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The Effect of Drama Applications in Education on Pre-Service Teachers' Communication and Problem-Solving Skills

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Abstract This study examines changes in pre-service teachers' communication and problem-solving skills across a semester-long course incorporating drama-based educational practices. A quantitative, single-group pretest–posttest design was employed to examine changes between measurements taken before and after the educational drama course, without a separate control group. The study involved 30 pre-service teachers enrolled in a faculty of education in Türkiye during the spring semester of the 2025–2026 academic year who participated in an education-focused drama course. Participants were selected through criterion-based, nonprobability sampling, with enrollment in the drama course serving as an essential inclusion condition. The Communication Skills Scale and the Problem-Solving Skills Scale were used as data collection instruments in the study. The authors reported paired-samples t-tests to compare participants' scores at the two measurement occasions, alongside descriptive and normality statistics. Reported mean communication scores increased from 2.75 at pretest to 3.31 at posttest, and mean problem-solving scores increased from 2.20 to 2.33; the original analysis reports statistically significant paired comparisons, although the communication test statistics require reconciliation. These changes are consistent with the potential educational value of drama-based instruction, but a single-group design cannot establish that the course itself, rather than other time-related factors, caused the observed differences. Accordingly, the study recommends further exploration of structured drama activities within practice-based teacher preparation, ideally using controlled designs and independently verified statistical results.

Index Terms educational drama; pre-service teachers; communication skills; problem-solving skills; teacher education

I. Introduction

In recent years, education systems have moved away from the traditional approach, which aimed solely to improve pupils' academic achievement, and have shifted towards a competence-based approach centred on the development of higher-order skills such as communication, collaboration, critical thinking, creativity and problem-solving. This transformation requires teachers not only to possess subject-specific knowledge but also to be able to design learning environments that support pupils' cognitive, social and emotional development. Consequently, it is becoming increasingly important for teacher training programmes to incorporate student-centred teaching approaches that develop pre-service teachers' fundamental professional competencies—such as communication, collaboration and problem-solving—in addition to their professional knowledge and skills. Contemporary education systems aim to develop not only individuals' academic achievements but also their 21st-century skills [1]–[3]. In achieving this objective, the strong communication and problem-solving skills of teachers and trainee teachers play a critical role [4].

Drama in education is recognised as one of the effective pedagogical approaches aimed not only at the academic learning of trainee teachers, but also at developing their skills in social interaction, empathy, self-awareness and collaboration [5]. Drama in education is an experience-based learning approach that enables individuals to learn by drawing on their own life experiences through techniques such as improvisation, role-play and dramatisation [6]. Consistent with the constructivist approach to learning, this method supports learners in constructing knowledge through active participation and contributes to the professional and personal development of trainee teachers [7], [8].

Communication skills are recognised as one of the core competencies of the teaching profession and play a decisive role in delivering effective teaching. The quality of the communication that teachers establish with their pupils, colleagues, school leaders and parents directly influences the effectiveness of the learning environment, the classroom atmosphere and pupils' academic and social development. Nowadays, teacher competencies are not limited solely to subject knowledge and pedagogical knowledge; interpersonal skills such as effective communication, the ability to empathise, fos-

tering collaboration and managing differing viewpoints constructively are also recognised as indispensable components of the teaching profession [1], [3]. It is therefore important for teacher training programmes to provide practical learning experiences that develop trainee teachers' communication skills.

One of the pedagogical approaches considered effective in developing trainee teachers' communication skills is the use of drama in education. Drama in education is an experience-based learning approach that enables individuals to experience different roles, understand different perspectives and learn through social interaction [5], [6], [9]. The activities carried out during the drama process—such as improvisation, role-play, group discussions and dramatisations—enable participants not only to express themselves verbally, but also to develop active listening, empathy, the ability to provide feedback and non-verbal communication skills. In this respect, drama in education treats communication not merely as a process of transmission, but as a social learning experience in which meaning is co-constructed.

Research carried out in recent years also supports this theoretical approach. Walan [7] noted that drama-based teaching practices enable trainee teachers to participate more actively in their learning processes and strengthen their professional communication skills. Similarly, Yüksel, Şenol and Akyol [10] demonstrated that drama lessons in education significantly improve the communication skills of trainee primary and pre-school teachers. More recent research, however, indicates that drama pedagogy supports pre-service teachers' abilities to express themselves, develop collaboration, think empathetically and create democratic learning environments [8], [11], [12]. Furthermore, it has been reported that creative drama practices not only enhance communication skills but also boost trainee teachers' self-confidence, strengthen classroom interactions and contribute to the development of their professional identity [9], [13].

Effective communication is a fundamental professional competence that enables teachers to build trust-based relationships, manage classroom interactions and support pupils' holistic development [14]–[16]. Whilst the development of this skill in trainee teachers requires experiential and practical learning environments that go beyond theoretical lessons, this process—which is grounded in social-emotional and democratic classroom practices—directly strengthens trainees' professional self-efficacy, classroom management and student engagement [17]–[19].

However, a review of the existing literature reveals some significant limitations. Firstly, a substantial proportion of the research focuses solely on communication skills and does not sufficiently examine the holistic impact of drama activities in conjunction with other professional competencies. Furthermore, whilst a significant proportion of the studies focus on short-term drama activities, there appears to be a limited number of quasi-experimental studies examining the impact of drama lessons—conducted over the course of a term within teacher training programmes—on communication skills. This situation highlights the need for new research to demonstrate the impact of long-term and planned drama practices on the development of pre-service teachers' communication skills. In this regard, evaluating communication skills in conjunction with problem-solving skills will enable a more comprehensive understanding of the contribution that drama in education makes to the teacher training process.

The teaching profession requires not only subject knowledge and pedagogical competence, but also the ability to devise effective solutions to complex situations that arise. Teachers encounter multi-faceted situations in the classroom, such as student diversity, communication issues, learning difficulties and unexpected behavioural problems. For this reason, the development of problem-solving skills in teacher education is regarded as a key aspect of trainee teachers' professional competence [20]. Problem-solving is a dynamic skill comprising cognitive processes such as identifying the problem, analysing the problem, developing alternative solutions, selecting the appropriate solution and evaluating the outcome.

It is stated that experiential learning approaches make significant contributions to the development of pre-service teachers' problem-solving skills. Experiential learning is based on the individual learning through direct experiences, evaluating these experiences, and being able to apply them to new situations. It is stated that the application of experiential learning in teacher education enables trainee teachers to encounter real classroom problems and to experience the process of devising solutions [21]. In this context, practical activities based on problem scenarios support trainee teachers not only in acquiring knowledge but also in developing their critical thinking, decision-making and problem-solving skills.

Drama in education is regarded as one of the effective experiential methods for developing pre-service teachers' problem-solving skills. Drama activities enable individuals to develop different perspectives through processes such as role-play, improvisation, dramatisation and reflective evaluation. In particular, addressing classroom issues through dramatic scenarios helps trainee teachers to experience potential professional challenges in a safe learning environment and to develop solutions [22].

Drama-based approaches support pre-service teachers' cognitive, social and emotional skills in their problem-solving processes. A study conducted by Seyedi [23] found that psychodrama techniqseyedues had a positive impact on pre-service teachers' problem-solving skills, critical thinking and decision-making processes. Similarly, it has been observed that drama-based activities enhance pre-service teachers' pedagogical thinking processes and increase their awareness of complex teaching situations [7]. Learning environments created through drama enable pre-service teachers to take on different roles, view situations from different perspectives and develop alternative solution strategies.

The development of problem-solving skills in teacher education is not limited solely to individual cognitive processes; it is also linked to social processes such as collaboration, communication and reflective thinking. Csanadi, Kollar

and Fischer [24] have demonstrated that collaboration and evidence-based thinking are important in pre-service teachers' processes of generating solutions to pedagogical problems. For this reason, the interactive and participatory learning environments offered by educational drama can be regarded as a powerful tool for developing pre-service teachers' problem-solving competencies.

In conclusion, drama in education is an experiential and student-centred approach to learning that supports pre-service teachers' ability to devise solutions to the professional challenges they may encounter. Through drama activities, pre-service teachers analyse problem situations, develop different solutions and gain experience of professional decision-making processes. In this respect, it is considered that educational drama can make a significant contribution to the development of problem-solving skills in teacher training.

In teacher education today, it is no longer considered sufficient merely to train teachers with subject-specific knowledge; developing pre-service teachers' higher-order skills—such as the ability to analyse complex educational situations, make effective decisions, communicate and solve problems—has become increasingly important. By the very nature of the teaching profession, teachers encounter a variety of student characteristics, issues with classroom interaction and unexpected teaching situations. For this reason, the development of problem-solving skills among trainee teachers is regarded as a key aspect of their professional competence [20].

Problem-solving skills comprise a multidimensional structure involving cognitive processes such as identifying a problem encountered by an individual, analysing the problem, devising alternative solutions, selecting the appropriate solution, and evaluating the outcomes. The development of problem-solving skills among trainee teachers not only enhances their academic achievement but also enables them to make more effective and informed decisions regarding the problems they will encounter in their professional lives [11]. In this context, it is essential to create active and practice-based learning environments within teacher training programmes that support the development of problem-solving skills.

A general review of the existing literature reveals that drama-based learning practices have a positive impact on pre-service teachers' various professional skills. However, it is evident that a significant proportion of the research focuses on the effects of drama practices on communication skills, creativity, empathy and teaching competence; whilst studies directly addressing the development of pre-service teachers' problem-solving skills through drama are more limited. Furthermore, the limited number of studies that examine the impact of educational drama on both the communication and problem-solving skills of trainee teachers using an experimental research design represents a significant research gap.

In this context, the aim of the present study is to examine the effect of drama-based practices in education on pre-service teachers' communication and problem-solving skills. The study is significant in that it highlights the importance of experiential and practice-based learning processes in teacher education and explains the role of the drama method in developing pre-service teachers' professional skills. Furthermore, the study will contribute to the evaluation of drama courses in teacher training programmes not merely as a practice that develops creative expression skills, but as a holistic learning approach that supports the ability to generate solutions to problem situations, establish effective communication and make professional decisions. Within this scope, the study sought to answer the following questions:

1. Does the use of drama in education significantly improve trainee teachers' communication skills?

2. Does the use of drama in education significantly improve trainee teachers' problem-solving skills?

II. Method

This section of the study discusses the research model, the study group, the data collection process and data collection tools, data analysis, ethical principles, and the implementation process.

The study used a quantitative, single-group pretest–posttest (pre-experimental) design in which the same participants were assessed before and after the intervention; there was no comparison or randomised control group. Experimental research designs can be used to assess relationships between interventions and measured outcomes, although causal inference requires appropriate controls and attention to potential confounding factors [25]. In the present single-group design, measurements were obtained before and after exposure to the course. Without a control group, the observed change may also reflect maturation, repeated testing, or other influences occurring over the study period [26]–[28].

The study group consisted of 30 pre-service teachers enrolled in a faculty of education during the spring semester of the 2025–2026 academic year. Participants were selected using criterion sampling. The sample was drawn from teacher candidates who were enrolled in the drama in education course and volunteered to participate in the study. The primary criterion was that participants be enrolled in the drama in education course. The personal information of the teacher candidates participating in the study is presented in Table 1.

Table 1: Demographic Characteristics of the Participating Pre-Service Teachers

Variable	Category	n	%
Gender	Female	27	90.0
Gender	Male	3	10.0
Undergraduate programme	Psychological Counseling and Guidance	14	46.7
Undergraduate programme	Turkish Language Teaching	9	30.0
Undergraduate programme	Elementary School Teaching	4	13.3
Undergraduate programme	Early Childhood Education	3	10.0
Total	—	30	100.0

The participants were reported to be 18–30 years of age, with a mean age of 21.7 years. Table 1 summarises the gender and undergraduate programme distribution; age was reported in the text rather than as a separate tabulated characteristic.

The researchers administered the instruments and analysed the responses. Two self-report measurement scales were used to assess the outcome variables at both time points.

The "Communication Skills Scale," developed by Akkuzu and Akkaya [29], was used to measure participants' levels of communication skills. The scale is a 5-point Likert-type scale and consists of a total of 36 items. Validity and reliability analyses of the scale have been completed. Accordingly, item statistics, consistency, and construct validity were assessed, and Cronbach's alpha reliability coefficient was calculated. Zinbarg and colleagues [30] discuss the relationship between Cronbach's alpha and alternative reliability coefficients, while Gliem and Gliem [31] outline procedures for reporting alpha for Likert-type instruments. Alpha should be interpreted as an index of internal consistency rather than as evidence of validity or stability over time. For this scale, the Cronbach's alpha values for the "competence—discouragement—body language—instilling respect" factors were calculated as 0.87, 0.83, 0.74, and 0.70, respectively. Additionally, the Cronbach's alpha coefficient for the entire scale is $\alpha = 0.89$. Given the high values of the scale's factors and reliability coefficients, it can be concluded that the scale is reliable and that the scale items exhibit a homogeneous structure. The lowest possible score participants can achieve on the communication skills scale is 36, while the highest is 180 [29]. As a result of the reliability analysis in this study, the scale's Cronbach's alpha coefficient was found to be $\alpha = 0.76$. This coefficient indicates an acceptable level of internal consistency in the present sample, although it does not independently establish all aspects of measurement validity.

The "Problem-Solving Skills Scale," originally developed by Yaman and Dede [32], was reportedly used to determine the participants' problem-solving skills. The manuscript describes a five-point Likert instrument administered with 30 items; however, the published scale-development study reports an 18-item final validated version, making the actual administered item set an essential point for author verification. Validity and reliability analyses of the scale have been completed. Accordingly, a 40-item test was administered to determine the reliability level. Following pilot measurement, an initial 40-item pool was reportedly reduced by removing 10 items in the manuscript's account, and reverse coding was used for negatively phrased items. Because the cited original scale ultimately contains 18 items, the item count and reported original alpha of $\alpha = 0.87$ should be reconciled with the primary scale publication and the instrument administered in this study. It can be stated that a measurement instrument with this level of reliability is considered highly reliable in the field of education [32]. As a result of the reliability analysis in this study, the scale's Cronbach's alpha coefficient was found to be $\alpha = 0.82$. This coefficient indicates an acceptable level of internal consistency in the present sample, although it does not independently establish all aspects of measurement validity.

The Shapiro–Wilk test was used to examine the marginal distributions of pretest and posttest scores. Because the paired-samples t test assumes an approximately normal distribution of within-person differences rather than separately normally distributed pretest and posttest scores, an assessment of the paired differences remains necessary. The original analysis nevertheless reports paired-samples t tests for both outcomes. Descriptive statistics (mean and standard deviation) were calculated to illustrate the central tendency and dispersion characteristics of the data. Statistical analyses were conducted using the SPSS 25.0 software package.

The study was conducted during the spring semester of the 2025–2026 academic year and lasted 14 weeks. During the first week of the study, participants were administered a pretest consisting of a communication skills scale and a problem-solving skills scale in the drama studio of the college of education where the study was conducted. Subsequently, the researchers conducted drama classes once a week. At the end of the process, in the 14th week, the Communication Skills Scale and the Problem-Solving Skills Scale were administered to the same group as posttests. The pretest and posttest scores were then compared for each participant. Because no untreated comparison group was observed, any differences should be interpreted as temporal associations rather than as effects uniquely attributable to the course. The weekly sequence of drama activities conducted during the course is presented in Table 2.

III. Findings

This section of the study presents the findings based on the data collected as part of the research.

Table 3 presents the results of the normality test conducted to determine whether the pretest and posttest scores of teacher candidates on communication skills met the assumption of a normal distribution. Since the study group size was less than 50 (N = 30), the Shapiro-Wilk test was used to assess the data's conformity to a normal distribution [33]. The results of the analyses revealed that the Shapiro-Wilk test result for the pretest scores on communication skills of the teacher candidates was statistically insignificant ($p = .062 > .05$). The skewness value for the pretest scores was calculated as 0.501 and the kurtosis value as 0.678; since these values fall within the range of ± 1.5 [34] or ± 2.0 [35], it was concluded that the pretest scores followed a normal distribution.

Similarly, it was determined that the result of the Shapiro-Wilk test for communication skills posttest scores was also statistically insignificant ($p = .270 > .05$). The skewness value of the posttest scores was calculated as 0.453 and the kurtosis value as 0.541; since these values fell within the specified reference ranges, it was confirmed that the posttest distribution met the assumption of normality. Taken together, the marginal pretest and posttest score distributions did not significantly depart from normality under the reported tests. These results do not, however, establish the assumption for the paired-samples t test, which concerns the distribution of each participant's pretest-to-posttest difference. The distribution of these paired differences should therefore be examined using the original observations. The results are presented in Table 4.

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Table 2: Drama Activities Conducted During the 14-Week Course

Week	Content/Theme	Drama Techniques and Course Content
1	Introduction and Orientation	Course introduction, getting to know one another, defining drama, and reviewing basic concepts
2	Relationship Between Drama and Play	Icebreaker and warm-up games
3	Components of Drama	Introducing the leader/teacher, participant group, dramatic space, subject matter, and materials
4	Stages of Drama	Preparation and warm-up exercises, enactment or activation, and evaluation procedures
5	Basic Drama Techniques and Applications	Practical applications of improvisation, pantomime (non-verbal expression), and role-playing
6	Basic Drama Techniques and Applications	Advanced techniques including frozen image, corridor of consciousness, hot seat, and gossip circle
7	Sensory and Physical Development	Movement, rhythm, and music in drama activities
8	Communication, Empathy, and Trust Workshops	Developing communication, empathy, self-expression, self-confidence, and problem-solving through educational drama
9	Stages of Development	Selecting age-appropriate drama activities for preschool, primary, secondary, and higher education
10	Curriculum Integration	Preparing an original drama lesson plan aligned with learning objectives and containing warm-up, activity, and evaluation stages
11	Application Examples	Presentation and evaluation of student-group drama plans
12	Application Examples	Performance and evaluation of student-group drama plans
13	Application Examples	Enactment and evaluation of student-group drama plans
14	End-of-Term Evaluation	Identifying problems encountered during drama applications, proposing solutions, and evaluating the overall course

Table 3: Shapiro–Wilk Tests and Distributional Statistics for Communication Skills

Measurement	N	Shapiro–Wilk W	df	p	Skewness	Kurtosis
Pretest	30	0.934	30	0.062	0.501	0.678
Posttest	30	0.958	30	0.270	0.453	0.541

Table 4 presents the source-reported results of the paired-samples t-test, which was conducted to determine whether there was a significant difference between the pretest and posttest scores of teacher candidates regarding their communication skills. The source reports a higher posttest mean (3.31) than pretest mean (2.75), with standard deviations of 0.167 and 0.228, respectively, and $t(29) = 3.258$. These figures require verification: the stated t value implies a two-sided p value of approximately 0.0029, and the means and stated standard deviations are not arithmetically compatible with that paired t statistic for $n = 30$. The original numerical results are retained in Table 4 rather than corrected without the paired observations. A higher posttest mean is described as a pretest–posttest association, not proof of a causal effect.

Table 4: Source-Reported Paired Comparison of Communication Skills

Measurement	N	Mean	Reported SD (SS)	df	t	Reported p
Pretest	30	2.75	0.228	29	3.258	0.01
Posttest	30	3.31	0.167	—	—	—

Note. Values are transcribed from the source; see the accompanying discussion and audit for the inconsistency between means, SDs and the t test.

As part of the study, after analyzing the results of the communication skills scale administered to teacher candidates, the results of the problem-solving skills scale test—also administered to these candidates—were examined. First, a normality test was conducted to determine whether the pretest and posttest scores of the teacher candidates on the problem-solving skills scale met the assumption of a normal distribution. The reported normality test results are presented in Table 5.

Table 5 reports the normality tests applied separately to pretest and posttest scores for problem-solving skills. Because these are marginal tests, they do not by themselves establish normality of the paired difference scores. Since the study group size was less than 50 (N=30), the Shapiro-Wilk test was used to assess the data's conformity to a normal distribution [33]. As a result of the analyses, it was found that the Shapiro-Wilk test result for the pretest scores of the teacher candidates' problem-solving skills was statistically insignificant (p = .437 > .05).

Table 5: Shapiro–Wilk Tests and Distributional Statistics for Problem-Solving Skills

Measurement	N	Shapiro–Wilk W	df	p	Skewness	Kurtosis
Pretest	30	0.966	30	0.437	0.555	1.489
Posttest	30	0.966	30	0.430	0.313	0.446

The skewness value for the pretest scores was calculated as 0.555 and the kurtosis value as 1.489; since these values fall within the range of ± 1.5 [34] or ± 2.0 [35], it was concluded that the pretest scores followed a normal distribution. Similarly, the results of the Shapiro-Wilk test for the posttest scores on problem-solving skills were also found to be statistically insignificant (p = 0.430 > 0.05). The skewness and kurtosis values for the t-test scores were calculated as 0.313 and 0.446, respectively. Since these values fell within the specified reference ranges, it was confirmed that the t-test distribution satisfied the assumption of normality. These results concern the separate marginal score distributions; confirmation of the paired-samples t-test assumption requires assessment of the within-person difference scores and should be added from the original data. The original paired-comparison results are presented in Table 6.

Table 6: Source-Reported Paired Comparison of Problem-Solving Skills

Measurement	N	Mean	Reported SD (SS)	df	t	Reported p
Pretest	30	2.20	0.188	29	2.40	0.023
Posttest	30	2.33	0.376	—	—	—

Table 6 presents the results of the paired t-test conducted to determine whether there was a statistically significant difference between the pretest and posttest scores of teacher

candidates' problem-solving skills. According to the analysis results, a statistically significant difference was found between the pretest mean scores (X = 2.20, SS = 0.188) and the posttest mean scores (X = 2.33, SS = 0.376) of the teacher candidates, t(29) = 2.40, p < 0.05. This finding indicates that there was a statistically significant increase in the teacher candidates' problem-solving scores between the two measurement periods.

IV. Discussion and Conclusion

In this study, the two dependent variables "communication skills" and "problem-solving skills"—which are of critical importance in pre-service teachers' professional lives and personal development—were examined. The effectiveness of the training/practical application process conducted was assessed through the reported parametric analyses of the pretest and posttest data. The reported data describe positive changes in mean scores across both outcomes and nominally significant paired comparisons. Nevertheless, these results should not be interpreted as demonstrating an intervention-specific causal effect, because the study lacks a control group and the communication results contain an unresolved internal statistical inconsistency.

Similarly, in their study, Koç, Terzi, and Gül [36] analyzed the relationship between university students' communication skills and their interpersonal problem-solving skills. They found that communication skills differed by gender and that women's average communication skill scores were higher than those of men. They concluded that interpersonal problem-solving scores did not show a significant difference based on whether participants had experienced domestic violence. They found that the average communication skills scores of participants who reported not having experienced domestic violence were higher than those of participants who reported having experienced domestic violence. They noted that there was no significant difference between age and the average scores for interpersonal problem-solving skills and communication skills.

When the pretest and posttest scores for teacher candidates' communication skills—which constituted the first main focus of the study—were analyzed, it was observed that the mean scores rose from X = 2.75 (SD = 0.228) to X = 3.31 (SD = 0.167) on the posttest. The t-value (t(29) = 3.258) obtained from the paired t-test, which tested the significance of the difference between these two measurements, demonstrates that the change is statistically highly significant at the p < .05 level. The reported test statistic is consistent with a positive paired difference, but it cannot on its own demonstrate a radical transformation of professional communication or prove that the course caused the change. Moreover, the displayed standard deviations and test statistic must first be reconciled with the paired observations. Teaching involves conveying messages, interpreting meaning, and managing classroom interactions. Within the reported educational programme, the following communication skills received particular emphasis:

Proper encoding and decoding of messages,

Strengthening the tendency toward empathetic listening,

Adopting constructive and reassuring language patterns instead of defensive communication,

The importance of nonverbal communication (body language, eye contact, use of space) in classroom management,

These components offered practice opportunities, although the available scores do not isolate the independent contribution of any single activity or document how quickly specific individual shortcomings were resolved.

The fact that the scores, which were lower in the pretest phase, both increased in the posttest and the standard deviation decreased (from 0.228 to 0.167) indicates that the group showed homogeneous development and that the drama classes achieved a similar standard of success among all participants in the group. This pattern may be compatible with the benefits of experiential learning, but the narrower posttest score dispersion alone does not establish uniformly positive individual change or provide direct evidence of causal effectiveness.

Similarly, Dilekman, Başcı, and Bektaş [37] conducted a study analyzing the communication skills of education faculty students. In the study, they analyzed the communication skills of education faculty students in terms of the variables of gender, grade level, and department. The researchers found no significant difference in the participants' communication skills based on gender or grade level. However, they did find a significant difference in the participants' communication skills across departments. This difference was observed among students in the elementary education, science education, psychological counseling and guidance, and elementary mathematics departments. The researchers determined that the difference favored students in the elementary education, science education, psychological counseling and guidance departments.

Another study is a review of teachers' communication skills conducted by Yıldız, Karaca, and Bakırcı [38]. This study identified relationships between teachers' communication skills and their gender, subject area, years of experience, type of school from which they graduated, graduation status, and students' grade levels. They concluded that gender, subject area, type of school attended, graduation status, and students' grade levels had no effect on teachers' communication skills. They found that teachers with less experience had better communication skills than those with more experience. Based on the qualitative findings obtained to support the quantitative findings, three subthemes—"feeling valued," "being understood," and "supporting development"—were identified under the main theme of "effective communication."

The second dimension of the study focused on the problem-solving skills of teacher candidates; it was found that the mean pretest score was X = 2.20 (SD = .188), while this value increased to X = 2.33 (SD = .376) on the posttest. The reported paired-samples comparison yielded $t(29) = 2.40$, $p = 0.023$, indicating a statistically significant difference between measurements at the stated threshold. This observation is compatible with improvement during the course, although the self-report data do not directly show how partic-

ipants solved authentic, complex classroom problems or exclude other explanations for change. Considering the student-centered crises, parental resistance, or pedagogical dilemmas a teacher candidate will face in their professional life, it is highly valuable for them to have acquired the ability to generate systematic solutions—rather than running away or reacting impulsively—even before beginning their career. However, a striking asymmetry also becomes apparent upon examining the data: Despite the massive and sharp increase in communication skills, the growth in problem-solving skills—while statistically significant—remains more modest and limited (at a moderate level). This situation can be explained by the following structural differences in the nature of the two skills:

Communication skills (active listening, making eye contact, choosing the right words, etc.) are flexible skills that can be quickly imitated, observed, and translated into behavior in the short term once awareness is raised. In contrast, problem-solving is a multi-layered, high-level mental schema that requires metacognitive processes, cause-and-effect analysis, generating alternative scenarios, weighing risks, and cognitive flexibility. It is quite difficult to realistically change individuals' reflexes and ingrained problem-solving habits through short-term training, and this development tends to unfold over time. Because the participants had not yet assumed full responsibility for their own classrooms, the extent to which scenario-based learning transferred to authentic professional decision-making remains uncertain. Because they have not personally been exposed to real crises (such as a live classroom environment or actual conflicts with parents), the rate of score improvement in this area may have been more moderate compared to that in the communication dimension. The larger reported posttest standard deviation (from 0.188 to 0.376) indicates greater variation in posttest scores, if these figures are indeed standard deviations; it does not establish individual mental readiness or the cause of that variation without the paired data. When the results are evaluated from a holistic perspective, it can be said that communication skills and problem-solving ability function like two interlocking gears that feed into one another. A high-quality and healthy problem-solving process requires, first and foremost, listening carefully to the parties involved, defining the problem clearly without distorting it, and negotiating the proposed alternative solutions in a constructive manner. Communication and problem-solving may reinforce one another because careful listening, problem definition, and negotiation form part of classroom decision-making. However, the present design did not test a statistical pathway linking improvement in communication to improvement in problem-solving, so that pathway remains a plausible interpretation rather than an empirical finding.

Berkant and Eren [39] examined the problem-solving skills of elementary mathematics education students in terms of certain variables. The study included 77 elementary mathematics education students enrolled at Kahramanmaraş Sütçü İmam University. The researchers found that students from families with low monthly incomes and those whose fathers had a middle school education or lower had significantly higher perceptions of the relevant problem-solving dimensions. However, they concluded that there were no significant differences in students' perceptions of problem-solving skills based on their gender, grade level, type of high school attended, or mother's educational level. They determined that there was no significant relationship between the participants' overall grade point averages and their problem-solving skills.

In another study, Bircan and Öner [40] examined the relationship between middle school students' levels of digital game addiction and their problem-solving skills. The researchers concluded that middle school students' levels of digital game addiction fell within the low-risk group. They also found that students' levels of digital game addiction showed significant differences based on gender and whether or not students owned their own smartphone. In addition, they concluded that there was a moderate, negative, and significant relationship between students' problem-solving skills and their levels of digital game addiction, and that students' levels of digital game addiction were a significant predictor of their problem-solving skills.

Akalın and Boz [41], on the other hand, examined the effect of a creative drama education program on children's social behavior and social problem-solving skills. They conducted this study using a pretest-posttest experimental design with a control group. A total of 40 children participated in the study, with 20 in the experimental group and 20 in the control group. The researchers concluded that the creative drama education program had a statistically significant effect on the total score increase in social skills and social problem-solving skills among the children who participated in the program. In this study, which focused on communication skills and problem-solving skills—two fundamental competency areas that will directly influence pre-service teachers' future professional performance, classroom atmosphere, and crisis management capabilities—the following clear conclusions were reached based on the empirical data obtained:

Communication scores were higher after the course than before it, a pattern consistent with the potential value of educational drama for pre-service teachers. This process has maximized the candidates' awareness of both individual and group communication, transforming them into more effective sources and recipients of information. Problem-solving scores also increased in the reported analysis, although the magnitude of the change was smaller and the design does not identify the intervention as the sole cause. Further observation and direct assessment in authentic or simulated classrooms would be needed to establish whether self-reported improvements correspond to the capacity to analyse complex situations, generate viable solutions, and retain these capabilities over time.

In conclusion, the observed pretest–posttest differences suggest that interactive and experiential learning merits consideration alongside theoretical coursework in teacher preparation. Larger controlled studies, consistent instrument documentation, and independently verified analyses are required before drawing conclusions about the intervention's effective-

ness or recommending widespread replacement of existing curriculum components.

V. Recommendations

In light of the statistical findings and concrete results obtained in the study, the following recommendations have been drawn up for researchers conducting work in a similar field and for practitioners within the education system:

- The theoretical focus of courses on communication, guidance and classroom management taught in faculties of education could be reduced. Course content could be restructured to incorporate active learning methods—such as role-play, creative drama, micro-teaching and simulation-based case studies—which directly involve trainee teachers in practical activities.
- Bearing in mind that the improvement in problem-solving skills lags behind that in communication skills, workshops focusing solely on this area could be designed. Candidates should be presented with realistic simulations of situations that frequently arise in a school setting, such as 'cases of peer bullying', 'teacher-parent conflicts' and 'scenarios of classroom indiscipline'; they can be given the opportunity to practise, time and again, the steps involved in identifying the problem, gathering data, carrying out a risk analysis and selecting the most appropriate solution.
- In order to enable trainee teachers to put the theoretical and practical skills they have acquired to the test in a real school setting, the scope of 'Teaching Practice' modules could be expanded. It should not be considered sufficient for trainees merely to deliver lessons at their placement schools; they could be encouraged to play an active role in school-based guidance processes, crisis situations, departmental communication networks and parents' meetings.
- Due to methodological constraints, only pretest and posttest measurements were carried out in this study. In future studies, follow-up tests (delayed posttests) could be administered three months and six months after the completion of the training, and when the trainees have officially commenced their roles and completed their first year in the job. In this way, the extent to which the acquired skills are retained and the degree to which they can be transferred to real-world professional practice can be monitored using longitudinal designs.
- In order to gain an understanding of the background and depth of the statistical picture provided by quantitative data, qualitative dimensions may also be incorporated into subsequent research. Through the inclusion of focus group discussions, semi-structured interviews, trainee diaries and reflective essays, the internal transformations and mental turning points experienced by trainee teachers during their training can be analysed in greater depth.
- This study was conducted on a single group of 30 participants, without a control group. To enhance the external validity and generalisability of the findings, future studies could be replicated using much larger, randomised experimental designs with experimental and control groups, involving students from different universities and different disciplines.
- In future studies, the trajectories of development in pre-service teachers' communication and problem-solving skills could be examined through multifaceted models, by relating them to various personal and psychological variables such as their personality traits, levels of emotional intelligence, levels of psychological resilience or tendencies towards critical thinking.

VI. Limitations

This study has several limitations. Firstly, the single-group pretest–posttest design, which lacks a control group, limits causal inferences. Secondly, the sample consists of 30 volunteer trainee teachers from a single faculty of education, which restricts the generalisability of the findings. Thirdly, both outcomes were measured using self-report scales, and no behavioural measures were included. Finally, no delayed posttest was conducted; consequently, the durability of the observed improvements over time is unknown.

Author Contributions

All authors contributed equally to this paper. All authors have read and approved the final manuscript.

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Data Availability

The datasets used in this study are available from the corresponding author upon reasonable request.

Ethics Statement

This study was approved by the Scientific Research and Publication Ethics Committee for Social and Humanities Sciences of the Rectorate of U. University via Decision No. 2026-62 dated February 12, 2026. Participants were informed about the study and their consent was obtained. Furthermore, participants' names were kept confidential throughout all reporting processes, and ethical principles were adhered to. Each participant took part in the study on a voluntary basis.

Conflict of Interest

The authors declare no conflicts of interest.

Use of Generative Artificial Intelligence

ChatGPT and Gemini were used during manuscript preparation to assist with English-language editing, document formatting and consistency checking.

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