

## **THE GENDER AND THE TEACHING STYLE INFLUENCE OVER THE MATHEMATICS AND COMMUNICATION RESULTS IN PRE-SCHOOL EDUCATION**

Simona Cristina Albu<sup>1</sup>, Eliza Mihaela Spătărelu<sup>2</sup>

### **Abstract**

The teaching style represents the manner in which the teacher presents the information to the children after they have received their own imprint. Mathematical Activity (MA) and Communication Activity (CA) are the basis of future mathematical and communicative knowledge in preschool education. For this reason, MA and CA are given an essential place in the program carried out in kindergarten. The literature revealed a lot of factors that interact with results in preschool education, but there is a lack of studies that include both variables, teachers' teaching style, and children's gender, in the equation. The purpose of this study was to investigate how children's gender and teachers' teaching styles are influencing preschoolers' results in MA and CA. The research followed a quantitative design and was carried out in the 2021-2022 school year in several kindergartens belonging to the Adventist Church in Romania. The sample comprised 111 preschoolers between 5-6 years old, organized into 9 groups and their teachers. The applied tools were represented by the Teaching for Successful Intelligence Questionnaire (Paloş & Maricuţoiu, 2013) for the variable teaching style and the questionnaire with questions for educators for the variable gender of children. The instruments used for the dependent variables, the partial results at MA and CA, were called the Competition Sheet. After applying the tools, the data was analyzed

---

<sup>1</sup>Simona Cristina Albu, PhD in Education Student, Montemorelos University, Mexico, [cristina.albu@uadventus.ro](mailto:cristina.albu@uadventus.ro); <sup>2</sup>Eliza Mihaela Spătărelu, PhD, Adventus University of Cernica, Romania, [eliza.spatarelu@uadventus.ro](mailto:eliza.spatarelu@uadventus.ro).

using the T-test for independent samples and One-Way ANOVA. The results obtained after the data analysis mention that, according to gender, there are no significant differences between the results obtained by girls and boys at MA and CA. The research conclusion mentions that all four of the teachers' teaching styles—the creative, the reproductive, the analytical, and the practical styles—influenced the preschoolers' results in MA but did not influence their results in CA.

### **Keywords**

Teaching style, gender, preschoolers, communication activity, mathematical activity

## **INTRODUCTION**

The way teachers impart knowledge to students is known as teaching style. Each teacher has their preferred teaching style, influenced by their educational philosophy. Teaching style can impact an institution's development. There are four teaching styles: traditional, analytical, creative, and practical. Analytical teachers provide feedback and communicate more with their students. Creative teachers are student-centered and use new strategies. Practical teachers transfer theoretical knowledge into practical situations. Traditional teachers lead student activity and use memorization and playback.

Preschool education includes Mathematics (MA) and Language and Communication (CA) domains. MA provides basic mathematical knowledge and skills using numbers, relationships, geometry, and measurements, which are taught using literature and games. CA aims to develop communication, language, vocabulary, grammar, and syntax using oral communication, reading, and writing. Traditional teaching methods include storytelling, lectures, and conversation. Reading expands language and teaches early literacy. This study aims to investigate how teaching styles and gender affect preschoolers' performance in mathematical and cognitive abilities. The research objectives are to identify differences in academic performance based on gender and teaching styles.

## REVIEW OF LITERATURE

The teaching style represents the way in which the teachers transmit the knowledge to the students (Achmad et al., 2023; Husin et al., 2023; Saritaş, 2016). Teachers have their own teaching style (Achmad et al., 2023) or prefer a certain teaching style (Fleming & Bonwell, 2019; Paloş & Maricuţoiu, 2013) and have their own educational philosophy that positively correlates with the style of teaching (Saritaş, 2016). Teaching style can influence the institution's development (Yang et al., 2017).

The teaching style (Ridwan et al., 2019) determines a certain learning style for the students, which uses the four ways of receiving and reproducing information: visual, auditory, read/write, and kinesthetic (Fleming & Bonwell, 2019). Teachers can fit into a major teaching style or approach transmitting knowledge through several styles combined (Husin et al., 2023) and different (Puiggali, 2021). Because students are different, it is necessary that the teaching approach aims for more styles (Husin et al., 2023) in order to meet their needs (Achmad et al., 2023; Husin et al., 2023).

Several authors identify four teaching styles of teachers: the traditional (reproductive) style, the analytical style, the creative style, and the practical style (Arabsheybani & Akhondi, 2018; Paloş & Maricuţoiu, 2013). The analytical teaching style includes analysis, issuing opinions, comparing, and evaluating notions (Paloş & Maricuţoiu, 2013). The results of the research show that the actions of analytical teachers have a significantly higher correlation with feedback and communication of student results (Lozano-Rodríguez et al., 2020). The creative teaching style is based on the teachers' creativity, who determine the students' creativity through the use of new strategies and the ability to apply them (Haertel et al., 2016). Among them are using new words and expressions and role-playing games (Paloş & Maricuţoiu, 2013). In this case, the

teaching of creative teachers is student-centered (Bramwell et al., 2011). The practical teaching style aims to transfer theoretical knowledge into practical situations in real conditions, and the teachers use clear concepts and requirements, concise ideas, and creativity in application (Paloş & Maricuţoiu, 2013). The research conducted by Lozano-Rodríguez et al. (2020) shows that teaching teachers with a practical style is influenced by the class's level and the subject presented. The traditional (reproductive) teaching style is based on knowledge accumulation, memorization, and playback (Paloş & Maricuţoiu, 2013). The teacher is at the center of the teaching, leading the children's activity. It presents some advantages, such as the fact that all children receive information at the same time, the limited time, and the use of closed questions that do not ask children for interventions (Menegato, 2008).

### **Mathematics and Language and Communication in preschool education**

In kindergarten, specific learning activities are organized by experiential domains, MA and CA. In the Romanian educational context, the two activities are considered essential for future knowledge at the school level. In this sense, the upper kindergarten group was given a running time of two occasions per week. The content of the experiential activities is taught and evaluated according to internal plans, which follow the guidelines of the official document for preschool education, the Curriculum for Early Education, 2019. In kindergarten, the knowledge assessment is carried out at different moments of the educational process during a school year. These represent the initial, formative, and summative assessment stages (Manolescu, 2019, p. 569).

MA is a component of the science domain and provides preschoolers with elementary knowledge and skills in mathematics (MEN, 2019, p.24). At preschool age, through MA, the

transition from the concrete-intuitive way to the abstract way is realized, following the progress of children's logical thinking (Antonovici, 2016; Dumitrana, 2002). The mathematical content for preschoolers is represented by numbers, relationships, geometry, and measurements and can be transmitted with the help of literature for children (Maričić et al., 2018). It can be supplemented with specific notions of groups, spatial positions, geometric shapes, adjectives, numerals, the quantity report to a number, and vice versa, counting in ascending-descending order and verbalizing actions (Mitu & Antonovici, 2005). The exercise materials, which consist of individual components, are employed to facilitate mathematical activities (MA), didactic games, and logical-mathematical games.

CA is part of the Language and Communication Domain (LCD). It includes both aspects of oral communication in known or diverse communication contexts, as well as premises of reading and writing in known communication contexts (MEN, 2019, p. 22). They aim to develop the skills of communication, language, vocabulary, grammar, and syntax. The teacher's story, the teacher's lecture, reading from pictures, memorization, conversation, and didactic games are among the traditional methods of transmitting knowledge specific to the LCD field. The stories, the fairy tales, and the age-specific real stories that are told to preschoolers are addressed to both the cognitive as well as affective areas (Albu et al., 2014; Knight, 1995; Rădulescu, 2019). These have the role of expanding the language by acquiring new words and expressions (Brodin & Renblad, 2019), developing imagination (Rădulescu, 2019), and transmitting values (Önder & Kanak, 2017). Reading is a means by which, in addition to the text heard, preschoolers get to know the book through the process of early literacy (Xoshimova, 2020).

## **Interactions of gender and teaching style on Mathematics and Language and Communication outcomes**

Depending on the gender variable, some researchers have reported differences between the results obtained by children in mathematics, and others have shown no notable differences. Of the studies that support differences between girls and boys, Brandlistuen et al. (2021) state that girls performed better than boys in the areas of early literacy and numeracy. Paz-Albo et al. (2017) mention differences in mathematical knowledge about the color sphere. Boys are attracted to red/blue toys and girls prefer pink/purple toys. The same research shows that girls prefer math more than boys.

Among the research that shows the absence of significant differences, Romero-Abrio (2021) claims that children's performance and skills are similar according to gender. The time spent playing with toys used in mathematics is similar for girls and boys (Paz-Albo et al., 2017). There are no significant differences between the numerical skills of preschool children according to gender (Bakker et al., 2018; Escudero et al., 2022). According to a correlational quantitative study conducted by Bagas et al. (2021), there is a positive and significant correlation between teaching style and learning performance. The correlation coefficient is 0.546, and teaching style accounts for 23% of the variance in learning performance.

## **METHODOLOGY**

The current research followed a quantitative approach. For this approach, the aim, objectives, variables, hypotheses and sample were established. The tools were identified and applied, after which the data necessary for the research was obtained. These were analyzed using statistical tests and then interpreted. Conclusions specific to the research were formulated. It can be considered descriptive because it used

demographic data, such as the teaching style of the teachers and the gender of the children, as independent variables.

### **The purpose of research**

The purpose of this study was to identify how teachers' teaching styles and children's gender determine significant differences in preschoolers' achievement in MA and CA.

### **Research objectives**

The research proposes the following objectives:

1. Identify significant differences between the results obtained by children at MA and CA depending on their gender.
2. Identify significant differences between the results obtained by children at MA and CA depending on the teachers' teaching styles.

### **Research variables**

For the current research, the dependent variables are partial outcomes at MA and CA, and the independent variables are children's gender and teachers' teaching style.

### **Null hypotheses of the research**

According to the teaching styles of the teachers and the gender of the children, four hypotheses were formulated. They assume that there are no significant differences between preschool results in MA and AC. The first two refer to the results of children in AM, which depend on their gender and the teaching style of the teachers. The last two refer to children's results at AC, according to the same two variables.

H<sub>0</sub>1. There are no statistically significant differences in mathematics learning outcomes according to the preschoolers' gender.

H<sub>0</sub>2. There are no statistically significant differences in mathematics learning outcomes according to the teachers' teaching styles.

H<sub>0</sub>3. There are no statistically significant differences in communication learning outcomes according to the preschooler's gender.

H<sub>0</sub>4. There are no statistically significant differences in communication learning outcomes according to teachers' teaching styles.

## **Population and sample**

The population was represented by preschoolers registered into Adventist educational units in Romania from the 2021-2022 school year. The number of preschool children aged 5-6 in these institutions was approximately 400. The sample selection was non-probability and convenience and consisted of 111 children from nine groups and 9 teachers. The inclusion condition refers to children from kindergartens belonging to the Adventist Church in Romania who have the consent of their parents to participate. Due to leaving the kindergarten, one participant was excluded from the study.

## **Research tools**

The tool used to measure the teaching style of educators was the Successful Intelligence Questionnaire (TSI-Q), created and validated by Paloş & Maricuţoiu (2013). The TSI-Q questionnaire contains a Romanian version. It comprises 20 items, assigned five to each of the four teaching styles: reproductive, analytical, practical, and creative. Responses were rated on a Likert scale from one to six (1 = very strongly disagree, 2 = strongly disagree, 3 = disagree, 4 = agree, 5 = agree strong, and 6 = very strong agreement). The questionnaire scales had good internal consistency, with Cronbach's alpha between 0.79 and 0.85.

The dependent variable, related to the learning results achieved by preschoolers at MA and at CA, were measured with the standardized Test Sheet Contest (Science and Arts Foundation, 2015a). Standardized tests were administered at the beginning of the semester. Considering the age group of 5-6 years, the tests included six subjects in the areas of MA and CA. They were accompanied by the correction scale (Science and Arts Foundation, 2015b).

### **Data analysis**

The data obtained from the application of the instruments were analyzed using PSPP/Jamovi software. A t-test for independent samples was applied to determine the significant differences in learning outcomes according to children's gender. To determine the significant differences in learning outcomes according to the teaching style of educators were analyzed by applying the One-Way ANOVA test and the non-parametric Kruskal-Wallis's test.

## **RESULTS**

To verify the null hypothesis, which assumes the absence of significant differences between the results obtained by preschoolers in the mathematics knowledge test according to the gender of the children, the T-test for independent samples was used. After applying this test, it was observed that there are no significant differences ( $t = -1.67$ ;  $p = 0.98$ ) between the results obtained by boys ( $M = 3.80$ ;  $SD = 1.50$ ) and the results obtained by girls ( $M = 4.21$ ;  $SD = 1.01$ ). The null hypothesis is not rejected (Table 1).

In order to verify the following null hypothesis, which claims that there are no significant differences between the results obtained by preschoolers in the communication knowledge test according to the gender of the children, the T-test for independent samples was used. After applying this test,

it was observed that there are no significant differences ( $t = -1.75$ ;  $p = 0.084$ ) between the results obtained by boys ( $M = 4.26$ ;  $SD = .98$ ) and the results obtained by girls ( $M = 4.53$ ;  $SD = .66$ ). As a result of these obtained results, the null hypothesis is not rejected.

The results obtained were analyzed for the four dimensions of teaching style: the creative style, the reproductive style, the analytical style, and the practical style. The data sets for the results obtained in preschool education were represented by MA and CA. For the Creative Style and MA dataset, the Homogeneity of Variance Test was applied. Levene  $F(2, 108) = 2.47$ ,  $p = 0.090$  ( $p > 0.05$ ) was obtained. The variances are equal, and the condition of homogeneity of variances is met, in which case One-Way ANOVA can be applied. After applying this analysis, it was observed that there are statistically significant differences depending on the different levels of creative style; thus,  $F(2, 108) = 10.42$ ,  $p = 0.000$  ( $p < 0.001$ ). Multiple comparison tests (Games-Howell) revealed differences between children of teachers with excellent and high levels ( $p = 0.003$ ), as well as between children of teachers with very high and high levels ( $p = 0,004$ ). Thus, the averages obtained by children with teachers with an excellent level of creative teaching style were higher ( $M = 4.33$ ) than those of children whose teachers had a very high level ( $M = 4.24$ ) for creative teaching style. The averages obtained by children with teachers with a very high level of creative teaching style were higher ( $M = 4.24$ ) than those whose teachers had a high level of creative teaching style ( $M = 3.03$ ). Creative teaching style influences preschoolers' achievement in MA. There are statistically significant differences between the scores obtained by children exposed to excellent, very high, and high creative styles. For this data set, the null hypothesis is rejected.

In MA, teachers' high levels of creativity, excellent, very high, and high positively influenced the creativity level of preschoolers exposed to this style. Differences are observable

between close levels of teachers' creativity. A possible reason why children with teachers with a creative teaching style and higher levels have achieved better results in MA would probably be the application of methods and means that require an increased degree of creativity in this domain. Regarding the Creative style and the data set obtained by preschoolers at CA, the Homogeneity of Variance Test was applied. Levene  $F(2, 108) = 0.001, p = 0.997 (p > 0.05)$  was obtained. Therefore, the variances are equal, and the condition of homogeneity of variances is met, and One-Way ANOVA can be applied. After using this analysis, it was observed that there are no statistically significant differences according to the different levels of creative style; thus,  $F(2, 108) = 1.46, p = 0.237 (p > 0.05)$ . Children's average results in CA did not show statistically significant differences according to high or low levels of teachers in terms of Creative Style ( $M = 4.41$ ). For this data set, the null hypothesis is not rejected. The level of creativity does not influence children's CA results. This is probably because the teachers' original and creative methods were more conducive to the development of communication than the classical methods currently used.

For the Reproductive Style, the MA data set was taken into account. Initially, the variances' homogeneity test was applied, and Levene  $F(3, 107) = 0.99, p = 0.339 (p > 0.05)$  was obtained. Therefore, the variances are equal, and the condition of homogeneity of variances is met, and One-Way ANOVA can be applied. After performing this analysis, it was observed that there are statistically significant differences depending on the different levels of reproductive style, like  $F(3, 107) = 6.87, p < 0.001$ . Multiple comparison tests (Games-Howell) revealed differences between the children belonging to high-level teachers and very low-level teachers ( $p = 0.007$ ). Thus, the averages obtained by the children of teachers with a high level of reproductive teaching style were higher ( $M = 4.37$ ), than the averages of children whose teachers had a very low level of

reproductive teaching style ( $M = 2.44$ ). Children who have teachers with very low levels of the reproductive style have lower outcomes than children with teachers who have high levels of the reproductive teaching style. The null hypothesis is rejected for this data set. Reproductive style influences preschoolers' environments at MA. Teachers with lower reproductive styles will likely have considered methods that involve reproducing knowledge inappropriate for MA and used more appropriate methods to apply to this domain. The following analysis of Reproductive Style considered the data set of preschoolers at CA. The Homogeneity of Variance Test was applied, and Levene  $F(3, 107) = 2.77, p = 0.045$  ( $p < 0.05$ ) was obtained. ANOVA cannot be applied, but the non-parametric Kruskal-Wallis test will be used. Thus,  $H(3) = 5.75, p = 0.124$ . The results indicate that there are no statistically significant differences between children's CA averages according to very high and very low levels of reproductive teachers' teaching styles. The null hypothesis is not rejected for this data set. Reproductive teaching style does not influence children's CA results. This is probably due to the fact that knowledge replication is used to a lesser extent, or the use of methods specific to this style does not visibly interact with the results.

The data set for the following Analytical Style analysis was represented by the results at MA. The Homogeneity of Variance Test was applied, and Levene  $F(3, 107) = 2.40, p = 0.072$  ( $p > 0.05$ ) was obtained. Therefore, the variances are equal, and the condition of homogeneity of variances is met, and One-Way ANOVA can be applied. After using this analysis, it was observed that there are statistically significant differences depending on the different levels of analytical style; thus,  $F(3, 107) = 7.87, p < 0.001$ . Multiple comparison tests (Games-Howell) revealed differences between children of teachers with excellent and average levels ( $p = 0.008$ ), as well as between children of teachers with average and high levels ( $p = 0.001$ ). Thus, the averages obtained by children who have teachers

with an excellent level of analytical teaching style were higher ( $M = 4.22$ ) than the averages of children whose teachers had an average level of analytical teaching style ( $M = 3.03$ ). The averages obtained by the children of teachers with a high level of analytical teaching style were higher ( $M = 4.62$ ) than the averages of children whose teachers had an average level of analytical teaching style ( $M = 3.03$ ). Analytical teaching style influences preschoolers' achievement in MA. There are statistically significant differences between the scores obtained by children exposed to the excellent, high, and average analytical style. For this data set, the null hypothesis is rejected. The analytical teaching style of teachers influences the results of preschoolers in MA. This is probably due to the tendency of teachers who have this teaching style to pay more attention to details, which will be passed on to the children. The results at CA represented the data set for the following Analytical Style analysis. The Homogeneity of Variance Tests was applied, and Levene  $F(3, 107) = 0.08, p = 0.972$  ( $p > 0.05$ ) was obtained. Therefore, the variances are equal, and the condition of homogeneity of variances is met, and One-Way ANOVA can be applied. After using this analysis, it was observed that there are no statistically significant differences according to the different levels of analytical style; thus,  $F(3, 107) = 2.45, p = 0.068$  ( $p > 0.05$ ). Analytical teaching style does not influence preschoolers' results in CA. There are no statistically significant differences between the initial averages obtained by children exposed to different levels of analytical style at CA ( $M = 4.41$ ). Teachers' analytical teaching styles do not influence preschoolers' CA results. For this data set, the previously observed trend does not hold, indicating that analytical style does not interfere with CA, and the null hypothesis is not rejected.

Depending on the Practical Style, the approach continued analyzing the averages obtained by preschoolers in MA. The variances' homogeneity test was initially applied, and Levene  $F(3, 107) = 1.45, p = 0.232$  ( $p > 0.05$ ) was obtained. Therefore,

the variances are equal, and the condition of homogeneity of variances is met, and One-Way ANOVA can be applied. After using this analysis, it was observed that there are statistically significant differences according to the different levels of practical style; thus,  $F(3, 107) = 8.10, p < 0.001$ . Multiple comparison tests (Games-Howell) revealed differences between children of excellent and low-level teachers ( $p = 0,010$ ), as well as between children of very high and low-level teachers ( $p = 0.008$ ). Thus, the averages obtained by the children of teachers with an excellent level of practical teaching style were higher ( $M = 4.26$ ) than the averages of children whose teacher had a low level of practical teaching style ( $M = 2.44$ ). The averages obtained by the children of teachers with a very high level of practical teaching style were higher ( $M = 4.31$ ), than the averages of children whose teachers had a low level of practical teaching style ( $M = 2.44$ ). Hands-on teaching style influences preschoolers' achievement in MA. There are statistically significant differences between the means of results achieved by children in MA and the level (excellent, very high, low) according to the practical teaching style. For this data set, the null hypothesis is rejected. Different levels of practical style significantly influence preschoolers' achievement in MA. This can be explained by the fact that teachers with a superior practical style are more likely to regularly use practical methods, which are much more effective in achieving superior results. Preschoolers' results at CA represented the data set involved in the following Practical Style analysis. The Test of Homogeneity of Variance was applied and Levene  $F(3, 107) = 0.21; p = 0.888 (p > 0.05)$  was obtained. Therefore, the variances are equal, and the condition of homogeneity of variances is met, and One-Way ANOVA can be applied. After using this analysis, it was observed that there are no statistically significant differences according to the different levels of practical style; thus,  $F(3, 107) = 0.72; p = 0.540 (p > 0.05)$ . There are no statistically significant differences between the averages

obtained by children exposed to different levels of practical style at CA ( $M = 4.41$ ). For this data set, the null hypothesis is not rejected.

Teaching style does not influence the results of preschoolers in CA. For all four teaching styles, the results obtained by preschoolers in CA for the null hypothesis data set are not rejected. It is likely that practical teaching methods are not frequently used in this area, or if they are used, they are not as effective in achieving superior results. Teaching style influences the results of preschoolers in MA. For all four data sets the results obtained by preschoolers at MA, the null hypothesis is rejected.

## **DISCUSSIONS**

No differences were recorded between the results obtained by girls and boys. Learning takes place in similar ways in both genders. However, some authors mention the absence of significant differences according to gender in MA (Romero-Abrio, 2021). Some authors refer to similarities according to the gender in the numerical skills of preschool children (Bakker et al., 2018; Escudero et al., 2022), as well as the time children use toys for MA (Paz-Albo et al., 2017). Other authors mention differences between the results achieved by children according to gender. Brandlistuen et al. (2021) state that girls scored better than boys, and Paz-Albo et al. (2017) say that girls prefer math more than boys, and there are color preferences. At this level of education, the differences between boys and girls are not very important. The teachers take care to give the same attention to each person, and the reaction of the children to the lesson is, in general, identical. The differences grow over time, and they become more visible in adolescence.

A possible reason why children with teachers with a creative teaching style and higher levels have achieved better

results in MA would probably be the application of methods and means that require increased creativity in this domain. Teachers' creative teaching style influences children's creativity, which uses some new strategies and develops children's ability to apply them (Haertel et al., 2016). Among the methods creative teachers use to stimulate children's creativity are creating stories and brainstorming (Horng et al., 2005).

Reproductive style influences preschoolers' achievement at MA. Teachers with lower reproductive styles are likely to consider methods that involve reproducing knowledge inappropriate for MA and use more appropriate methods to apply to this domain. Teachers' analytical teaching style influences preschoolers' results in MA. This is probably due to the tendency of teachers who have this teaching style to pay more attention to details, which will be passed on to the children. Different levels of practical style significantly influence preschoolers' achievement in MA. This can be explained by the fact that teachers with a superior practical style are more likely to regularly use practical methods, which are much more effective in achieving superior results. For MA, teachers' teaching styles influence children's results and are directly proportional to high levels. Bagas et al. (2021) support this idea by stating that there is a positive correlation between teaching style and learning performance.

The level of creativity does not influence children's CA results. This is probably because the teachers' original and creative methods were more conducive to the development of communication than the classical methods currently used. Reproductive teaching style does not influence children's CA results. This is probably due to the fact that knowledge replication is used to a lesser extent, or the use of methods specific to this style does not visibly interact with the results. The analytical teaching style of teachers does not influence preschoolers' results in CA. For this data set, the previously observed trend does not hold, indicating that analytical style does not

interfere with teaching style practically and does not influence the results of preschoolers in CA. It is likely that practical teaching methods are not frequently used in this area, or if they are used, they are not as effective in achieving superior results in CA.

## **CONCLUSIONS**

There were no significant differences between the results obtained by male and female participants. Certain variations exist in the outcomes of CA and MA. So, creative teaching style influences preschoolers' achievement in MA. There are statistically significant differences between the scores obtained by children exposed to excellent, very high, and high creative styles. However, the level of creativity does not influence children's CA results. This is likely because the teachers' original and creative methods are more effective for communication development than classical methods.

Reproductive style influences preschoolers' environments at MA. Teachers with lower reproductive styles will likely have considered methods that involve reproducing knowledge inappropriate for MA and used more appropriate methods to apply to this domain. Teachers' analytical teaching style influences the results of preschoolers in MA. This teaching style often emphasizes details, which teachers pass on to students. Different levels of practical style significantly influence preschoolers' achievement in MA. This can be explained by the fact that teachers with a superior practical style are more likely to regularly use practical methods, which are much more effective in achieving superior results. Teaching style does not influence the results of preschoolers in CA. It is likely that practical teaching methods are not frequently used in this area, or if they are used, they are not as effective in achieving superior results.

Considering that the limitation concerns the sample's non-probabilistic selection, we could not select a representative group from each group of preschoolers. The sample chosen was also of convenience due to the immediate post-pandemic context. Future research needs to take this into consideration and use a representative group for the study. It is important to replicate the study with new samples to verify the generalizability of the current findings.

It is recommended that the research continue by introducing other variables. One such variable would be parenting style. This would allow us to observe whether there are significant differences between the results obtained by children at AM and AC depending on parenting styles. Future research can also carry out complementary qualitative research, which could surprise other aspects and offer explanations that could not be included in the quantitative component.

## REFERENCES

- Achmad, D., Muslem, A., Rahmanita, T., & Khan, H. I. (2023). Investigating students' expectations of the lecturers' styles in teaching English. *English Review: Journal of English Education*, 11(1), 301–314. <https://doi.org/10.25134/erjee.v11i1.7972>
- Albu, B., Cotârlea, M., Har, D., Hodadea, Ș., Incze, E., Miclea, M., Moldovan, F., Radu, A., & Țibrea, M. (2014). Language and Communication domain. In L. Tătaru, A., Glava & O., Chiș (Eds.), *Pyramid of knowledge. Methodical milestones in the application of the preschool curriculum* (pp. 207–309). Diamant.
- Antonovici, Ș. (2016). *Mathematics in kindergarten. Guide for educators*. Didactica Publishing House.
- Arabsheybani, K., & Akhondi, N. (2018). Validation and verification of factor structure of teaching Strenberg intelligence questionnaire (TSI-Q) in teachers. *Biquarterly Journal of Cognitive Strategies in Learning*, 5(9), 49–60. <http://dx.doi.org/10.22084/j.psy-chogy.2017.10612.1349>

- Bagas, A. A., Fatun, F. A., Ali, M., & Colomeischi, A. A. (2021). Teaching style, learning motivation, and learning achievement: Do they have significant and positive relationships? *Jurnal Prima Edukasia*, 9(1), 23–31. <https://doi.org/10.21831/JPE.V9I1.33770>
- Bakker, M., Torbeyns, J., Wijns, N., Verschaffel, L., & Smedt, B. D. (2018). Gender equality in 4- to 5-year-old preschoolers' early numerical competencies. *Developmental Science*, 22(1). <https://doi.org/10.1111/desc.12718>
- Bramwell, G., Reilly, R. C., Lilly, F. R., Kronish, N., & Chennabathni, R. (2011). Creative teachers. *Roeper Review*, 33(4), 228–238. <https://doi.org/10.1080/02783193.2011.603111>
- Brandlistuen, R. E., Flatø., M., Stoltenberg, C., Saugestad Helland, S., & Vaage Wang, M. (2021). Gender gaps in preschool age: A study of behavior, neurodevelopment and pre-academic skills. *Scandinavian Journal of Public Health*, 49(5), 503–510. <https://doi.org/10.1177/1403494820944740>
- Brodin, J., & Renblad, K. (2019). Improvement of preschool children's speech and language skills. *Early Child Development and Care*, 1–9. <https://doi.org/10.1080/03004430.2018.1564917>
- Dumitrana, M. (2002). *Mathematical activities in kindergarten: a practical guide, accompanied by 105 activity suggestions*. Compania.
- Escudero, A., Lago, M. O., & Dopico, C. (2022). Gender similarities in the mathematical performance of early school-age children. *Mathematics*, 10(17), 3094. <https://doi.org/10.3390/math10173094>
- Fleming, N. D., & Bonwell, C.C. (2019). *How do I learn best? A learner's guide to improved learning*. VARK.
- Haertel, T., Terkowsky, C., & Radtke, M. (2016). Creative students need creative teachers – fostering the creativity of teachers: A blind spot in higher engineering education? *Engineering Education*, 4, 949–955. [https://doi.org/10.1007/978-3-319-46916-4\\_77](https://doi.org/10.1007/978-3-319-46916-4_77)
- Husin, N., Mat, A. C., Husin, N. H. R., & Hashim, N. (2023). Decoding teaching styles of language lecturers. *International Journal of Academic Research in Business and Social Sciences*, 13(6), 1914–1929. <https://doi.org/10.6007/ijarbss/v13-i6/17256>
- Knight, G. (1995). *Philosophy of Christian Education*. Card.

- Lozano-Rodríguez, A., García-Cue., J. L., García-Vázquez., F. I., & Gallardo-Córdova, K. E. (2020). Relationship between teaching styles and formative evaluation in Secondary Education. *Revista de Estudios de Aprendizaje*, 13(26), 160–172.
- Manolescu, M. (2019). Assessment in preschool education. In I. O. Pânișoară & M. Manolescu, (Eds.), *Pedagogy of primary and preschool education*, Vol. 1. (pp. 552–583). Polirom.
- Maričić, S. M., Stakić. M. M., & Malinović-Jovanović, N. T. (2018). The role of literary content for children in preschool mathematics education. *EURASIA Journal of Mathematics, Science and Technology Education* 14(2), 631–642. <https://doi.org/10.12973/ejmste/80627>
- Menegale, M. (2008). Expanding teacher-student interaction through more effective classroom questions: From traditional teacher-fronted lessons to student-centred lessons in CLIL. *Università Ca' Foscari*, 107–127.
- Ministry of National Education. (2019). *Curriculum for early education (for children from birth to the age of 6)*. [https://www.edu.ro/sites/default/files/Curriculum%20ET\\_2019\\_aug.pdf](https://www.edu.ro/sites/default/files/Curriculum%20ET_2019_aug.pdf)
- Mitu, F., & Antonovici, Ș. (2005). *Methodology of language education activities in preschool education*. Humanitas Educațional.
- Önnder, M., & Kanak, M. (2017). Teaching values with stories and tales in the preschool period. *Journal of Education and Practice*, 8(30), 143–149.
- Paloș, R., & Maricuțoiu, L. (2013). Teaching for successful intelligence questionnaire (TSI-Q)– a new instrument developed for assessing teaching style. *Journal of Educational Sciences & Psychology*, 65(1), 159–178.
- Paz-Albo, J., Cvencek, D., Herranz Llácer, C. V., Hervás, Escobar, A., & Meltzoff, A. N. (2017). Preschoolers' mathematical play and colour preferences: a new window into the development of gendered beliefs about math. *Early Child Development and Care*, 187(8), 1273–1283. <https://doi.org/10.1080/03004430.2017.1295234>
- Puiggali, J., & Tesour, M. (2021). Influence of contextual variables on the teaching approach: relationship between teaching approach and learning style. *Aula abierta*, 50(1), 481–490. <https://doi.org/10.17811/rifie.50.1.2021.481-490>

- Rădulescu, C. (2019). Didactics of language and communication. In I. O. Pânișoară & M. Manolescu, (Coord.), *Pedagogy of primary and preschool education*, Vol. 2. (pp.145–175). Polirom.
- Ridwan, H., Sutresna, I., & Haryeti, P. (2019). Teaching styles of the teachers and learning styles of the students. *Journal of Physics: Conference Series*. <https://doi.org/10.1088/1742-6596/1318/1/012028>
- Romero-Abrio, A., Ramos-Alonso, R., & Hurtado-Bermúdez, S. (2021). Gender equality in five- to six-year-old preschoolers' early competences in science do not protect schoolgirls from gender stereotypes. *European Early Childhood Education Research Journal*, 29(4), 479–500. <https://doi.org/10.1080/1350293X.2021.1941165>
- Sarıtaş, E. (2016). Relationship between philosophical preferences of classroom teachers and their teaching styles. *Educational Research and Reviews*, 11(16), 1533–1541. <https://doi.org/10.5897/ERR2016.2787>
- Science and Arts Foundation “Parallel 45” (2015a). *COMPETITION SHEET*. International Competition of Integrated Activities TIMTIM-TIMY 2015-2016 - Stage I - 5-6 years old group. [https://timtim-timy.ro/sites/all/themes/timtimtimy/pdf/subiecte-concurs/2015-2016/etapa-1/subiect\\_5-6\\_ani.pdf](https://timtim-timy.ro/sites/all/themes/timtimtimy/pdf/subiecte-concurs/2015-2016/etapa-1/subiect_5-6_ani.pdf)
- Science and Arts Foundation “Parallel 45”. (2015b). *CORRECTION SCALE*. International Competition of Integrated Activities TIMTIM-TIMY 2015-2016 - Stage I - 5-6 years old group. [https://timtim-timy.ro/sites/all/themes/timtimtimy/pdf/subiecte-concurs/2015-2016/etapa-1/barem\\_5-6\\_ani.pdf](https://timtim-timy.ro/sites/all/themes/timtimtimy/pdf/subiecte-concurs/2015-2016/etapa-1/barem_5-6_ani.pdf)
- Xoshimova, D. R. (2020). Using effective methods in preschool and primary school educational system. *Science and Education Scientific Journal*, 1(5), 170–173.
- Yang, Y., Liu, S. L., Y.Y., Wen, D. Q., Xiong B. B., & Xu, T. (2017). A study on the dimension model of “teaching style, study style and examination discipline” of teachers evaluate student classes. *Social Science, Education and Human Science*. <https://doi.org/10.12783/dtssehs/icesd2017/11552>

## APPENDICES

**Table 1**

*The results obtained by preschoolers according to the gender variable*

	Group	N	Mean	Std. Deviation	S.E. Mean
AM	male	52	3,80	1,50	,21
	female	59	4,21	1,01	,13
AC	male	52	4,26	,98	,14
	female	59	4,53	,66	,09