Family-classroom intervention for the development of graphomotor skills

Intervención familia-aula para el desarrollo de habilidades grafomotrices

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Abstract

The complexity of pedagogical actions for initial education teachers is not reduced to directing and giving guidelines from a pedestal; it is part of the class, it requires a lot of tact and preparation. Every time, the effort is greater to innovate and generate stimulating and productive learning processes, however; at the same time, the expectations of parents and society are very high. Situation that calls for transforming pedagogical practices and responding to the social and learning needs of children. The objectives of the study are: a) to describe the beliefs of educators and parents regarding the initiation of early literacy in children of 05 years of age; and b) establish to what extent the family involvement model through the performance of fine motor activities from home, favors the learning of graphomotor skills. The methodology used corresponds to the mixed approach, descriptive-explanatory in scope. The results show not only the impact of the family involvement model, based on the incorporation and exchange of experiences and knowledge between classroom teachers and parents, in the learning of early literacy; Rather, they highlight that taking into account the beliefs of teachers and parents are decisive to transform and change the trajectory of the everyday and usual in the educational culture.

Keywords: Service-learning, cooperative learning, pedagogical beliefs, teaching of writing, family influence, psychomotor skills.

Resumen

La complejidad de las acciones pedagógicas para el profesorado de educación inicial, no se reduce a dirigir y dar pautas desde un pedestal; es parte de la clase, requiere de mucho tacto y preparación. Cada vez, el esfuerzo es mayor para innovar y generar procesos de aprendizaje estimulantes y productivos; sin embargo, paralelamente las expectativas de los padres y la sociedad son muy altas. Situación que convoca a transformar las prácticas pedagógicas y responder a las necesidades sociales y de aprendizaje de los niños. Los objetivos del estudio son: a) Describir las creencias de los educadores y padres de familia respecto a la iniciación de la alfabetización temprana en niños de cinco años de edad; y b) Establecer en qué medida el modelo de involucramiento familiar a través de la realización de actividades de motricidad fina desde los hogares, favorece el aprendizaje de las habilidades grafomotrices. La metodología empleada corresponde al enfoque mixto, de alcance descriptivo-explicativo. Los resultados evidencian no solo el impacto del modelo de involucramiento familiar, sustentado en la incorporación e intercambio de experiencias y conocimientos entre docentes de aula y padres de familia, en el aprendizaje de la alfabetización temprana; más bien resaltan que tomar en cuenta las creencias de los docentes y padres de familia son decisivas para transformar y cambiar la trayectoria de lo cotidiano y usual en la cultura educativa.

Descriptores: Aprendizaje-servicio, aprendizaje cooperativo, creencias pedagógicas, enseñanza de la escritura, influencia familiar, psicomotricidad.

1. Introduction

Graphomotricity is a communicative-evolutionary process that is responsible for the pre-learning of graphic sign communication (Suárez, 2004); and it applies psychomotor skills in children to prepare them in the learning of the writing, and it is a good element for the internalization of partial images of letters (Alfonso et al., 2012; Lurçat, 1988; Segura et al., 2017). Psychomotricity is applied as a step before writing, and it consists of activities such as scribble, first lines, and free drawing on any surface (Ramón, 2016; Reynoso, 2019; Sugrañes et al., 2007), which are used in preschool education with the purpose of successfully initiating early literacy. The acquisition and mastery of the written language is an essential task in the mature development of every child and it is the most significant challenge for any school system (Gómez-Díaz et al., 2015); additionally, it is one of the most difficult and complex learning since it is inked to the management and learning of other skills; for this reason, it requires some necessary conditions to confront it and avoid fear, failure and frustration (Fornaris, 2011).

Pre-school education is the most critical and most important period for the future development of the individual; the experiences and socialization processes lived will be the basis of the skills for further learning, shaping the identity of the students, the self-esteem and allowing them to know the world around them (Balongo & Mérida, 2017; Pastor, 2018; UNESCO, 2014). This involves having a deep understanding of early childhood care and its purposes; knowing each individual; revealing each child's talent to act and create alternatives to respond to their complex needs and problems. Kindergarten in Peru is seen as the level that creates the foundation for the integral formation of children under six years of age, linked in a pedagogical and curricular way with elementary school (MINEDU, 2017); it devotes much of the teaching time to giving meaning to the development of communicative competences in all its ways. One of the main objectives of kindergarten is literacy (Lara & Pulido, 2020) and the acquisition and mastery of the written language (Gutiérrez & Díez, 2015), which has become a prerequisite for school promotion.

Pre-school acquisition of written language representation is a valuable ability to improve early literacy in children (Gerde et al., 2019; Hall et al., 2015); nevertheless, it requires the development of global graphomotor skills (Cisternas et al., 2014), associated with the "first lines", in which the child is not drawing the object itself, but is setting on paper the gestures used by him/her to represent that object" (Montealegre, 2006, p. 26). These graphic representations, as a manifestation of fine motor development, are linked to the "ability to use the hand and fingers in accordance with the requirement of the activity and it refers to the skills that are necessary to manipulate an object" (Serrano & Luque, 2019, p. 16). In this way, handwriting is used to link visual processing with the motor experience, facilitating letter recognition skills (James, 2017). Therefore, the practice of hand-made graphomotricity is more useful with respect to other alternatives (Grabowski, 2010); in this sense, Benítez and Sánchez (2018), conclude that "educating the graphic gesture from the motor movement is a powerful alternative in pre-school education because it facilitates the problem solving of learning the tracing and writing" (p. 195).

Kindergarten, unlike other forms and levels of elementary school, does not teach thematic content, nor does it treat children as students in regular school situations. However, the possibilities of efficient writing learning are often limited in preschool settings (Gerde et al., 2019), since there are still routine pedagogical practices that follow a mechanical, pre-set path, not conducive to enriching the performance and configuration of the scaffolding of linguistic expression and communication, which must be based on metalinguistic knowledge (Arnaíz & Bolarín, 2016), as a capacity to recognize the nature, forms and

functions of written language. Hence, the creation of alternatives to respond to complex needs and problems of preschool children increasingly demand that teachers adapt and innovate in the use of various communication strategies in each interactive episode, varying in a qualitative and quantitative way (Gonzáles, 2015). On the contrary, failure in early literacy of preschool children remains invariably, and when this occurs, the goal of learning writing as a "life tool of every human being is lost and it becomes a learning problem" (Suárez, 2004, p. 6), which limits the learning process of written language and communication in general.

The acquisition of written language by children is seen as a learning that is only relevant to the school system (Ferreiro, 2006); however, in pre-school children are more exposed to interference from their immediate environment and contexts, composed of various factors and with the participation of various educational agents, who must create adequate stimuli in favorable conditions to enhance the development (Gutiérrez et al., 2018). Early literacy learning goes beyond as it is in both formal and informal learning contexts (Parodi, 2010). In this regard, it is proposed to devise children's schools not only intended for children, but focused on families, building complementary relationships based on mutual respect, trust and encounter between family and school (Ferrer & Riera, 2015; Keyser, 2006). Under this model, teachers establish better and more dynamic relationships with the parents to make them cooperate in the realization of specific activities assigned at school, because the parents are the ones who know the characteristics of each child and can greatly influence in the development and well-being of the students, ensuring the quality of pre-school education (Mir et al., 2009; Pastor, 2018).

Thus, the decline of traditional pedagogical practices of early literacy creates the way to more democratic and respectful forms of teaching with the help of educators, the educational community and the family to promote function-al communicative capacities in all their manifestations as the basis for integral development (Díaz, 2019; Palos et al., 2017; Ramos, 2011). In this perspective, the study aims to: a) describe the beliefs of educators and parents regarding the initiation of early literacy in 5-yearl-old children; and b) establish to what extent the model of family involvement through the realization of fine motor activities favors the learning of skills in five-year-old preschool children.

The idea is to create learning proposals based on authentic-participatory actions and experiences in the school and family environment, to respond to the learning needs of children, meet the expectations of the community, and contribute to the transformation of the school, and the cultural and social contexts. The study is part of the perspective of participatory pedagogy and service learning, considered as a pedagogical proposal, program and strategy (Deeley, 2016; Mendia, 2012; Puig et al., 2007), which combines learning processes and service to the community in an active and participative way, providing a formative scenario that enhances the communication skills, social attitudes and the motivation required for the concretion of the tasks and competences envisaged (Chiva- Bartoll et al., 2018; Gil et al., 2016; Huda et al., 2018).

2. Methodology

2.1. Temporary-spatial location

The study was conducted during the second semester of the 2019 school year, at the Initial Educational Institution (IEI) San Martín de Porres, Puno City. It corresponds to the district, province and department of Puno-Peru.

2.2. Samples

It consists on the section of students and their parents of IEI San Martín, composed by a) 18 children (eight men and ten women); b) 18 parents (15 women and three men); and c) three

teachers, all women (teachers of the three-year-old and four-year-old sections only participated during in-depth interviews). Two criteria were first used for the selection of the sample: The willingness and cooperation of the classroom teacher, allowing one of the research team to take the control of the experimental sessions in the classroom; and, the consent and actual involvement of parents in the pedagogical proposal. It should also be noted that the parents of this section were the best organized and most prominent group in the educational institution.

2.3. Focus and scope

It is a case study with a mixed approach: qualitative-quantitative and descriptive-explanatory, carried out through 12 learning sessions in the classroom and in children's homes on a two-hour weekly basis in a row during the second semester of the 2019 school year.

To describe the beliefs of teachers and parents regarding the initiation of early literacy in preschool children, the in-depth interview technique prior to experimental treatment was used, considering as categories of analysis: a) perceptions of school-family linkage (a combination of communication interactions, experiences and knowledge between parents and teachers to concretize school assignments and learning competences envisaged for children); b) beliefs on early literacy and learning of graphomotor skills during the quasi-experimental single-group with pre and post-test were determined according to the results obtained by the observation technique and the evaluation-assessment sheet.

The evaluation-assessment sheet, as a research tool used to measure the level of learning in graphomotricity, basically presented the following structure:

GRAPHO-MOTRICITY (dimensions)	SKILL EXECUTION	EVALUATION CRITERIA	VALUATION SCALE
Manipulative-experience	Tense and relaxed syncretic lines	The student draws lines with angles and waves continuously using colored crayons.	According to the assessment level of learning levels established by the Ministry of Education of Peru: initiation C (00-10 points), process B (11-15 points) and achieved A (16-20 points).
Symbolic interiorization	Tight and loosened linear drawings	The child represents or replaces actual objects in internal objects by joining lines according to an image, and draws lines of the same size and direction, joins two points across a line, draws an object giving meanings.	
Perceptual representation	Iconographic drawings and opacity	Representation of open-closed figures, pre-schematic graphic shapes and free drawing, distinguishing the shape and background.	

2.4. Procedures for the implementation of the intervention model

- Formal authorization and consent of the institution management, teacher and parents to conduct the educational research proposal.
- Inclusion and approval of the proposal under participatory and consensus mecha-

nisms during shared working meetings between the teacher and parents. The research team has selected a representative to propose and agree on the purposes, procedures and actions of the joint work to be implemented in the classroom and at home.
- The implementation of the 12-classroom learning activities under the intervention model was carried out by a member of

the research team. The teacher and other researchers observed the class to balance the progress of the proposal and to make adjustments if required.

· The activities or tasks developed by children at home were executed following a simple procedure plan that was previously agreed and approved during the section meetings, according to the dimensions of the dependent variable and the expected learning achievements with respect to graphomotor skills. These activities were linked to the methodological sequence developed in the classroom called extension of the learning session, under the direction of the parents or relatives. In view of the expectation generated and the permanent request from the parents, the members of the research team attended to the implementation of activities at home to advise and monitor the intervention.

· The research team underwent a weekly evaluation of the progress of the experiment in all its components. Any proposed restatement involved consensus among all participants, particularly with the teacher.

· The in-depth interview was conducted before and after the meetings of parents and teachers, as well as at the times of entry, waiting spaces and exit of children from the educational institution, as a priority.

2.5. Variables/categories of analysis

The independent variable was represented by the family-classroom intervention model, typified as a learning-service strategy from which 12 learning sessions were designed and executed, focusing on the concretion of fine psychomotor activities, considering the visuomotor dimensions, manual and visual-manual. The graphomotricity, as a dependent variable, considered: Manipulative-experiential (tense and distended syncretic lines); symbolic interiorization (tight and loosened lines); and perceptual representation (iconographic lines and performance of opacities), which were measured by the learning scale established by the Ministry of Education of Peru: initiation C (00-10), process B (11-15) and achieved A (16-20).

Moreover, the beliefs described by parents and the pre-school education teacher of five-year-old children correspond to the category of analysis addressed from a qualitative perspective. For this purpose, the data collected were coded as follows: D=teacher and F=parent, adding a number in parentheses to differentiate each member of the population. Example: D(1) identifies the first teacher. For parents, the numbering reaches up to 18.

2.6. Data analysis

Quantitative data were analyzed using SPSS software, the calculated t and the specific p-value were determined in relation to the corresponding level of significance, as presented in the results section. For qualitative data, content analysis was used and the interpretation procedure basically consisted on considering the phrase as a unit of analysis to ensure the reliability of understanding and interpreting concepts or meanings. The statistical hypothesis proposed was:

$$H o: \mu_2 = \mu_1$$
$$H a: \mu_2 > \mu_1$$

3. Results

The study provides results of pedagogical and social value through qualitative data and reflections (beliefs about pre-school education) and quantitative data (learning of graphomotor skills through the family-school pedagogical intervention model), which are closely related with each other. As presented in the literature, beliefs or subjectivities constitute a space for the construction of meanings and senses that direct the actions and modes of being of individuals (Izaguirre & Alba, 2016); the beliefs or subjec-

tivities created by teachers guide their work, influence and modify their pedagogical practices, thus, are essential in the making of curricular decisions and the concretion of learning objectives, since they integrate new learning into practical situations. Finally, subjectivities guide the actions and decision-making of teachers (Cuadra et al., 2015; Gómez et al., 2014; Hernández-Álvarez, 2010).

3.1. Parent and teacher beliefs on pre-school education in five-year-old students

Pre-school teachers consider family-school involvement as a matter of co-responsibility to guarantee and contribute to an adequate comprehensive training and quality education; however, according to their pedagogical beliefs, initiating five-year-old children in writing skills is not common, but they are open to new teaching-learning situations and proposals.

> Both parents and us, teachers, are obliged to integrate, be closer to our children, and we are both responsible for their education. (D-1)

> The education of children is not the sole responsibility of the teacher but of the parents. (D-3)

> We have already made it clear in this institution and in all pedagogical meetings that initial education is not devoted to the teaching of literacy, let see what happens with the proposal, I am concerned, it seems different. (D-2)

Likewise, parents acknowledge that it is necessary to maintain constant communication with the teacher and the educational institution to have a better understanding of the progress and learning difficulties of children; and they expect to see their children acquire the basic skills in literacy at the end of initial education at the age of five.

> We must always be in communication. We are interested in the education of our children and

that they learn more, and they will learn better if the teacher makes an effort to teach them to read and write. (F-8)

> I agree with communication, otherwise how we would know the content learnt by our children, now it would be a great thing for our children to start and end the level knowing how to write something. (F-13)

> Parents are committed to our children; we will always be identified with the institution and willing to participate in everything. (F-1)

> The level consists in more games and little learning, I would appreciate if children ended up writing. (F-18)

> Yes, communication with the teacher is essential, otherwise we would not be aware of what is happening in the institution, it is very important. (F-5)

Some perceptions of parents point the educational institution as an independent organization and arbitrary to their interests, and think that teachers have the role of educating children; however, they are collaborative with the parent organization and the teacher.

> The institution never consults with parents, we are only dedicated to fulfilling what they command, but there we are, we take on any matter, we do not refuse anything. (F-4)

> If it is about teaching, it is definitely a role for teachers, we could perhaps support with something. (F-6)

The pedagogical beliefs of the educators regarding the teacher-parent bond of the family favor the sense of greater openness and permeability between both parties, sustained in respectful and reciprocal relations. They also emphasize that parents must be part of the feedback at home, a situation that involves cooperative work between parents and teachers in favor of children's learning.

They must understand that we as professors and parents, we model children, we have to be flexible and respect each other. (D-1)

Parents must reinforce what we do in the classroom, because children do not see us exactly as teachers. (D-2)

3.2. Model of involvement for the development of graphomotricity

The interactive family-classroom pedagogical intervention model designed in the method-

ological perspective of the learning-service strategy, focused on the execution of fine psychomotor activities—and through quasi-experimental analysis it has allowed to increase learning levels in manipulative-experiential graphomotor skills, symbolic internalization and perceptual representation of five-year-old children. According to these results, the alternative hypothesis is accepted and the null hypothesis is rejected, as evidenced in the following table accompanied by the p-value and the corresponding decision rule.

Table 1. Results of the independent sample graphomotricity levels in five-year-old children

| | | Levene´s test of variance quality | | T TEST FOR MEAN EQUALITY | | | | | 95% confidence interval of the difference | | |
	F	Sig.	t	gl	Sig. (bila-teral)	Mean differences	Standard error differen	Inferior	Superior	
NOTES	Equal variances are assumed	3.568	.067	10.639	34	.000	-8.944	.841	-10.653	-7.236	
	No equal variances are assumed			10.639	32.161	.000	-8.944	.841	-10.657	-7.232	

Source: own elaboration according to the primitive data analyzed using SPSS

Determination of the p-Value

$$P \text{ Value} = \frac{Sig}{2}$$

Decision rule

Since P Value$<\alpha$ then Ho is rejected and Ha is accepted
Since $0< 0.05$ then Ho is rejected and Ha is accepted

The results of the study are consistent with other similar research work that confirmed the effectiveness of psychomotor and visuomotor intervention programs in the development of graphomotricity (Gonzáles, 2015; Layes et al., 2019); however, it is difficult to grant them a hundred percent of accuracy, since they require more scientific investigation. The design of quasi-experimental research without a control group is a limitation of internal validity that prevents

observing to which extent the independent variable is responsible for the changes observed in the learning of graphomotor skills.

However, there is no doubt of the benefits of the family-classroom pedagogical intervention model as a learning-service strategy even though they were not part of the purposes of the study (Mendia, 2016; Tapia, 2010): children work interactively with their parents and teachers to maximize their own learning; situations are generated in which particular forms of interaction are expected to occur in order to foster the learning process (Collazos & Mendoza, 2009); it involves teachers to restate the usual pedagogical processes to establish closer, dialogical and affective relationships with children, parents and the community in general to realize the aspirations related to the quality of learning and education; to renew the conventional roles of teachers through collaborative-interactive and consensual transactions aimed at achieving established goals (Revelo-Sánchez et al., 2018).

4. Discussion and conclusions

The family and the school constitute the most privileged spaces to build and create the integral development of children, and both parties must work together to satisfy and enhance with quality and relevance the learning capacities and talents of children; thus, it is necessary to have permanent and timely cooperation between the family and school. However, in our context, strategies to foster family-school-community linkages are still fragile, limited and traditional, leading to the development and redefinition of the role of education in general (Bermejo et al., 2020; Razeto, 2018); so that school is not a hope of well-being, but the place of permanent enjoyment (Bermejo & Maquera, 2019). The tendency to assess early literacy processes and the learning of writing in general as school-only practice (Vance et al., 2007), persists on a regular basis.

According to the results obtained, the school-home family involvement model is a feasible and acceptable learning-teaching strategy (Goldman et al., 2019), to accompany and follow the learning processes of graphomotor skills in five-year-old children, and it recognizes the active collaboration of parents in supporting children with the execution of specific activities assigned by teachers (Pastor, 2018). It is constituted in a privileged space of the participation and learning, and it is an essential methodology in the family formative process (Mendoza & Zúñiga, 2017); therefore, it has a pedagogical and social value.

Its implementation depends previously on the positive attitudes and beliefs of parents and teachers. Understanding the beliefs of teachers and parents regarding how to contribute to the construction of learning in children is crucial, as they support actual learning (Gerde et al., 2019); they act as filters of acquired knowledge that allow people to understand the world and develop in it in a certain way (Díaz, 2013); otherwise, as Patiño and Rojas (2009) mention that the learning that denies subjectivity is not pedagogy, because it would deny the subject as a builder of significant cultural, social and individual representations.

Family-classroom linkage strategies, supported by the execution of fine psychomotor activities according to the learning results obtained by most children included in the experimental analysis allow the increment or development of graphomotricity skills. Children can maximize their own learning by interacting through collaborative activities with their parents and teachers. Parents actively participate and assume co-responsibility in the educational processes of children at school, and teachers take on new roles and establish more dialogical and affective relationships with children and their parents, motivating them to achieve educational goals. In fact, different studies confirm that the development of graphomotor skills in children are based on the acquisition of fine motor skills (Gonzáles, 2015), which has a close relationship between fine motor and writing (Lica et al.,

2010); proposing the fine and coarse exercise for the learning of graphism (Segura et al., 2017), that will be useful to increase the identification and recognition of letters (Gil et al., 2012; Zemloc et al., 2018). However, it must be taken into account the limitations of scientific and methodological rigor of the study.

The experienced model was stimulating and challenging for learning graphomotor skills by establishing better relationships of trust and communication between the school reality and the everyday life of children. It accomplishes the child to perform proper and correct graphical execution actions on his or her own in the space to be represented, maintaining proper postural control, arm mastery, and how to hold the pen. Moreover, the procedure involved helps to materialize ideas that suggest activity and responsibility in children to shape their lifestyle (Ortiz, 2012). The child, developing the sense of movement and representation in an autonomous and reflective way, is not exposed to the classic phrase of what can and cannot be and leaves behind the imitation as a favorite procedure in pre-school education, but instead has his/her own initiative and social stimulus to develop own and diversified competences that will identify him/her as a unique and distinct person.

The importance of these findings lies not only in the design of challenging and stimulating learning contexts for children and in the fact of having generated opportunities and spaces between teachers and parents to participate, exchange and share experiences and knowledge during the accompaniment in children's educational processes, but in the verification of the existence of a human potential (Guerrero, 2000), capable of changing the trajectory of the daily basis. On the other hand, it is evident that the beliefs, knowledge, experiences and ability to adapt to unexpected changes of parents and professors regarding the formation of the child are the greatest strength, the best contribution and effort to change the educational culture. It is possible to create alternative realities of pedagogical practice by designing and participating in learning contexts shared between the school and the daily life of children. What parents and society expect from teachers and school can be found in themselves by experimenting, enriching and producing new styles and values of being parents and contributing to the human formation, transcending spaces and boundaries.

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