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The development of a Polish pre-literacy manual based on action research evidence

Summary

There is a quantity of research in English speaking countries into the relationship between early oral language concepts and literacy. The research described in this paper attempted to transfer to the Polish language context the knowledge developed in English speaking countries on pre-literacy developmental norms. The aim of the study was also to increase children's educational chances through an intervention program addressing pre-literacy concept deficit. As part of the research into Polish pre-literacy developmental norms and the teacher development program, a resource book was created with pre-literacy concepts and activities sequenced developmentally according to current knowledge about how Polish children develop their skills in these areas. The textbook developed from a collaborative process between the researchers and pre-school teachers during the collection of pre-literacy developmental norm data and regular collaborative workshops focused of planning and implementing intervention programs with the use of explicit methodologies and formative assessment.

Keywords: pre-literacy, pre-numeracy, Polish developmental norms, preschool

Introduction

Over the last 20 years, longitudinal research in English literacy and numeracy have demonstrated the importance of pre-literacy and numeracy skills in developing later reading and writing skills. These studies have established significant correlations between the development of emergent oral language concepts and literacy and numeracy skill development

(Bishop, Adams 1990; Catts 1993; Catts i in. 2002; Clements i in. 2011; Dickinson i in. 2003; Justice i in. 2009; Justice i in. 2002; Pasnak i in. 2007; Prior i in. 2011). Also Polish educational experts have noted the importance of pre-literacy and numeracy concepts for developing literacy and numeracy skills in Polish children. Brzezińska (1987) reported that readiness to read and write encompasses lexical-conceptual readiness in addition to emotional-psychomotor and motivational factors (Brzezińska 1987: 44). Thus, the pre-school teacher must develop these concepts of spoken language that are vital for learning literacy skills, otherwise the acquisition of writing is difficult or even impossible (Radwiłowicz, Morawska 1986). Radwiłowicz and Morawska (1986) noted that if a child has difficulties in acquiring reading and writing skills in school, then difficulties will result in the acquisition of complex concepts through communication. In other words, low scores in later general school achievements may have been caused by learners' failure to acquire firm literacy and numeracy skills in early school years, which may have been caused by their poor lexical-conceptual readiness to learn to read and write. Research conducted by the authors in four Lubuskie rural pre-schools indeed showed that a number of children exhibited a narrow range of concepts pertinent to development of literacy and numeracy skills. Therefore the main problem this article attempts to address is the establishment of an emergent concept checklist related to literacy and numeracy skills which may serve as a useful tool for pre-school teachers to screen children and provide them with an individualised explicit instruction to help them develop the missing concepts before they start learning to read and write.

Emergent literacy concepts

An extensive body of research in English has established the developmental sequence of the key pre-literacy and numeracy concepts. The earliest concepts concerning the identification of body parts and gender are related to physiology and emerge early and aid the child establish understanding of the body (Owens Jr. 2008). The next group of concepts concerns the material world (spatial relations, size, colours, shapes and texture); those need to be acquired so children can understand and manipulate objects in the real world as well as learn to read and write and develop numeracy skills (Owens Jr. 2008; Justice et al. 2009). For example, the concepts of "left", "right", "top" and "bottom" are crucial in understanding the left to right orientation of words and sentences when reading and writing (Justice et al. 2009, Justice et al. 2002). The size concepts of "big" and "little" are essential for distinguishing between upper and lowercase letters for reading and writing as well as the concept of number and ordering e.g. "Is 2 *bigger* than 1?", "Line up the teddy bears from *little* to *big*." (Clements et al. 2011; Justice et al. 2009; Justice and Ezell 2004). The next group of concepts are sequencing (e.g. start and end) and comparison/contrast (same/different). Those are vitally important for learning phonological awareness skills such as rhyming e.g., "Children, you need to listen for the sounds that are the *same* at the *end* of the words", and numeracy skills e.g. "Is 5 the same as 6?" (Gillon 2005; Justice et al. 2002). The last set of concepts comprises the meta-linguistic concepts of sound, letter, and

number, which are important for learning an alphabetic system based on sounds and letters, and a numeracy system based on precise representation of the quantity of individual items (Clements et al. 2011; Gillon 2005; Justice et al. 2009; Justice et al. 2002).

Emergent literacy concept screener

Due to the lack of available Polish emergent literacy concept screening tool, an English screening tool (Gillian, Willamson 2009) tested in Australia was translated for use in the present research. The rationale for this translation are that Polish and English are similar in early language acquisition due to physiological factors i.e. both languages need to teach body parts and gender concepts to establish understanding of the body (Brzezińska 1987; Owens Jr. 2008). Both languages are similar in the acquisition of early language due to material world factor i.e. both need to teach colours, shapes, and textures, in both languages children need directional concepts such as left and right, sequencing concepts, meta-linguistic concepts such as sound and letter, and numeracy concepts such as number, as both languages use a left to right alphabetic system and a right to left numeracy system (Brzezińska 1987; Clements i in. 2011; Gillon 2005; Justice i in. 2009; Justice i in. 2002; Owens Jr. 2008; Radwiłowicz, Morawska 1986). Considering that two languages do not have the same linguistic family backgrounds (English is part of the Germanic language family whereas Polish is part of the Slavic language family) some adjustments in the Polish screener needed to be made (Ewert, Czechowa 2011; Gillian 2014).

The basis of the translation was the School Language Readiness Checklist (SLRC) developed by Gillian and Williamson (2009) as part of a project that won an Australian national literacy award at a number of Australian schools. The English basic oral language concepts and their developmental norms were taken from Owens Jr. textbook *Language Development: An Introduction (7th Edition)*. This checklist served teachers as screener to be completed rapidly at the beginning of the school year with an aim to help design intervention programs whose purpose was to aid the emergence of basic language skills in children throughout the school year (Gillian, Williamson 2009). The concepts included in the checklist were grouped in terms of their English developmental sequence (Gillian, Williamson 2009). The Polish translation of the SLRC was finalised by Ferensztajn, Franków-Czerwonko, Gillian, and Paradowska in 2011 (Gillian i in. 2012). This adaptation was designed to be completed quickly in the classroom by teachers and employed as a tool for developing and implementing intervention programs (Gillian i in. 2012).

Research subjects

The Australian research was completed at a school where the five year old students had many difficulties with oral language. Also, most of the students of this school (92%) were noted to speak a language other than English at home and be from lower socio-economic status backgrounds (see Gillian i in. 2012 for more details).

Two stages in the Polish research have been completed: a pilot study and a study with a larger sample size. The pilot study was completed at two state preschools in Gorzow Wielkopolski, Lubuskie Region, Poland in 2011. This study had 27 Polish speaking students who were reported to come from higher socio-economic status (see Gillian i in. 2012 for more details). The larger study was completed in 2012–2013 in the Bogdaniec commune near the city of Gorzow Wielkopolski with 97 children in five preschool groups at four primary schools, 5 and 6 year olds, 53 boys and 43 girls (see Gillian i in. 2015; Gillian i in. 2013 for more details). The children were reported to have Polish as their first language and come from low to average socio-economic status backgrounds (see Gillian i in. 2015; Gillian i in. 2013 for more details).

Before the study at the educational institutions mentioned above, the authors approached a number of other preschools and local government authorities, where they were met with different reactions and, at times, with resentment. To illustrate, when the headmaster and teachers at a preschool in a rural area near Gorzow Wielkopolski were introduced to the idea, they commented on the Australian research results by saying that "maybe the results are true for this wild country down under, but it is impossible that Polish children do not know these basic concepts." A similar opinion was expressed by the mayor of a small town when he was asked to consider a joint application for EU funds to implement the project. Interestingly enough, early education teachers from a nearby school in the same village expressed a great interest in our research; they saw the need to develop the basic language concepts.

Given that a number of educational institutions approached did not see any added value coming from the planned project, the authors appreciated the fact that the two preschool headmasters (in the pilot study) and the head of the Bogdaniec commune (in the main study) not only acknowledged the need for explicit and evidence based teaching of basic oral language concepts for teaching literacy and numeracy, but also saw the project as an opportunity to develop professional skills of the teachers and thereby reduce the risks of the students developing difficulties in these areas.

While the pilot study whose main objective was to check the efficiency of the screening tool was a one-off event, the main study spread over ten months (one school year) and covered introductory meetings with teachers and parents, teacher development in the form of monthly workshops for teachers, and pre- and post-screening sessions.

Collaborative research and teacher development

The study in the Bogdaniec commune began with the researchers meeting parents and teachers of five preschool groups at four villages located in the area. The idea and goals of the developmental program were explained during these meetings to teachers and parents. The authors obtained written consent from the parents so their children could participate in the program.

The participating 12 preschool teachers were provided with the Polish emergent language checklist and trained in its application. During a two-and-a-half hour training session, the rationale behind the screener was explained and the teachers were taught how to

conduct the assessment through a lecture, a video, and group discussions. All the questions were answered and doubts were dispelled. This first training workshop was observed by two school directors whose teachers participated in the project.

The assessment took place in September 2012 and was conducted by the preschool teachers over the period of one week. The gathered data were entered into the spreadsheet (Figure 1 shows data collected from one group of children). The results showed that a large number of students did not fully develop the linguistic concepts regarding the spatial relations, shapes, material textures, the same/different, and sounds occurring at the beginning and end of words. A few children also showed lack of colour perception.

The next stage was to conduct ten teacher development workshops for the preschool teachers during which the selected language concepts were targeted. Each selected concept was thoroughly discussed (both methodology and techniques) and teachers (literacy, numeracy, physical education, foreign languages – English and German, and religion teachers) collaborated in small groups on developing further activities and resources with which a given concept could be presented to children and practised. All the collaborative effort was transformed into lesson plans with brief descriptions of activities designed for all the areas of the curriculum: literacy, numeracy, physical education, foreign languages and religion. After each workshop, all the ideas and suggestions worked out jointly by the teachers were compiled in the form of lesson plans by the research team and were then e-mailed to the participants so that they could choose and implement the activities most suitable for their children's needs (teaching practice stage). At each following workshop the previously devised activities were discussed with reference to their implementation and children's response.

Teacher development workshops and teaching practice were based on the following four principles: teaching what children need (based on evidence from screener), teacher collaboration (planning together), explicit methodologies (task analysis), engaging every child (questioning techniques, peer collaboration, assessment for learning). The justification for the choice of these principles is briefly discussed below.

Years of research into what works in education show that answering to individual *learners' needs* takes priority (Bishop and Adams 1990; Brzezińska 1987; Catts 1993; Catts et al. 2002; Clements et al. 2011; Dickinson et al. 2003; Gillian et al. 2015; Gillian et al. 2013; Gillian et al. 2012; Justice et al. 2009; Justice et al. 2002; Pasnak et al. 2007; Prior et al. 2011; Radwiłowicz and Morawska 1986). Therefore, however complex and elaborate a screening procedure may seem to be, it will always pay off in concrete and visible learning gains, if followed by well-planned learning and assessment processes. That was the case in this project where the teachers participating showed keen interest in their children's initial results, worked hard on developing intervention activities and discussed the implementation process.

The structure and organization of the project required the teachers coming from four different villages to gather once a month in one room and discuss the professional matters concerning the education of children under their care. Such a circumstance naturally lent

itself to close *collaboration*: the collaboration of academic teachers with preschool teachers, of preschool teachers coming from different villages, and of teachers responsible for different curricular elements who taught one group of children. This does not often occur in schools and it was apparent that the majority of the participants appreciated and took the most of the presented opportunity. Some discontent could be felt (from one or two teachers), but it was mitigated by the fact that the more creative teachers gladly shared their ideas with the rest of the group.

As far as *explicit methodologies* are concerned, it was believed that for the children who were about to move on to school and learn to read and write it was too late for lengthy implicit learning of the concepts fundamental for schooling. Also, since *task analysis* is successfully employed to teach children within autistic spectrum, it might as well serve regular children exhibiting some concept deficits.

Engaging every child is a problem for teachers who are responsible for teaching large groups of children. Strategies developed within the framework of formative assessment are helpful, but require the changing of classroom routines for most teachers and therefore such apparently simple tools as group work, peer collaboration or informed questioning techniques are still a novelty in that they are known, but rarely utilized.

The awareness of the workshop participants of the four teaching principles was raised in the teacher development workshops, and mostly put into practice throughout the whole project proceedings. Only some of the proposed methodologies remained beyond control of the research team (e.g. questioning techniques) and so it was up to the teachers to utilize those ideas in their classroom or not.

Research data and analysis

The final stage of the project was to reassess the emergent language skills in order to measure the children's progress at mastering them and evaluate the effectiveness of the teacher development program. To do this, the same screener used at the beginning of school year was applied. At the final meeting with teachers, a recap presentation was delivered to compare the two screenings and discuss the intervention program. It was observed that the children lacked some emergent linguistic concepts at the beginning of school year, and due to the intervention were able to develop most of them.

Figures 1 and 2 below present pre- and post-screener data collected from one preschool group of children participating in the larger study – 12 five-year olds and 10 six-year olds. Due to the fact that the participants had no difficulty with identification of body parts or gender, these concepts are not included in the results presented below. Without gender and body parts, the screener checked children's understanding of 49 basic language concepts: spatial relations (12), size (2), colours (10), shapes (5), textures (4), sequence (2), same/different (7), sounds (5), and letters (2). Figure 1 shows that at the start the most difficult concepts were spatial relations: "nad" (over/above) was problematic for 16 out of 22 students, "góra" (top) and "dół" (bottom) – for 12 students, "po lewej" (left), "po prawej" (right) – for 18 students.

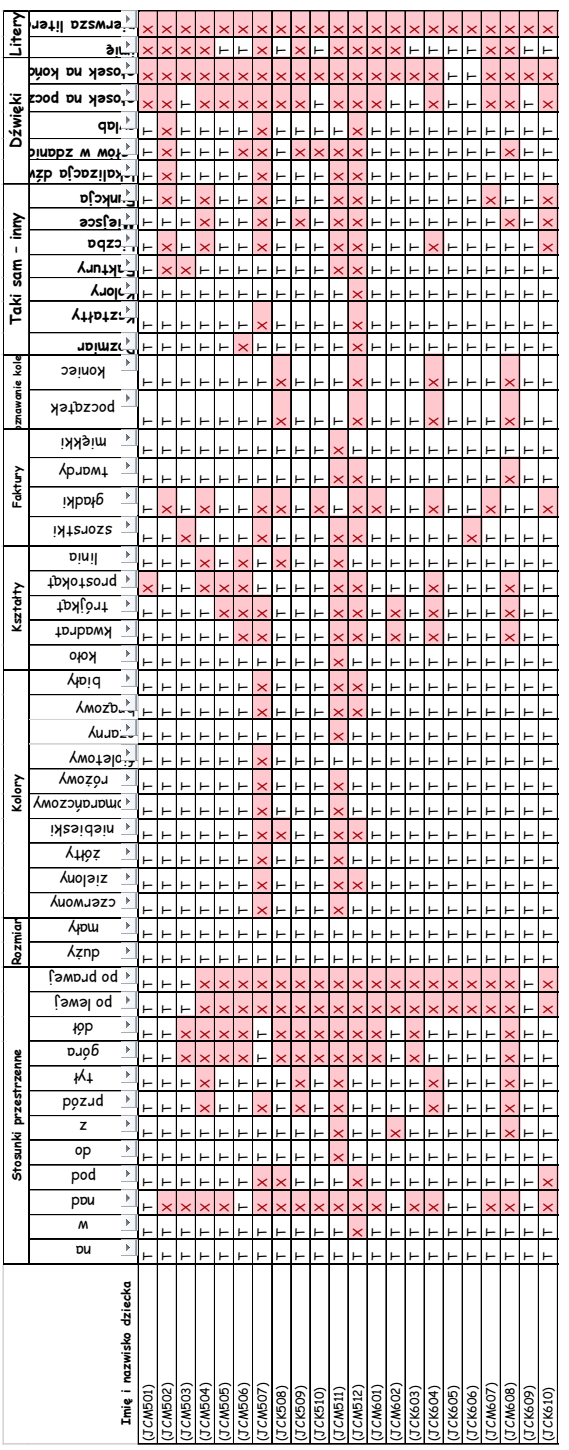

Figure 1. Pre-screener results (September 2012)

Imię i nazwisko dziecka	Stosunki przestrzenne											Rozmiar		Kolory											Kształty				Faktury			Znawanie kole		Taki sam - inny					Dźwięki				Litery
	na	w	nad	pod	do	z	przed	tył	gdzie	dół	po lewej	po prawej	duży	mały	czerwony	zielony	żółty	niebieski	pomarańczowy	różowy	fioletowy	szary	brązowy	białe	koło	kwadrat	trójkąt	prostokąt	linia	szorstki	gładki	twardy	miękki	pocztek	koniec	zmiar	rzatty	olony	iktury	czba	lejsce	inkcja	kalizacja dźw	ów w zadaniu	lab	oseł na pocz	oseł na koń	ałe	erwsza liter
(JCM501)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCM502)	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T
(JCM503)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCM504)	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T
(JCM505)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCM506)	T	T	T	T	T	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCM507)	T	T	T	X	T	T	X	T	T	T	T	T	T	T	T	T	T	T	T	T	X	T	T	T	T	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCK508)	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCK509)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCK510)	T	T	T	T	T	T	T	T	X	T	X	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T
(JCM511)	T	T	X	X	T	T	X	T	T	T	X	T	X	T	T	T	T	T	T	T	T	T	T	T	T	T	X	X	T	T	T	T	T	T	X	X	T	T	X	X	T	T
(JCM512)	T	T	T	X	T	T	T	T	X	T	X	T	X	T	T	X	T	T	T	T	T	T	T	T	T	X	X	T	T	T	T	T	T	T	X	X	T	T	X	X	T	T
(JCM601)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCM602)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCK603)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCK604)	T	T	T	T	T	T	T	T	T	T	X	X	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	X	T	T	T
(JCK605)	T	T	T	T	T	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCK606)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCM607)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCM608)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCK609)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
(JCK610)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	X	T	T	T	T	T	T	T	T	T	T	T

Figure 2. Post-screener results (May 2013)

At the end of the study, the number of children who did not know these concepts dropped to 5 for "nad" (over/above), 4 for "po lewej" (left), "po prawej" (right) and to zero children for "góra" (top) and "dół" (bottom) (see Figure 2).

Sound identification posed a considerable difficulty for most of the participants: 15 out of 22 children failed to identify initial sounds, 20 children did not recognise sounds at the end of the word, and none could identify the first letter in their names. At the end of the study, only 3 children still had problems identifying the initial sound and the first letter in their names. The concept that turned out to be the most difficult and still needed explicit teaching at the end of the study was identification of the end sound of the word. That concept was not identified by 11 out of 22 children at the end of the study (Figure 2).

A comparison of pre- and post-screener results shows that all the participants improved their knowledge of the basic concepts. Eight children (see codes: JCM501, JCM503, JCM602, JCM603, JCM605, JCM606, JCM607, and JCM609) developed all the concepts they had not known at the beginning of the study.

At the end of the study, six children (JCM505, JCM506, JCK508, JCK509, JCM601, JCK610, and JCM608) still did not know one or two concepts. However, one child in this group (JCM608) made a considerable improvement, mastering 18 out of 20 concepts he lacked in September.

There were three children who did not know the majority of the concepts at the start of the study in September 2012. All three of them improved, but this may have been insufficient for later success in learning to read, write and calculate. By May 2013, Child JCM507 learnt 10 out 29 concepts he had missed in September, Child JCM511 learnt 24 out of 36, and Child JCM512 mastered 10 out of 32 concepts. Fortunately, the end-of-year screener provided teachers with knowledge of what the students still needed to learn, so they could provide them with further help.

A manual for preschool teachers

To date, there has been a shortage of textbooks on teaching techniques that are devoted entirely to the development of emergent literacy and numeracy concepts based on quantitative research evidence (Brzezińska 1987; Radwiłowicz, Morawska 1986). As part of the research into emergent literacy and numeracy concepts described in this paper, a resource book for pre-school teachers was developed. This resource book resulted from a collaborative process between the researchers and pre-school teachers in the joint ten-month process of data collection and analysis, teacher-development workshops in which interventions were designed, and teaching practice. This work led to the creation and build-up of a large pool of specific activities, approaches and methodologies, most of which were selected to be included in the resource book.

The manual is composed of three parts. Part 1 provides the preschool teachers with the screening tool and procedure, i.e. the emergent literacy concept checklist, and instructions on how to carry out the screening procedure – the attached CD contains a printable version

of the screener and a data plotting spreadsheet with instructions. The teachers can print the results for on-going reference during planning and teaching so that they know which children need more awareness and practice of a particular concept.

Part 2 of the resource book explains the methodologies and approaches developed during workshops. Here the readers are presented with the rationale behind the chosen methodologies (e.g. task analysis, peer collaboration, or questioning techniques), including examples and tips on what works best under what conditions.

Part 3 of the manual contains a choice of about two hundred activities and tasks to teach and practice those concepts that were found in the research process to require intervention. The activities are grouped into ten chapters covering the following topic areas: top-bottom, on-over-under, front-back, colours, shapes, texture, beginning-end, phonemes, rhymes, and same-different. Each chapter begins with an awareness passage that addresses both the concept itself and an approach to teaching it, followed by an action plan for teaching the concept area by all the pre-school teachers: integrated skills teacher, gym teacher, foreign language teacher, and religion teacher. A number of the activities and tasks require pictures and/or worksheets for children; those are included in the accompanying CD where the teachers can find and make use of 90 photocopiable pages.

Conclusions

Emergent language literacy and numeracy concepts have proved to be of vital importance for the development of literacy and numeracy skills and therefore screening pre-school children for concepts is rational in that it allows teachers to address concrete weaknesses of concrete children prior to literacy and numeracy classroom instruction.

Explicit teaching methodologies help pre-school teachers to develop children's emergent literacy and numeracy concepts thus raising their further educational chances, in particular chances for effective learning to read and write, as well as mathematical skills. This applies especially to children in rural areas with weaker social and educational background whose range of vocabulary may be narrow.

Further research into emergent literacy and numeracy concepts is needed in order to provide pre-school teachers with more informed and evidence-based methodologies helping them to advance their teaching practices and develop new strategies to better address children's educational needs with regard to school readiness.

Emergent Polish language calls for on-going research and promotion. The authors are currently in the process of finding allies to develop a large research project in order to identify Polish children's developmental trajectories for emergent literacy and numeracy concepts.

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