instruction is known as IBR. IBR is a language-stimulating approach that promotes story-based interaction between the teacher and the children, as well as among the children themselves. IBR is typically divided into three distinct phases: a phase prior to reading aloud (e.g., discussing book conventions or making predictions about the story), the reading-aloud phase itself and a phase after reading aloud (e.g., follow-up discussions or processing activities). During these phases, interaction is elicited by asking open-ended questions, which encourages in-depth discussions about the story and its relevance to the children's real-life experiences. Furthermore, feedback and reinforcement are provided, and the teacher follows up on the children's responses to give depth to the conversation [25,33].

IBR creates a rich environment for vocabulary acquisition. When words are not explicitly defined, reading provides opportunities for incidental learning, enabling children to deduce word meanings from contextual and visual cues. Moreover, intentional vocabulary learning takes place during IBR because target words are explained and interaction over the target words is encouraged [34]. IBR is a flexible technique that can be adapted to

the diverse language needs of children and is, therefore, feasible to implement with a diverse group of emergent bilinguals [35]. In this respect, utilizing emergent bilinguals' full linguistic repertoires during reading aloud has been shown to be beneficial for acquiring a new language [5,7–10]. This can be realized by, among other things, vocabulary bridging, which involves explaining L2 target words in L1 to "bridge" to vocabulary acquisition in L2 [7,8]. By doing so, emergent bilinguals' L1 can be exploited in a functional way to acquire L2 [30].

1.3. The Importance of (Pre-Service) Teachers' Dispositions

Since emergent bilinguals are mainly acquiring L2 at school, competent teachers that create rich language learning environments play an extremely important role [5]. However, education still fails to close the language gap between emergent bilinguals and their monolingual peers. For some emergent bilinguals, the gap between their monolingual peers even widens throughout their school career [36,37]. Research shows, for example, that teachers use fewer complex sentences and diverse vocabulary during reading aloud with multilingual children compared with reading aloud with monolingual children [38]. Similar findings were observed by Vanparys, Debeer Vanparys, Debeer [39], who discovered that at-risk children had lower levels of child input and the adult reader made less attempts to actively engage at-risk children during IBR. One of the four characteristics used in their study to define at-risk children referred to being an emergent bilingual. In other words, it can be assumed that teachers tailor their language use to children's language proficiency, whereby lower expectations lead to less rich language learning opportunities for emergent bilinguals. This is an important concern, since the complexity and diversity of teachers' language input is related to children's L2 vocabulary development [38,40].

A first step to address teachers' language use involves acknowledging and acting on teachers' underlying dispositions, i.e., their knowledge and beliefs about vocabulary instruction during IBR for emergent bilinguals. Teachers' dispositions are important to take into account, since they are closely related to teachers' instructional behavior in class [41]. However, in the context of IBR, most studies are primarily concerned with changing teachers' actual IBR behavior, whereas few studies focus on the first step in view of sustainable changes in teacher behavior, namely optimizing their underlying knowledge and beliefs [5,20,21]. Nevertheless, the relationship between teachers' beliefs and IBR implementation was demonstrated in a recent study with bilingual preschool teachers. The findings revealed a positive association between teachers' beliefs regarding shared book reading with emergent bilinguals after participating in an intervention and emergent bilinguals' vocabulary acquisition in L2. These results confirm the importance of teachers' beliefs as the underlying base for sustainable implementation of instructional practices [42].

Teachers' knowledge and beliefs about teaching emergent bilinguals remain unclear in the literature. While some studies show that teachers do not consider the use of emergent bilinguals' L1 as confounding or impeding [43], the majority of the studies point to the limited knowledge that teachers possess regarding L2 acquisition [44] and regarding instructional practices to incorporate emergent bilinguals' L1 [43]. Moreover, some teachers even hold on to conceptions that are not in line with research findings [45]. For example, some teachers struggle to see the benefits of multilingual classes since they believe that using languages other than L2 will reduce and hamper the learning process [44] or that it requires a large amount of skills and training for the teacher [46]. Furthermore, teachers frequently report low self-efficacy beliefs regarding teaching emergent bilinguals [45].

Since the present study focuses on IBR as a didactic approach for vocabulary instruction, the focus is on teachers' pedagogical content knowledge (PCK) (i.e., "how to make the subject, vocabulary, understandable to others") [47]. Moreover, teachers' beliefs are operationalized as their perceptions or perceived satisfaction regarding the use of IBR as an instructional approach to promote emergent bilinguals' L2 vocabulary development [42,48]. A first stage in laying the foundations for competent teachers is pre-service teacher education [49]. Teacher education plays an important role by preparing pre-service

teachers through initial formal learning opportunities about teaching emergent bilinguals and leveraging children's full linguistic repertoires as a resource in education [50,51]. Upon completion of teacher education, teachers are expected to possess foundational knowledge, skills and beliefs that align with theory, enabling them to build their teaching practice [52]. Since knowledge and beliefs are crucial factors affecting teachers' skills and class behavior [41], the present study will focus primarily on mapping pre-service primary school teachers' PCK and beliefs in vocabulary instruction for emergent bilinguals through IBR. The focus on primary school teachers is grounded in the decline in IBR implementation after preschool, while the limited studies set up in the primary grades demonstrate the relevance of (interactive) book reading to increase primary school children's language proficiency [14–16,19].

2. Materials and Methods

2.1. Research Context

The present study took place in Flanders, the Dutch-speaking part of Belgium, where the language of instruction is Dutch. The large majority of teachers in Flanders are primarily Dutch-speaking. This is in stark contrast to the linguistic diversity of the student population, with around 24% of primary school children not speaking Dutch at home, with French, Arabic, Turkish, Romanian, English, Polish and Berber [53] as the most common foreign home languages.

2.2. Participants

Thirty-six pre-service primary school teachers participated in the study. The sample included 83.3% female and 16.7% male pre-service teachers (which is consistent with the gender distribution of primary school teachers in Flemish education), with an average age of 21.28 years (SD = 1.09). All pre-service teachers attended the third and final year of teacher training at Flemish university colleges. While several countries have programs specifically designed to teach the instructional language as a second or new language, such programs do not exist for primary education in the Flemish region. Therefore, all student teachers attended the general professional bachelor "teacher primary education". All pre-service teachers had Dutch as L1, four of them in combination with another language (i.e., English, French or sign language).

2.3. Instrument and Procedure

Semi-structured interviews were conducted to gather in-depth insights and information on preservice primary school teachers' PCK and beliefs on vocabulary instruction for emergent bilinguals through IBR. The interview protocol consisted of open-ended questions. The questions on PCK focused on approaches the participants deemed appropriate for vocabulary instruction with emergent bilinguals in general and in the context of IBR in particular. Based on Wolf Wolf [48] and in line with Pollard-Durodola, Gonzalez Pollard-Durodola, Gonzalez [42], the questions on beliefs focused on whether preservice teachers believed that (1) vocabulary instruction for emergent bilinguals should be a priority, (2) IBR with emergent bilinguals is feasible to implement in practice and (3) IBR will improve emergent bilinguals' L2 vocabulary development. Before starting the interview, the interviewer received active informed consent from all participants. All interviews were audio-recorded.

2.4. Data Analysis

All interviews were transcribed verbatim and analyzed via thematic analysis [54] in Nvivo 12. In the coding process, we initiated by aligning with the themes emphasized in the existing literature (see Figure 1 theme 1–4). Within these themes, we coded for PCK and beliefs. Furthermore, an inductive approach was employed, allowing us to organically identify emerging themes from the data. To assure objectivity and meaningful organization of the data in a semantic way, 25% of the data were double-coded by a second independent

researcher, which was the upper limit of the 10–25% interval recommended for double coding [55]. Intercoder reliability was calculated and resulted in a Cohen's kappa of 0.82, indicating a "nearly perfect" agreement between both coders [56].

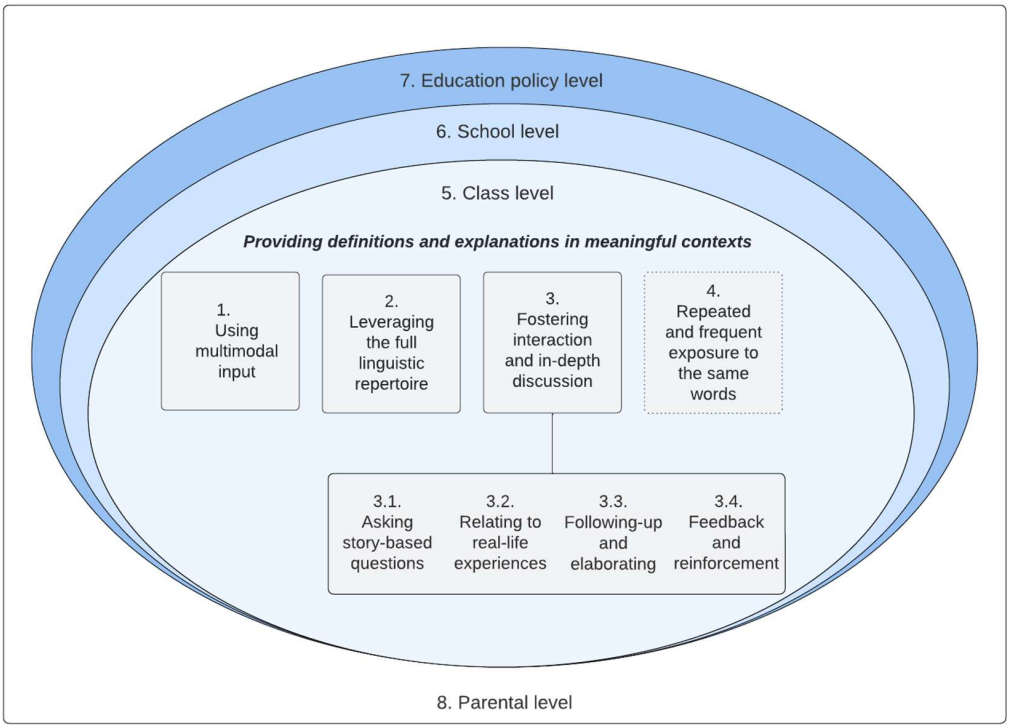


Figure 1. Themes, including both PCK and beliefs, on vocabulary instruction during IBR.

3. Results and Discussion

Figure 1 presents an overview of the themes explored in the interview data. Themes 1 to 4 align with the prevailing characteristics on vocabulary instruction (during IBR) found in the existing literature and discussed in the introduction section (see Sections 1.1 and 1.2). Theme 1 to 3 were addressed by the participants to varying degrees, while theme 4 (i.e., repeated and frequent exposure to the same words) was mainly absent in pre-service teachers' responses (see dotted line). Themes 5 to 8 emerged from the inductive analysis, revealing preconditions for the effective implementation of vocabulary instruction during IBR on the class, school, education policy and parental level.

3.1. Providing Definitions and Explanations in a Meaningful Context

There was consensus among pre-service teachers regarding the importance of teaching L2 vocabulary to emergent bilinguals by providing definitions and explanations. Notwithstanding the prevailing positive beliefs regarding the relevance of vocabulary instruction, thirteen participants indicated that teaching vocabulary through IBR cannot always be the main priority. In this regard, they referred to the numerous curriculum objectives to be accomplished by the end of the school year, highlighting time constraints. Participant 3 illustrated this as follows: "If you do it on a daily basis, it can take up a lot of time. I think sometimes I would opt for finishing a math lesson properly and skip the reading aloud".

In response to direct inquiries, all pre-service teachers expressed their belief in the efficacy of IBR to teach and acquire L2 vocabulary. In addition to vocabulary outcomes, several other benefits of IBR were identified by the participants, including stimulating children's reading comprehension, reading motivation, attentiveness, imagination, knowledge of different cultures and broader social and emotional development. However, during in-depth conversations concerning the practical integration of IBR into daily practice, eleven participants showed that they considered IBR a supplementary activity, often relegated to moments of surplus time disconnected from the primary educational objectives.

"The benefits of IBR... The children learn new words faster. (...) They absorb new information very quickly. (...) The children get more speaking opportunities. (...) They show more understanding of the story. (...) But when I think of all the things that I consider important in education, reading aloud is something extra on top of what you already have to do according to the attainment targets" (Participant 8).

This conception is not in line with research findings and fails to acknowledge IBR's inherent value to achieve crucial learning goals [5–7,57]. To effectively integrate vocabulary instruction in class (in the context of IBR), several approaches were put forward by the participants that will be discussed below.

3.2. Providing Multimodal Input

Nineteen pre-service teachers demonstrated a considerable amount of PCK on providing multimodal input (i.e., combining various modes of information delivery) in view of general L2 vocabulary instruction techniques. The most frequently mentioned form of multimodal input involved auditory input (e.g., verbal articulation by the teacher or music), along with visual representations of word meanings (e.g., pictograms, images, physical activities or using body language) and/or written forms (e.g., written text, glossaries or picture dictionaries). Approaches in which words are offered in isolation and without context were mentioned only to a limited extent. The pre-service teachers valued both intentional vocabulary instruction, where teachers directly explain word meanings (e.g., using picture dictionaries) and incidental vocabulary learning, where children infer word meanings (e.g., reading aloud without word explanations).

Regarding the specific context of IBR, pre-service teachers stressed the added value of presenting words in the context of a storybook due to the interconnectedness of the vocabulary with the specific theme and pictures of the storybook. Ten participants highlighted going beyond the inherent multimodal characteristics of reading storybooks aloud (i.e., auditory input from the reader and visual input from pictures and text), for example, by bringing additional pictures or by incorporating real objects related to the story's content to enhance the reading experience.

3.3. Levering Emergent Bilinguals' Full Linguistic Repertoires

The majority of the pre-service teachers mentioned both advantages (n = 34) and disadvantages (n = 25) of leveraging emergent bilinguals' L1 for L2 vocabulary instruction. The most frequently discussed benefit of incorporating emergent bilinguals' L1 was the perceived positive impact on their well-being and motivation, expecting them to feel accepted, valued and confident. A notable tension arose regarding the impact of L1 use on L2 vocabulary acquisition. Eighteen pre-service teachers indicated that incorporating emergent bilinguals' L1 significantly contributed to their L2 development, as Participant 19 articulated: "I think it is necessary to use L1 because otherwise you eliminate their foundation. If you neglect their L1, students cannot build on their foundation and will not learn L2 as easily." However, participants were also convinced that (too much) L1 use hindered L2 vocabulary growth (n = 17) and others expressed concerns about emergent bilinguals becoming overly reliant on L1 translations (n = 7), resulting in reduced motivation and effort for learning the L2. Additionally, a dichotomy was observed in the responses of the participants regarding the proposed role of L1. Whereas the majority of the pre-service teachers acknowledged the value of L1, they emphasized L2 development as the primary instructional goal. In contrast, only two participants mentioned the importance of preserving L1 during the interviews, acknowledging its role in shaping a child's identity and its potential benefits for future language development. In line with their beliefs, participants demonstrated considerable PCK about leveraging L1 (during IBR). The predominant approach cited by all 36 participants involved translating key words to build bridges between two languages, as illustrated by Participant 10, who argued that it was important to "make sure they can link the word in L2 to the concept in L1, because then it is more likely to stick". This recommendation is in line with previous research that

showed that vocabulary bridging (i.e., leveraging L1 as a resource or bridge to broaden the understanding of L2) during IBR is indeed related to L2 vocabulary acquisition [8].

In shaping their beliefs on multilingualism, research shows that teachers draw on learning opportunities from pre- and in-service training, as well as from their own experiences in teaching emergent bilinguals [50]. Since most pre-service teachers in the present study had little experience in teaching emergent bilinguals (e.g., only occasionally during an internship), they mainly relied on the insights and expertise acquired through their pre-service teacher education programs (n = 22). In this respect, most participants acknowledged the value of learning about the use of L1 and its role in facilitating L2 learning. This, however, is not always in line with school policies, which often adopt a rather restrictive approach (i.e., only allowing students to use L2 at school). Furthermore, there was a disparity among participants regarding the adequacy of their teacher training in addressing the reality of linguistic diversity encountered in schools. While some participants felt well-prepared, others expressed concerns about the insufficiency of their training in effectively addressing the diverse linguistic needs of emergent bilinguals. They indicated that the insights they gained from teacher education were mainly suited for dual language contexts. In dual language contexts, teachers understand the home languages of their students, which is mostly not the case in the superdiverse classes in Flanders. More attention to integrating emergent bilinguals' L1 while acknowledging the fact that teachers often do not master emergent bilinguals' home languages [30] into the teacher education curriculum is therefore recommended.

In addition, impediments to deploying emergent bilinguals' L1 were also cited during the interviews. Thirty participants mentioned the concern of not understanding emergent bilingual children when they use their home language, which may lead to emotions such as vulnerability, powerlessness, stress and distrust. In this regard, some pre-service teachers are convinced that emergent bilinguals should possess the basics or some prior knowledge of L2 before being able to participate in IBR. It can be inferred from this finding that extended vocabulary instruction in the context of IBR, for example, during the pre- and post-reading phase, was mainly not acknowledged by the participants. During extended vocabulary instruction, teachers can, among other things, pre-teach vocabulary to the children or the children can participate in additional processing activities, thus enhancing opportunities for acquiring new words [58,59]. This could also be related to the previously reported time constraints, where it is important to emphasize that IBR and its three phases can be used to work on goals other than vocabulary, such as socio-emotional, socio-cognitive and narrative skills [57]. To address the language barrier, the use of digital translation applications, videos in L1, multilingual teacher aides or support from multilingual parents were mentioned. Moreover, the functional use of emergent bilinguals' L1 was put forward, whereby meaning negotiation takes place in multiple languages. For example, children who share the same L1 can engage in interactions using their L1 and subsequently rephrase their ideas in the language they share with the teacher [60]. This was also indicated by Participant 2: "If you have both high-achieving and low-achieving students who speak the same L1, the high-achieving students can assist their peers by utilizing L1. This can be particularly beneficial when it is too difficult in L2. In such cases, the high-achieving student can serve as a translator or an explainer".

The second concern arose from the belief that paying attention to emergent bilinguals' needs or incorporating multiple home languages in class may negatively affect monolingual children (n = 10). In this regard, some pre-service teachers perceived it difficult to provide additional support for emergent bilinguals while ensuring a meaningful experience for their monolingual peers. Concerns were raised regarding the potential discrepancy in pace. More particularly, participants feared that accommodating the learning needs of emergent bilinguals might result in a slower pace and reduced level of difficulty that could lead to boredom among monolingual children. Some participants expressed concerns that incorporating L1 in class could result in a sense of exclusion among monolingual peers who do not understand the language or fear the reaction of monolingual children's parents.

It was notable that some participants clearly viewed it as problematic when a monolingual student was faced with incomprehension, while this was less prominently problematized for emerging bilinguals, although approaches to increase their understanding were certainly mentioned. However, the majority of pre-service teachers believed that embracing multilingualism in class broadens the perspectives of monolingual children and fosters empathy for the experiences of emergent bilinguals. By recognizing and navigating this tension, educators can strive to create an inclusive classroom environment that promotes mutual understanding and optimal learning experiences for both emergent bilinguals and monolingual children.

3.4. Fostering In-Depth Discussions and Interaction during IBR

Varied beliefs emerged regarding the appropriate depth and complexity level of conversations with emergent bilingual children. On the one hand, 21 pre-service teachers believed in setting challenging expectations and acknowledged the importance of in-depth discussions and interactions during IBR. In line with these beliefs, pre-service teachers demonstrated PCK on how to foster in-depth conversations by following up and elaborating on children's responses by seeking clarifications and explanations (e.g., "What would happen next?" or "Why would that be?"). While participants did not explicitly mention providing feedback to emergent bilinguals, clarification requests and negotiation of meaning were examples of feedback during interaction [61]. Encouragement and reinforcement of children during interaction was noticeably absent in the responses of the preservice teachers in the present study, notwithstanding its importance in keeping children actively involved [62]. This could possibly indicate a lack of PCK, but it was also possible that participants considered it too obvious to mention. Furthermore, participants displayed PCK on connecting the content of the story to children's real-life experiences. They mentioned creating meaningful connections between the story and the children's lives, for instance, through personal inquiries, exploring past experiences and prompting predictions about their own reactions in similar situations.

To foster in-depth discussions and interactions, pre-service teachers discussed various levels of abstraction when asking questions, ranging from a low level of cognitive demand to a high level of cognitive demand. Questions with a low level of cognitive demand are literal directly observable questions, while questions with a high level of cognitive demand are questions whose answers cannot be directly found but need to be inferred. This demonstrates PCK in embedding a diverse range of open-ended questions [63]. In addition, participants believed that asking questions during IBR facilitated individual opportunities to speak, enabling emergent bilinguals to practice their expressive vocabulary and develop confidence in speaking. However, the interview data revealed that they mainly focused on teacher questions rather than on the promotion of peer discussions. This is in line with previous research showing that the adult provided about twice as much input as the children during IBR, and this preponderance was even larger when reading aloud to children at a high risk of language delay [39].

Divergent beliefs surfaced regarding the appropriate level of vocabulary complexity for use in IBR. Several participants mentioned strategies to reduce the complexity of vocabulary learning, for example, by placing greater emphasis on visual aids and even by considering the omission or substitution of difficult words. The latter, however, raises concerns, as it might hinder the exposure to rich language, which is crucial for acquiring new vocabulary [38,40].

"Omitting certain challenging words can be more beneficial because children often do not use these challenging words themselves. Books occasionally incorporate words that are not commonly used in everyday life. In such cases, it may not be appropriate to introduce these words to children, as they may not find much practical value in them" (Participant 1).

3.5. Frequent and Repeated Exposure to the Same Words

The importance of frequent and repeated exposure to the same words for vocabulary development was notably absent in pre-service teachers' responses despite its well-documented value in the literature [2,24–26]. Several participants demonstrated PCK in proactively teaching challenging words and assigning tasks and activities that allow students to further practice vocabulary, for instance, purchasing various types of fruits at a store. However, pre-service teachers did not provide specific examples of such activities within the context of IBR. It is necessary to draw attention to the three phases of IBR and to establish a connection between the broader scope of IBR and the educational goals that can be achieved. By doing so, teachers can create more meaningful opportunities for frequent and repeated exposure to the same words in the context of IBR, which may possibly lead to increased vocabulary acquisition. The added value of repeated readings, a method that allows children to encounter the same target words repeatedly and acquire a deeper understanding [8], was also overlooked in this regard, which may possibly indicate a lack of knowledge about how IBR can be even more effective in terms of vocabulary development. It is possible that the interviewers did not sufficiently prompt relevant information in this respect. Future research could address this by employing mixed-method research methodologies and by including classroom observations to provide a more comprehensive insight into teachers' competence.

3.6. Preconditions

The participants articulated the belief that effective vocabulary instruction during IBR with emergent bilingual children necessitated several key preconditions. These preconditions can be categorized into four levels of responsibility: the class level (with a focus on the pivotal role of individual teachers), the school level (entailing the establishment of school-wide policies), the macro-level educational policy level and the parental level.

Regarding the class level, the ideal group composition for IBR was a theme often discussed by the participants (n = 22). Some advocated heterogeneous groups, where language-proficient students could support their less proficient peers. Conversely, others suggested creating homogeneous groups based on L2 proficiency to foster a supportive and comfortable learning environment. However, concerns were raised about the potential limitation of peer-to-peer learning in such groups. Additionally, forming homogeneous groups based on students' L1 to facilitate mutual support during IBR was proposed, but reservations were also expressed, cautioning against potential demotivation among emergent bilinguals who might feel excluded based on their L1. These contrasting viewpoints underscored the complexity of group composition in IBR.

Regarding the school level, the interviews revealed that teachers considered it essential to work toward a coherent school policy that transcends the class level and thus the responsibility of individual teachers (n = 15). Pre-service teachers emphasized the need for shared decision making with the entire school team, rather than individual autonomy, especially when considering the use of L1 as a steppingstone towards L2 vocabulary acquisition. This can be attributed to the frequent discouragement or prohibition of L1 use at the school and educational policy level, as indicated by several pre-service teachers. In both Flemish policy and practice, there remains a prevailing assumption that exposing emergent bilinguals exclusively to the dominant language represents the most effective approach for language acquisition, despite empirical evidence contradicting this assumption [64]. While the rather monoglossic orientation in our education system does not consistently facilitate this, participants emphasized the importance of creating an inclusive environment where children feel welcomed and where all home languages are valued. They also emphasized the importance of the physical classroom space, such as a cozy and aesthetically pleasing reading corner, to foster inclusivity and encourage active participation. As children advance in age, there is a perceived decrease in the attention that is given to maintaining a decorated reading corner. In addition, participants emphasized selecting the right timing for IBR

activities, preferably allocating fixed and calm periods that foster regularity and allow children to mentally prepare.

Furthermore, regarding the macro-educational policy level, participants believed that multiple teachers in one class would enhance the implementation of vocabulary instruction during IBR (n = 15). In this regard, concerns were raised regarding the way Flemish education is usually organized, particularly pointing to the demanding task of being the sole instructor in front of an entire class. Fifteen pre-service teachers anticipated challenges in effectively regulating student behavior (e.g., creating equal speaking opportunities for all children, verbal conflicts and excessive questioning by the children) during IBR. While recognizing the benefits of employing IBR in small group settings, challenges related to class management (e.g., dividing their attention among different groups) might occur. To address these concerns, the enhanced implementation of co-teaching, involving multiple teachers in collaborative instruction to distribute instructional responsibilities, was proposed. However, the teacher shortage in Flanders and the high student-to-teacher ratios in classrooms present considerable challenges for the practical implementation of team teaching. This highlights the need for more agile and responsive educational policies.

Moreover, preconditions on the parental level were also addressed. More particularly, five pre-service teachers delegated the responsibility for L2 acquisition to emergent bilinguals' parents, as Participant 23 illustrated: "If parents are not interested in learning L2, the children will not be interested either. They will adopt the same behavior and will not understand the value of learning L2". However, this conception is not in line with research findings, since parents of emergent bilinguals were no less involved in their children's education compared with parents of monolingual peers [65]. Furthermore, the usually well-intended advice by educators, advocating for the utilization of L1 within the home environment, may result in a reduction in the development of a child's L1 skills. This, in turn, can have repercussions on their abilities in L2 [66]. Other pre-service teachers in the study had a different view on parents' roles, perceiving them as supportive agents in class to incorporate emergent bilinguals' L1.

4. Conclusions

The primary objective of this study was to investigate pre-service teachers' PCK and beliefs regarding vocabulary instruction for emergent bilinguals within the context of IBR. The findings revealed a unanimous acknowledgment among participants regarding the importance of intentional L2 vocabulary instruction for emergent bilinguals, with IBR being generally perceived as a feasible approach. While many characteristics of teachers' PCK and beliefs aligned with the existing literature and theory, notable gaps were also identified.

Particularly, aspects such as encouraging and reinforcing children, as well as providing frequent and repeated exposure to target words during IBR, were insufficiently acknowledged by the participants during the interviews. To address these deficiencies and to enhance vocabulary instruction for emergent bilinguals, professionalization initiatives should extend their focus to the often-overlooked pre- and post-reading phases of IBR. Encouraging children to interact with target words in varied contexts, both within and beyond the immediate narrative, is a strategic approach to foster language development. Additionally, the current study highlights the pivotal role of leveraging emergent bilinguals' L1 as a resource for learning. Functional multilingual learning [30], as identified in the literature, holds promise for overcoming language barriers and hesitant beliefs expressed by participants during interviews regarding L1 use in teaching emergent bilinguals.

The study also captured participants' perceptions on the effectiveness of IBR to improve emergent bilinguals' L2 vocabulary development. While participants believed in the effectiveness of IBR for promoting L2 vocabulary, the relegation of IBR to moments of surplus time was a prevailing perception. Leveraging IBR as more than a leisure activity is crucial for maximizing its potential. In addition to vocabulary outcomes, it is imperative to emphasize IBR as an approach to obtain various other educational goals as well, such as

socio-emotional, socio-cognitive and narrative skills [56], which was acknowledged by the majority of the participants during the interviews.

The findings of this study underscore preconditions for effective vocabulary instruction for emergent bilinguals at various levels, encompassing not only the teacher level but also extending to the school level and educational policy. These preconditions are primarily related to a thoughtful and endorsed (home) language policy and smaller class groups or multiple teachers in the classroom. Therefore, comprehensive professionalization demands a broader perspective that goes beyond individual teachers, involving the entire school team. Policy changes play a central role in fostering shared decision making and achieving institutional alignment with language education objectives. By embracing a collaborative approach, professionalization can create an inclusive and supportive language learning environment, nurturing a culture of shared vision and commitment to educational excellence for all children.

While this qualitative research enriched the understanding of pre-service teachers' PCK and beliefs regarding vocabulary instruction for emergent bilinguals within the context of IBR, future research addressing the same research questions could prioritize the use of mixed methods, combining interviews with, for example, Likert-scale questionnaires. Mixed-method research is expected to yield more robust results, allowing for more comprehensive insights. Furthermore, supplementing these approaches with class observations offers a deeper understanding of teachers' instructional behavior. Class observations serve to verify the alignment between teachers' professional knowledge and beliefs on the one hand and the implementation of these aspects in their teaching practices on the other.

Author Contributions: Conceptualization, E.D.; methodology, E.D.; validation, E.D.; analysis, E.D.; data curation, E.D.; writing—original draft preparation, E.D.; writing—review and editing, E.D., H.V.K., M.M.P. and S.V.; visualization, E.D.; supervision, H.V.K. and M.M.P.; project administration, E.D., H.V.K. and M.M.P.; funding acquisition, E.D., H.V.K. and M.M.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Research Foundation Flanders, grant number 11E1523N.

Institutional Review Board Statement: The study was conducted in accordance with the ethical rules presented in the General Ethical Protocol of the Faculty of Psychology and Educational Sciences of Ghent University.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data consists of Dutch-language transcriptions and codes, making it unavailable for sharing.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

References

1. Monsrud, M.-B.; Rydland, V.; Geva, E.; Thurmann-Moe, A.C.; Halaas Lyster, S.-A. The advantages of jointly considering first and second language vocabulary skills among emergent bilingual children. *Int. J. Biling. Educ. Biling.* **2022**, *25*, 42–58. [CrossRef]
2. Butler, Y.G. Teaching vocabulary to young second-or foreign-language learners: What can we learn from the research? *Lang. Teach. Young Learn.* **2019**, *1*, 4–33. [CrossRef]
3. Jackson, C.W.; Schatschneider, C.; Leacox, L. Longitudinal analysis of receptive vocabulary growth in young Spanish English—Speaking children from migrant families. *Lang. Speech Hear. Serv. Sch.* **2014**, *45*, 40–51. [CrossRef] [PubMed]
4. Lervåg, A.; Aukrust, V.G. Vocabulary knowledge is a critical determinant of the difference in reading comprehension growth between first and second language learners. *J. Child Psychol. Psychiatry* **2010**, *51*, 612–620. [CrossRef] [PubMed]
5. Grover, V.; Rydland, V.; Gustafsson, J.E.; Snow, C.E. Do teacher talk features mediate the effects of shared reading on preschool children's second-language development. *Early Child. Res. Q.* **2022**, *61*, 118–131. [CrossRef]
6. Batini, F.; Luperini, V.; Cei, E.; Izzo, D.; Toti, G. The association between reading and emotional development: A systematic review. *J. Educ. Train. Stud.* **2021**, *9*, 12–50. [CrossRef]
7. Lugo-Neris, M.J.; Jackson, C.W.; Goldstein, H. Facilitating vocabulary acquisition of young English language learners. *Lang. Speech Hear. Serv. Sch.* **2010**, *41*, 314–327. [CrossRef]

8. Leacox, L.; Jackson, C.W. Spanish vocabulary-bridging technology-enhanced instruction for young English language learners' word learning. *J. Early Child. Lit.* **2014**, *14*, 175–197. [CrossRef]
9. Méndez, L.I.; Crais, E.R.; Castro, D.C.; Kainz, K. A culturally and linguistically responsive vocabulary approach for young Latino dual language learners. *J. Speech Lang. Hear. Res.* **2015**, *58*, 93–106. [CrossRef]
10. Restrepo, M.A.; Morgan, G.P.; Thompson, M.S. The efficacy of a vocabulary intervention for dual-language learners with language impairment. *J. Speech Lang. Hear. Res.* **2013**, *56*, 748–765. [CrossRef]
11. Brouillard, M.; Dube, D.; Byers-Heinlein, K. Reading to bilingual preschoolers: An experimental study of two book formats. *Infant Child Dev.* **2022**, *31*, e2294. [CrossRef]
12. Yang, D.; Xia, C.; Collins, P.; Warschauer, M. The role of bilingual discussion prompts in shared E-book reading. *Comput. Educ.* **2022**, *190*, 104622. [CrossRef]
13. Christ, T.; Cho, H. Emergent bilingual students' small group read-aloud discussions. *Lit. Res. Instr.* **2023**, *62*, 203–232. [CrossRef]
14. Biemiller, A.; Boote, C. An effective method for building meaning vocabulary in primary grades. *J. Educ. Psychol.* **2006**, *98*, 44. [CrossRef]
15. Greene Brabham, E.; Lynch-Brown, C. Effects of teachers' reading-aloud styles on vocabulary acquisition and comprehension of students in the early elementary grades. *J. Educ. Psychol.* **2002**, *94*, 465. [CrossRef]
16. Penno, J.F.; Wilkinson, I.A.; Moore, D.W. Vocabulary acquisition from teacher explanation and repeated listening to stories: Do they overcome the Matthew effect? *J. Educ. Psychol.* **2002**, *94*, 23. [CrossRef]
17. Cetinkaya, F.C.; Ates, S.; Yildirim, K. Effects of Interactive Book Reading Activities on Improvement of Elementary School Students' Reading Skills. *Int. J. Progress. Educ.* **2019**, *15*, 180–193. [CrossRef]
18. Merga, M.K. Interactive reading opportunities beyond the early years: What educators need to consider. *Aust. J. Educ.* **2017**, *61*, 328–343. [CrossRef]
19. Sung, H.-Y. Togetherness: The benefits of a schoolwide reading aloud activity for elementary school children in rural areas. *Libr. Q.* **2020**, *90*, 475–492. [CrossRef]
20. Lorio, C.M.; Woods, J.J. Multi-component professional development for educators in an Early Head Start: Explicit vocabulary instruction during interactive shared book reading. *Early Child. Res. Q.* **2020**, *50*, 86–100. [CrossRef]
21. Rezzonico, S.; Hipfner-Boucher, K.; Milburn, T.; Weitzman, E.; Greenberg, J.; Pelletier, J.; Girolametto, L. Improving preschool educators' interactive shared book reading: Effects of coaching in professional development. *Am. J. Speech-Lang. Pathol.* **2015**, *24*, 717–732. [CrossRef]
22. Hulstijn, J.H. Incidental and intentional learning. In *The Handbook of Second Language Acquisition*; Doughty, C.J., Long, M.H., Eds.; Blackwell: Malden, MA, USA, 2003; pp. 349–381. [CrossRef]
23. Yeung, S.S.; Ng, M.L.; Qiao, S.; Tsang, A. Effects of explicit L2 vocabulary instruction on developing kindergarten children's target and general vocabulary and phonological awareness. *Read. Writ.* **2020**, *33*, 671–689. [CrossRef]
24. Marulis, L.M.; Neuman, S.B. How vocabulary interventions affect young children at risk: A meta-analytic review. *J. Res. Educ. Eff.* **2013**, *6*, 223–262. [CrossRef]
25. Mol, S.E.; Bus, A.G.; De Jong, M.T. Interactive book reading in early education: A tool to stimulate print knowledge as well as oral language. *Rev. Educ. Res.* **2009**, *79*, 979–1007. [CrossRef]
26. Steele, S.C.; Mills, M.T. Vocabulary intervention for school-age children with language impairment: A review of evidence and good practice. *Child Lang. Teach. Ther.* **2011**, *27*, 354–370. [CrossRef] [PubMed]
27. Cummins, J. Linguistic interdependence and the educational development of bilingual children. *Rev. Educ. Res.* **1979**, *49*, 222–251. [CrossRef]
28. Grøver, V.; Lawrence, J.; Rydland, V. Bilingual preschool children's second-language vocabulary development: The role of first-language vocabulary skills and second-language talk input. *Int. J. Biling.* **2018**, *22*, 234–250. [CrossRef]
29. Pham, G. Pathways for learning two languages: Lexical and grammatical associations within and across languages in sequential bilingual children. *Biling.: Lang. Cogn.* **2016**, *19*, 928–938. [CrossRef] [PubMed]
30. Sierens, S.; Van Avermaet, P. Language diversity in education: Evolving from multilingual education to functional multilingual learning. In *Managing Diversity in Education: Languages, Policies, Pedagogies*; Multilingual Matters: Bristol, UK, 2014; pp. 204–222.
31. Foster, N.; Auger, N.; Van Avermaet, P. Multilingual tasks as a springboard for transversal practice: Teachers' decisions and dilemmas in a Functional Multilingual Learning approach. *Lang. Educ.* **2021**, *37*, 22–38. [CrossRef]
32. Kong, N.Y.; Hurless, N. Vocabulary interventions for young emergent bilingual children: A Systematic review of experimental and quasi-experimental studies. *Top. Early Child. Spec. Educ.* **2023**, *43*, 17–29. [CrossRef]
33. Barnes, E.M.; Dickinson, D.K.; Grifenhagen, J.F. The role of teachers' comments during book reading in children's vocabulary growth. *J. Educ. Res.* **2017**, *110*, 515–527. [CrossRef]
34. Damhuis, C.M.; Segers, E.; Verhoeven, L. Sustainability of breadth and depth of vocabulary after implicit versus explicit instruction in kindergarten. *Int. J. Disabil. Dev. Educ.* **2014**, *61*, 194–211. [CrossRef]
35. Fitton, L.; McIlraith, A.L.; Wood, C.L. Shared Book Reading Interventions With English Learners: A Meta-Analysis. *Rev. Educ. Res.* **2018**, *88*, 712–751. [CrossRef]
36. Driessen, G.; Van der Slik, F.; De Bot, K. Home language and language proficiency: A large-scale longitudinal study in Dutch primary schools. *J. Multiling. Multicult. Dev.* **2002**, *23*, 175–194. [CrossRef]

37. Foorman, B.R.; Petscher, Y.; Herrera, S. Unique and common effects of decoding and language factors in predicting reading comprehension in grades 1–10. *Learn. Individ. Differ.* **2018**, *63*, 12–23. [CrossRef]
38. Aarts, R.; Demir-Vegter, S.; Kurvers, J.; Henrichs, L. Academic language in shared book reading: Parent and teacher input to mono-and bilingual preschoolers. *Lang. Learn.* **2016**, *66*, 263–295. [CrossRef]
39. Vanparys, S.; Debeer, D.; Van Keer, H. What's the Difference? Interactive Book Reading With At-Risk and Not-At-Risk 1st-and 2nd-Graders. *J. Res. Child. Educ.* **2023**, 1–22. [CrossRef]
40. Aukrust, V.G. Young children acquiring second language vocabulary in preschool group-time: Does amount, diversity, and discourse complexity of teacher talk matter? *J. Res. Child. Educ.* **2007**, *22*, 17–37. [CrossRef]
41. Blömeke, S.; Gustafsson, J.-E.; Shavelson, R.J. Beyond dichotomies: Competence viewed as a continuum. *Z. Für Psychol.* **2015**, *223*, 3. [CrossRef]
42. Pollard-Durodola, S.D.; Gonzalez, J.E.; Saenz, L.; Soares, D.; Davis, H.S.; Resendez, N.; Zhu, L.N. The Social Validity of Content Enriched Shared Book Reading Vocabulary Instruction and Preschool DLLs' Language Outcomes. *Early Educ. Dev.* **2022**, *33*, 1175–1197. [CrossRef]
43. Duarte, J.; Günther-van der Meij, M. 'Just accept each other, while the rest of the world doesn't'–teachers' reflections on multilingual education. *Lang. Educ.* **2022**, *36*, 451–466. [CrossRef]
44. De Angelis, G. Teachers' beliefs about the role of prior language knowledge in learning and how these influence teaching practices. *Int. J. Multiling.* **2011**, *8*, 216–234. [CrossRef]
45. Geerlings, J.; Thijs, J.; Verkuyten, M. Teaching in ethnically diverse classrooms: Examining individual differences in teacher self-efficacy. *J. Sch. Psychol.* **2018**, *67*, 134–147. [CrossRef]
46. Gartziarena, M.; Villabona, N.; Olave, B. In-service teachers' multilingual language teaching and learning approaches: Insights from the Basque Country. *Lang. Educ.* **2023**, 1–15. [CrossRef]
47. Shulman, L.S. Those who understand: A conception of teacher knowledge. *Am. Educ.* **1986**, *10*, 43–44.
48. Wolf, M.M. Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart 1. *J. Appl. Behav. Anal.* **1978**, *11*, 203–214. [CrossRef]
49. Rossi, P.G.; Magnoler, P.; Mangione, G.R.; Pettenati, M.C.; Rosa, A. Initial Teacher Education, Induction, and In-Service Training: Experiences in a Perspective of a Meaningful Continuum for Teachers' Professional Development. In *Facilitating In-Service Teacher Training for Professional Development*; IGI Global: Hershey, PA, USA, 2017; pp. 15–40.
50. Pohlmann-Rother, S.; Lange, S.D.; Zapfe, L.; Then, D. Supportive primary teacher beliefs towards multilingualism through teacher training and professional practice. *Lang. Educ.* **2023**, *37*, 212–228. [CrossRef]
51. Ricklefs, M.A. Variables influencing ESL teacher candidates' language ideologies. *Lang. Educ.* **2023**, *37*, 229–243. [CrossRef]
52. Baier, F.; Decker, A.T.; Voss, T.; Kleickmann, T.; Klusmann, U.; Kunter, M. What makes a good teacher? The relative importance of mathematics teachers' cognitive ability, personality, knowledge, beliefs, and motivation for instructional quality. *Br. J. Educ. Psychol.* **2019**, *89*, 767–786. [CrossRef] [PubMed]
53. Flemish Department of Education. Leerlingenkenmerken. 2023. Available online: https://www.vlaanderen.be/statistiek-vlaanderen/onderwijs-en-vorming/leerlingenkenmerken (accessed on 1 August 2023).
54. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [CrossRef]
55. O'Connor, C.; Joffe, H. Intercoder reliability in qualitative research: Debates and practical guidelines. *Int. J. Qual. Methods* **2020**, *19*, 1609406919899220. [CrossRef]
56. Landis, J.R.; Koch, G.G. The measurement of observer agreement for categorical data. *Biometrics* **1977**, *33*, 159–174. [CrossRef] [PubMed]
57. Grøver, V.; Snow, C.E.; Evans, L.; Strømme, H. Overlooked advantages of interactive book reading in early childhood? A systematic review and research agenda. *Acta Psychol.* **2023**, *239*, 103997. [CrossRef] [PubMed]
58. Coyne, M.D.; McCoach, D.B.; Loftus, S.; Zipoli, R., Jr.; Kapp, S. Direct vocabulary instruction in kindergarten: Teaching for breadth versus depth. *Elem. Sch. J.* **2009**, *110*, 1–18. [CrossRef]
59. Oxley, E.; De Cat, C. A systematic review of language and literacy interventions in children and adolescents with English as an additional language (EAL). *Lang. Learn. J.* **2021**, *49*, 265–287. [CrossRef]
60. Rosiers, K.; Willaert, E.; Van Avermaet, P.; Slembrouck, S. Interaction for transfer: Flexible approaches to multilingualism and their pedagogical implications for classroom interaction in linguistically diverse mainstream classrooms. *Lang. Educ.* **2016**, *30*, 267–280. [CrossRef]
61. Oliver, R.; Mackey, A. Interactional context and feedback in child ESL classrooms. *Mod. Lang. J.* **2003**, *87*, 519–533. [CrossRef]
62. Ping, M.T. Group interactions in dialogic book reading activities as a language learning context in preschool. *Learn. Cult. Soc. Interact.* **2014**, *3*, 146–158. [CrossRef]
63. Kleeck, A.V.; Gillam, R.B.; Hamilton, L.; McGrath, C. The relationship between middle-class parents' book-sharing discussion and their preschoolers' abstract language development. *J. Speech Lang. Hear. Res.* **1997**, *40*, 1261–1271. [CrossRef]
64. Van Avermaet, P. Meertaligheid versus Nederlands op school Een valse tegenstelling. *Caleidoscope* **2020**, *32*, 16–28.

65. Harper, S.N.; Pelletier, J. Parent involvement in early childhood: A comparison of English language learners and English first language families. *Int. J. Early Years Educ.* **2010**, *18*, 123–141. [CrossRef]
66. Cummins, J. *Rethinking the Education of Multilingual Learners: A Critical Analysis of Theoretical Concepts*; Multilingual Matters: Bristol, UK, 2021; Volume 19.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.