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Article

Application of a pedagogical kit to improve fine motor skills and learning in children from 1 to 3 years of age of the students of the IIS-2022 degree process

Aplicación de Kit pedagógico para mejorar la motricidad fina y aprendizaje en niños de 1 a 3 años de los estudiantes del proceso de titulación IIS-2022

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Abstract

This degree project in Complexivo mode is based on a technical report by the student Castillo Amalia Lorena from the Integral Child Development course at the Instituto Superior Tecnológico Simón Bolívar, in Guayaquil, semester IS-2022. The topic addressed was "Pedagogical kit to improve fine motor skills and learning in children aged 1-3 years at CDI Divino Niño, Balzar", with a focus on improving fine motor skills and learning, given that difficulties were observed in these areas and a lack of documentation of appropriate activities (Castillo, 2022)The general objective of the study was to apply a pedagogical kit to improve fine motor skills and learning in children aged 1-3 years through a field study. The specific objectives included identifying the level of motor development through assessment instruments, selecting appropriate play activities through a literature review and presenting the results through data analysis. Qualitative methods were used - descriptive, bibliographic and field

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methods. The qualitative research focused on in-depth analysis of meanings and contexts, while the bibliographical research collected data from various sources. Field research compiled data in uncontrolled environments to describe specific phenomena. The results showed that, after application, there was a significant improvement in children's motor skills, such as gluing, scribbling, cutting, moulding and curling. In the pre-test, many children were in the process or did not achieve the skills, but in the post-test, the majority mastered the skills.

Key words: pedagogical kit, test, fine motor development, Montessori methodology, pedagogical theories.

Resumen

Este trabajo de titulación de modalidad Complexivo se basa en una memoria técnica realizada por la estudiante Castillo Amalia Lorena de la carrera Desarrollo Infantil Integral del Instituto Superior Tecnológico Simón Bolívar, en Guayaquil, semestre IS-2022. El tema abordado fue “Kit pedagógico para mejorar la motricidad fina y aprendizaje en niños de 1 3 años del CDI Divino Niño, Balzar”, con un enfoque en la mejora de la motricidad fina y el aprendizaje, dado que se observaron dificultades en estas áreas y una falta de documentación de actividades adecuadas (Castillo, 2022)El objetivo general del estudio fue aplicar un kit pedagógico para mejorar la motricidad fina y el aprendizaje en niños de 1 a 3 años mediante un estudio de campo. Los objetivos específicos incluyeron identificar el nivel de desarrollo motor mediante instrumentos de evaluación, seleccionar actividades lúdicas apropiadas a través de un estudio bibliográfico y presentar los resultados mediante un análisis de la información. Se utilizaron métodos cualitativos –descriptivos, bibliográficos y de campo. La investigación cualitativa se centró en el análisis profundo de significados y contextos, mientras que la investigación bibliográfica recopiló datos de diversas fuentes. La investigación de campo compilo datos en ambientes no controlados para describir fenómenos específicos. Los resultados mostraron que, tras aplicación, hubo una mejora significativa en las destrezas motoras de los niños, como pegar, garabatear, trozar, moldear y enroscar. En el pre –test, muchos niños estaban en proceso o no lograban las destrezas, pero en el post –test, la mayoría dominó las habilidades.

Palabras claves: kit pedagógico, test, desarrollo motor fino, metodología Montessori, teorías pedagógicas

Introduction

Fine motor development and learning in early childhood are crucial aspects that significantly influence children's overall growth. In this context, the overall aim of this study is to implement a pedagogical kit designed to improve fine motor skills and learning in children aged 1-3 years using field studies. This approach allows for an in-depth and contextualised understanding of the impact of these interventions on young children.

The specific objective of this research includes identifying the level of motor development of 1-3 year olds through assessment instruments, selecting activities based on literature studies and presenting the results obtained by analysing the information collected. To this end, various research methodologies were employed, combining qualitative, descriptive, bibliographical and field approaches. This multifaceted approach allows the problem to be approached from different perspectives, ensuring a comprehensive and detailed understanding of the observed phenomena.

Research methodology is defined as "a fundamental tool in the field of research that, by its structure and content, addresses the basic elements that guide a project in a methodological and didactic way" (Universidad Naval de Mexico, 2023).in this study, several research methods were applied to ensure accurate data collection and comprehensive analysis. Qualitative research focuses on "the in-depth description of phenomena, allowing a reflexive analysis of the following subjective and intersubjective associated with the realities studied" (Mata Solis, 2019). Therefore, "documentary research allows the creation of a theoretical framework, collects and analyses data from various sources to provide new knowledge on the subject under investigation and discover new lines of research" (Rus Arias, 2023).

Field research, defined as "the collection of information in real controlled environments" (Cajal, 2023) was essential for this study, allowing the manipulation of external variables and the collection of data directly from the environment where children develop. This methodology provided an authentic view of how children interact

with the pedagogical kit in their natural environment, facilitating the observation of genuine behaviours and progress.

Pedagogical, psychological and sociological theories informed the selection and application of the pedagogical kit. For example, Montessori theory "elaborated a specific didactic material that constitutes the fundamental axis for the development and implementation of her method" in education (Salanova Sanchez, 2023), while Piaget underlines the fundamental role of "activities through acquired level of importance as the effective method in learning" (Chuva Castillo, 2016). These theories provide a solid theoretical framework that guides the implementation of the kit, ensuring that the proposed activities are not only playful, but also educational and age-appropriate for the children.

The implementation of the pedagogical kit included activities designed to improve hand-eye coordination, precision of movements and manipulation of small objects. These activities, selected on the basis of literature studies, were adapted to be attractive and challenging for children aged 1-3 years, thus promoting active and participatory learning. The assessment instruments used allowed objective measurement of the children's progress in fine motor skills, providing valuable quantitative and qualitative data for analysis.

Analysis of the information collected was carried out using statistical and qualitative techniques, allowing for a detailed interpretation of the results. We sought to identify patterns and trends in fine motor development, as well as to evaluate the effectiveness of the pedagogical kit. The results obtained provided an empirical basis for assessing the effectiveness of these interventions and their impact on child development, highlighting areas for improvement and successful aspects of implementation.

The importance of this study lies in its contribution to knowledge about early child development and the effectiveness of pedagogical interventions. The integration of diverse methodological approaches and sound educational theories ensures that the findings are relevant and applicable in various educational contexts.

In summary, the study aims to improve fine motor skills and learning in 1-3 year olds through the application of a pedagogical kit, supported by a sound research methodology and grounded in pedagogical, psychological and sociological theories. The results obtained will provide an empirical basis for evaluating the effectiveness of these interventions and their impact on child development. By better understanding how play activities can

influence motor and cognitive development, more effective and personalised educational programmes can be designed for children at this critical stage of their lives.

Materials and methods

For this study, qualitative, descriptive, documentary and field research was considered. According to Guevara, (2020) descriptive research aims to describe the fundamental characteristics of homogeneous sets of phenomena. To do so, it uses systematic criteria that allow the structure or behaviour of the phenomena under study to be established, providing information that is systematic and comparable with that from other sources. For his part, Mata, (2019) mentions that the qualitative approach assumes a subjective, dynamic reality composed of a multiplicity of contexts that prioritises the deep and reflexive analysis of the subjective and intersubjective meanings that are part of the realities studied.

As for documentary research, Rus (2023) indicates that it consists of collecting data from different media such as newspapers, bibliographies, videos, audios and any other type of document with the aim of analysing them in order to provide new knowledge on the topic to be investigated. Also field research deals with the collection of data in real, uncontrolled environments outside the workplace (Cajal, 2023).

For the application of the assessment, a checklist was used as an instrument. This instrument is one of the most prominent in observation and data collection, due to its ability to structure the assessment with established criteria. The checklist is ideal for evaluating a variety of aspects such as tasks, actions, processes, learning products, or behaviours (Universidad Autonoma del Estado de Hidalgo, 2019). In this case, the checklist was designed using specific indicators. These indicators allow for a detailed assessment of the skills of the infants to whom the Pedagogical Kit was applied to improve fine motor skills and learning in children aged 1 to 3 years, the indicators help to identify and measure precisely how children's skills are developed in different areas. This methodology not only facilitates a comprehensive and systematic assessment of infants' abilities, but also provides valuable information to adapt and improve the pedagogical strategies used in their teaching and development.

For the population of this study, children from 1 to 3 years of age from 16 different child care centres belonging to the MIES were considered for the application of the Pedagogical Kit to improve fine motor skills with a sample of 160 infants with a reliability of 90% and a margin of error of 10%.

Results

The results of the application of the pre-test checklist applied to 160 infants between 1 and 3 years of age show that 14 children had difficulty in cutting and did not achieve it, 108 were in the process of scribbling and only 67 could master the skill of screwing and unscrewing, while in the activities of moulding and kneading - sticking and peeling the difficulty was lower. Due to these values, we proceeded to the application and orientation of the activities: gluing and peeling, doodling, cutting, moulding and kneading, screwing and unscrewing of the pedagogical kit to improve fine motor skills and learning in infants, then we applied the post-test checklist, The post-test checklist was then applied, showing that the infants can improve the development of their fine motor skills such as free scribbling, paper cutting, moulding and kneading, twisting and unscrewing, gluing and peeling, which allows them to make small and very precise movements.

Dexterity: Performing different wrist, hand and finger movements that allow them to pick up objects using the tripod gripper.

In the application of the pre-test checklist to 160 infants who were evaluated, 8% were unable to achieve the sticking and peeling skill, 51% were in the process and only 41% were able to achieve the skill. After the activities of the pedagogical kit were oriented, the post-test was re-applied and 127 children mastered the skill with 79%, as shown in table 1: exercises for the mastery of the tripod gripper.

Table 1. *Exercises for tripod gripper mastery*

ACTIVITY	NC	EP	DL	Total general	%NC	%EP	%DL
Glue and peel off							
Pre-test	12	82	66	160	8%	51%	41%
Post-test	0	33	127	160	0%	21%	79%

Skill: To explore different possibilities of producing more elaborate works using materials and grapho-plastic techniques, stimulating their imagination and creativity.

In the application of the pre-test scorecard, out of 160 children who were evaluated, 9% did not achieve the doodling skill, 66% were in the process and 26% achieved the skill. After the activities of the pedagogical kit were oriented, the post-test was applied again and a notable improvement was evidenced, with 61% of infants having mastered the skill.

Table 2. *Creative exploration*

ACTIVIDAD	NC	EP	DL	Total general	%NC	%EP	%DL
Trozado							
Pre-prueba	14	105	41	160	9%	66%	26%
Post-test	1	61	99	160	1%	38%	61%

Skill: Performing hand and finger movement coordination actions such as: stringing beads with smaller holes, twisting and unscrewing, turning knobs and stacking a greater number of objects, among others.

In the application of the pre-test checklist, 58% of the 160 infants who were evaluated were in the process of performing the skill and only 42% were able to twist and unscrew. After the pedagogical kit activities were oriented, the post-test was re-applied and 73% of the children mastered the skill, as shown in table 3: motor coordination.

Table 3. *Motor coordination*

ACTIVITY	NC	EP	DL	Total general	%NC	%EP	%DL
Screw and unscrew							
Pre-test	0	93	67	160	0%	58%	42%
Post-test	0	44	116	160	0%	28%	73%

Table 4: summary of the skills shows the results of the application of the pedagogical kit and the tests (pre and post) to the 160 children between 1 and 3 years old in the different MIES child care centres, showing that in the pre-test 58% of the children were in the process and only 36% managed to master the skill, after the application of the pedagogical kit and in the post-test 29% of the children were in the process of acquiring the skill and 71% of them had mastered it, improving the development of fine motor skills.

Table 4. *Summary of developed skills*

FASE	NC	EP	DL	Total general	%NC	%EP	%DL
Antes de la prueba	9	93	58	160	5%	58%	36%
Post-test	0	33	127	160	0%	29%	71%

Discussion

This study investigated the effectiveness of the application of the Pedagogical Kit to improve fine motor skills in children from 1 to 3 years of age in 16 different MIES child care centres in the city of Guayaquil. The results indicated that both the materials and the proposed activities were positive, as 71% of the children included in

the study were able to master the different skills established in the early education curriculum.

These results underline the importance of providing adequate resources and well-designed activities for the early development of fine motor skills. The pedagogical kit, which includes a variety of tools and specific exercises, allowed the children to practice and improve their hand and finger coordination skills in a systematic way. In addition, it was observed that the children not only showed improvements in specific skills such as stringing beads, twisting and unscrewing objects, and gluing or peeling, but also demonstrated an overall increase in their confidence and autonomy when performing tasks that require precision and motor control.

The findings are consistent with previous studies that have shown the importance of working with a variety of materials to improve fine motor skills, according to Calero (2024) they contribute positively to fine motor development, which will provide crucial support for children when learning to write, if they have received adequate stimulation through specific activities, this task will not be complicated. Ortiz (2021) mentions that didactic resources act as facilitators of the development and enrichment of the teaching-learning process, playing a crucial role in evaluating their effectiveness from various perspectives, including formative, individual, preventive, corrective and compensatory. Taken together, these findings underline the importance of employing a wide range of didactic resources to enrich the development of fine motor skills and optimise the teaching-learning process in the educational setting.

Therefore, these results have important implications for the development of pre-school children's skills in compliance with the current early education curriculum, which not only improves fine motor skills but also fosters a natural environment of creativity and self-expression, helping to raise children's self-esteem and independence.

Limitations include the short implementation period of the pedagogical kit, which may have restricted the ability to observe long-term changes or more profound effects on the participants. For future research it can be observed whether the proposed materials and activities have a significant impact over a longer period of time.

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