ISSN: 1300-915X

# IOJPE

## INTERNATIONAL ONLINE JOURNAL OF PRIMARY EDUCATION

International Online Journal Of Primary Education

Volume 13 Issue 1

Copyright © IOJPE - www.iojpe.org

# International Online Journal of Primary Education

**ISSN: 1300-915X**

## MARCH 2024

**Volume 13 – Issue 1**

Prof. Dr. Nergüz BULUT SERİN
**Editors in Chief**

Prof.Dr. Mehmet Engin DENİZ
Prof. Dr. Şule AYCAN
Prof.Dr. Oğuz SERİN
PhD. Arzu GÜNGÖR LEUSHUIS
**Editors**

Copyright © IOJPE - www.iojpe.org

Copyright © 2024 INTERNATIONAL ONLINE JOURNAL OF PRIMARY EDUCATION

All articles published in International Online Journal of Primary Education (IOJPE) are licensed under a Creative Commons Attribution 4.0 International License (CC BY).

IOJPE allows readers to read, download, copy, distribute, print, search, or link to the full texts of its articles and allow readers to use them for any other lawful purpose.

IOJPE does not charge authors an article processing fee (APF).

Published in TURKEY

Contact Address:

Prof. Dr. Nergüz BULUT SERİN
Editor in Chief
European University of Lefke
Lefke, Northern Cyprus TR-10 Mersin, Turkey, 99010

**Message from the Editor,**

I am very pleased to inform you that we have published the first issue in 2024. As an editor of International Online Journal of Primary Education (IOJPE), this issue is the success of our authors, very valuable reviewers who undertook the rigorous peer review of the manuscripts, and those of the editorial board who devoted their valuable time through the review process. In this respect, I would like to thank to all reviewers, researchers and the editorial board members. The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to International Online Journal of Primary Education (IOJPE). For any suggestions and comments on IOJPE, please do not hesitate to send me e-mail. The countries of the authors contributed to this issue (in alphabetical order): Germany, Nigeria, Thailand, and Turkey.

Prof. Dr. Nergüz BULUT SERİN

**Editor in Chief**

Copyright © IOJPE - www.iojpe.org

**Editor in Chief**
PhD. Nergüz Bulut Serin, (European University of Lefke, North Cyprus)
Orcid ID: 0000-0002-2074-3253 Scopus ID: 26656955100 Google Scholar

**Editors**
PhD. Mehmet Engin Deniz, (Yıldız Teknik University, Turkey)
Orcid Id: 0000-0002-7930-3121 Scopus ID: 660217798 Google Scholar

PhD. Oguz Serin, (European University of Lefke, North Cyprus)
Orcid Id: 0000-0003-4739-605X Scopus ID: 26656883200 Google Scholar

PhD. Arzu Güngör Leushuis, (Florida State University, United States)
Orcid Id: 0000-0001-8197-121X Scopus ID: Google Scholar

PhD. Şule Aycan, (Muğla University, Turkey)
Orcid Id: 0000-0001-8844-0438 Scopus ID: 6603100984 Google Scholar

**Linguistic Editors**
PhD. Mehmet Ali Yavuz, (Cyprus International University, North Cyprus)
Orcid Id: 0000-0002-7121-5194 Scopus ID: 57198107116 Google Scholar

PhD. Nazife Aydınoğlu, (Final International University, North Cyprus)
Orcid Id: 0000-0002-0382-7092 Scopus ID: Google Scholar

**Classroom Management in Primary Education**
PhD. Chokri Kooli, (University of Ottawa, Canada)
Orcid Id: 0000-0002-8211-8621 Scopus ID: 57210946891 Google Scholar

PhD. Fahriye Altınay, (Near East University, North Cyprus)
Orcid Id: 0000-0002-3861-6447 Scopus ID: 8350821700 Google Scholar

PhD. Mehmet Durdu Karslı, (Eastern Mediterranean University, North Cyprus)
Orcid Id: 0000-0003-1239-4150 Scopus ID: 14063443600 Google Scholar

**Curriculum Development in Primary Education**
PhD. Ali Ahmad Al-Barakat, (University of Sharjah, United Arab Emirates)
Orcid Id: 0000-0002-2709-4962 Scopus ID: 35118761200 Google Scholar

PhD. Arzu Güngör Leushuis, (Florida State University, United States)
Orcid Id: 0000-0001-8197-121X Scopus ID: Google Scholar

PhD. Asuman Seda Saracaloğlu, (Adnan Menderes University, Turkey)
Orcid Id: 0000-0001-7980-0892 Scopus ID: 26656925800 Google Scholar

Copyright © IOJPE - www.iojpe.org

**Computer Education and Instructional Technologies in Primary Education**
PhD. Aytekin İşman, (Sakarya University, Turkey)
Orcid Id: 0000-0003-0420-7976 Scopus ID: 10839357100 Google Scholar

Ph.D. Ersun İşçioğlu, (Eastern Mediterranean University, North Cyprus)
Orcid Id: 0000-0002-0637-7912 Scopus ID: 36191794000 Google Scholar

PhD. Halil İbrahim Yalın, (Cyprus International University, North Cyprus)
Orcid Id: 0000-0002-6355-7661 Scopus ID: 23096832400 Google Scholar

PhD. Sezer Kanbul, (Near East University, North Cyprus)
Orcid Id: 0000-0002-4715-8089 Scopus ID: 26658005100 Google Scholar

Ms Umut Tekgüç, (Bahçeşehir Cyprus University, North Cyprus)
Orcid Id: 0000-0001-5974-5566 Scopus ID: 35300830300 Google Scholar

PhD. Zehra Altınay, (Near East University, North Cyprus)
Orcid Id: 0000-0002-6786-6787 Scopus ID: 8350821600 Google Scholar

**Educational Drama in Primary Education**
PhD. Alev Önder, (Bahçeşehir University, Turkey)
Orcid Id: 0000-0002-2736-4600 Scopus ID: 26656903100 Google Scholar

**Educational Psychology in Primary Education**
PhD. Christina Athanasiades, (Psychology, Aristotle University of Thessaloniki, Greece)
Orcid Id: 0000-0003-4916-9328 Scopus ID: 25652700900 Google Scholar

PhD. Muhammad Sabil Farooq, (Nankai University Tianjin, P.R. China)
Orcid Id: 0000-0001-7034-0172 Scopus ID: 57205442426 Google Scholar

PhD. Rengin Karaca, (Dokuz Eylül University, Turkey)
Orcid Id: 0000-0001-5955-0603 Scopus ID: Google Scholar

PhD. Thanos Touloupis, (Aristotle University of Thessaloniki, Greece)
Orcid Id: 0000-0003-2951-6919 Scopus ID: 56441555400 Google Scholar

**Fine Arts Education in Primary Education**
PhD. Ayfer Kocabaş, (Dokuz Eylül University, Turkey)
Orcid Id: 0000-0002-5566-212X Scopus ID: 26656822800 Google Scholar

**Foreign Language Teaching in Primary Education**
PhD. Nazife Aydınoğlu, (Final International University, North Cyprus)
Orcid Id: 0000-0002-0382-7092 Scopus ID: Google Scholar

PhD. İzzettin Kök, (Girne American University, North Cyprus)
Orcid Id: 0000-0003-2229-8058 Scopus ID: 55127933400 Google Scholar

Copyright © IOJPE - www.iojpe.org

PhD. Perihan Savaş, (Middle East Technical University Turkey)
Orcid Id: 0000-0001-9839-3081 Scopus ID: 36337903400 Google Scholar

PhD. Vahid Norouzi Lasari, (Charles University, Prague, Czech Republic)
Orcid Id: 0000-0002-3359-2677 Scopus ID: 57700659200 Google Scholar

**Guidance and Counselling in Primary Education**
PhD. Ferda Aysan, (Dokuz Eylül University, Turkey)
Orcid Id: 0000-0003-1396-3183 Scopus ID: 6507300768 Google Scholar

PhD. Mehmet Engin Deniz, (Yıldız Teknik University, Turkey)
Orcid Id: 0000-0002-7930-3121 Scopus ID: 660217798 Google Scholar

PhD. Nergüz Bulut Serin, (European University of Lefke, North Cyprus)
Orcid ID: 0000-0002-2074-3253 Scopus ID: 26656955100 Google Scholar

**Mathematics Education in Primary Education**
PhD. Elizabeth Jakubowski, (Florida State University, United States)
Orcid Id: 0000-0001-5348-2400 Scopus ID: 26428775500 Google Scholar

PhD. Kakoma Luneta, (University of Johannesburg, South Africa)
Orcid Id: 0000-0001-9061-0416 Scopus ID: 55893693500 Google Scholar

PhD. Melih Turgut, (Norwegian University of Science and Technology (NTNU), Norway)
Orcid Id: 0000-0003-3777-9882 Scopus ID: 26322098600 Google Scholar

PhD. Moritz Herzog, (University of Wuppertal, Germany)
Orcid Id: 0000-0002-6706-3351 Scopus ID: 57193900500 Google Scholar

PhD. Nazan Sezen Yüksel, (Hacettepe University, Turkey)
Orcid Id: 0000-0002-0539-3785 Scopus ID: 44661914200 Google Scholar

PhD. Osman Cankoy, (Atatürk Teachers Academy, North Cyprus)
Orcid Id: 0000-0002-4765-9297 Scopus ID: 8311142800 Google Scholar

PhD. Sinan Olkun, (Final International University, North Cyprus)
Orcid Id: 0000-0003-3764-2528 Scopus ID: 8895882700 Google Scholar

PhD. Stefan Haesen, (Thomas More University, Belgium)
Orcid Id: 0000-0002-2769-9822 Scopus ID: 15519207100 Google Scholar

**Measurement and Evaluation in Primary Education**
PhD. Bayram Bıçak, (Akdeniz University, Turkey)
Orcid Id: 0000-0001-8006-4677 Scopus ID: Google Scholar

PhD. Emre Çetin, (Cyprus Social Sciences University, North Cyprus)
Orcid Id: 0000-0001-5474-6164 Scopus ID: 55616695500 Google Scholar

PhD. Gökhan İskifoğlu, (European University of Lefke, North Cyprus)
Orcid Id: 0000-0001-8119-4254 Scopus ID: 55745026100 Google Scholar

PhD. Selahattin Gelbal, (Hacettepe University, Turkey)
Orcid Id: 0000-0001-5181-7262 Scopus ID: 15519291100 Google Scholar

**Music Education in Primary Education**
PhD. Gulsen G. Erdal, (Kocaeli University, Turkey)
Orcid Id: 0000-0002-5299-126X Scopus ID: Google Scholar

PhD. Sezen Özeke, (Uludağ University, Turkey)
Orcid Id: 0000-0001-9237-674X Scopus ID: 26658548400 Google Scholar

PhD. Şirin Akbulut Demirci, (Uludağ University, Turkey)
Orcid Id: 0000-0001-8904-4920 Scopus ID: Google Scholar

**Pre-School Education**
PhD. Alev Önder, (Bahçeşehir University, Turkey)
Orcid Id: 0000-0002-2736-4600 Scopus ID: 26656903100 Google Scholar

PhD. Ilfa Zhulamanova, (University of Soutnern Indiana, United States)
Orcid Id: 0000-0003-3333-4237 Scopus ID: 57191155432 Google Scholar

PhD. Ithel Jones, (Florida State University, United States)
Orcid Id: 0000-0002-0690-3070 Scopus ID: 8696931600 Google Scholar

PhD. Rengin Zembat, (Maltepe University, Turkey)
Orcid Id: 0000-0002-2377-8910 Scopus ID: 35955365300 Google Scholar

**Science Education in Primary Education**
PhD. Oguz Serin, (European University of Lefke, North Cyprus)
Orcid Id: 0000-0003-4739-605X Scopus ID: 26656883200 Google Scholar

PhD. Salih Çepni, (Uludağ University, Turkey)
Orcid Id: 0000-0003-2343-8796 Scopus ID: 16642100700 Google Scholar

PhD. Şule Aycan, (Muğla University, Turkey)
Orcid Id: 0000-0001-8844-0438 Scopus ID: 6603100984 Google Scholar

PhD. Woldie Belachew Balea, (Addis Ababa University, Ethiopia)
Orcid Id: 0000-0002-7891-4385 Scopus ID: 57218449004 Google Scholar

Copyright © IOJPE - www.iojpe.org

**Social Sciences Education in Primary Education**
PhD. Erdal Aslan, (Dokuz Eylül University, Turkey)
Orcid Id: 0000-0002-9267-9852 Scopus ID: 56010448700 Google Scholar

PhD. Z. Nurdan Baysal, (Marmara University, Turkey)
Orcid Id: 0000-0002-3548-1217 Scopus ID: 36543669300 Google Scholar

**Sports Education in Primary Education**
PhD. Erkut Konter, (Dokuz Eylül University, Turkey)
Orcid Id: 0000-0003-1664-9077 Scopus ID: 28167487300 Google Scholar

PhD. Metin Dalip, (State University of Tetova, Macedonia)
Orcid Id: 0000-0002-7142-8931 Scopus ID: Google Scholar

PhD. Rana Varol, (Ege University, Turkey)
Orcid Id: 0000-0002-9196-984X Scopus ID: 57189325705 Google Scholar

**Special Education in Primary Education**
PhD. Hakan Sarı, (Necmettin Erbakan University, Turkey)
Orcid Id: 0000-0003-4528-8936 Scopus ID: 8043728500 Google Scholar

PhD. Hasan Avcıoğlu, (Cyprus International University, North Cyprus)
Orcid Id: 0000-0002-3464-2285 Scopus ID: 54974732100 Google Scholar

PhD. Muhammad Zaheer Asghar, (Universitat Oberta de Catalunya, Barcelona, Spain)
Orcid Id: 0000-0003-2634-0583 Scopus ID: 57208667494 Google Scholar

PhD. Tevhide Kargın, (Hasan Kalyoncu University, Turkey)
Orcid Id: 0000-0002-1243-8486 Scopus ID: 7801652354 Google Scholar

**Turkish Language Teaching in Primary Education**
PhD. Ahmet Pehlivan, (Eastern Mediterranean University, North Cyprus)
Orcid Id: 0000-0002-5987-6475 Scopus ID: 36456968000 Google Scholar

PhD. Yüksel Girgin, (Adnan Menderes University, Turkey)
Orcid Id: 0000-0002-0515-6077 Scopus ID: Google Scholar

**Journal Cover Designer**
Eser Yıldızlar, (University of Sunderland, England)

**ISSN:** 1300-915X

Copyright © IOJPE - www.iojpe.org

Volume 13, Issue 1 (2024)

**Table of Contents**

Research Articles



**ISSN**: 1300-915X

Copyright © IOJPE - www.iojpe.org

IOJPE

ISSN: 1300 – 915X
www.iojpe.org

*International Online Journal of Primary Education* *2024, volume 13, issue 1*

# TEACHER TECH-CREATIVITY FOSTERING BEHAVIOUR AS DETERMINANT OF PRIMARY SCHOOL MATHEMATICS TEACHER CLASSROOM PRACTICES

Martha Mimi CHIANSON-AKAA
Senior Lecturer, Department of Science and Mathematics Education, Benue State University, Makurdi, Nigeria
ORCID: https://orcid.org/0000-0003-0704-6346
searchhbk@yahoo.com

Emmanuel Edoja ACHOR
Prof.Dr., Department of Science and Mathematics Education, Benue State University, Makurdi, Nigeria
ORCID: https://orcid.org/0000-0002-6272-0877
nuelachor@yahoo.com

Benjamin ROTT
Prof.Dr., Institute of Mathematics Education, University of Cologne, Germany
ORCID: https://orcid.org/0000-0002-8113-1584
benjamin.rott@uni-koeln.de

**Received:** November 20, 2023 **Accepted:** March 08, 2024 **Published:** March 31, 2024

**Suggested Citation:**
Chianson-Akaa, M. M., Achor, E. E., & Rott, B. (2024). Teacher tech-creativity fostering behaviour as determinant of primary school mathematics teacher classroom practices. *International Online Journal of Primary Education (IOJPE), 13*(1), 1-22 https://doi.org/10.55020/iojpe.1392996

This is an open access article under the CC BY 4.0 license.

**Abstract**

This research investigated teacher technological-creative fostering behaviour as determinant of teacher classroom practices in private primary schools in the Makurdi Local Government Area, Benue State, Nigeria. This study adopted the correlational research design. The population was all teachers in private primary schools in Makurdi. A sample of 70 mathematics teachers was drawn from 50 private primary schools. Two researcher-structured instruments were used for data collection, namely; the Mathematics Teacher Tech-Creativity Inventory (MTTI) and the Mathematics Teacher Classroom Practice Inventory (MTCPI). Correlation, scatterplots, and histograms were used to answer research questions, while analysis of variance was used to test the hypotheses at .05 level of significance. The following were the findings: the top three technological tools among others which mathematics teachers at the primary school level use most often to facilitate their teaching practices are, first interactive whiteboard, second, the calculator and third, internet surfing. Teacher tech-creativity fostering behaviour has a significant impact on teacher clarity, teacher classroom discussions, teacher feedback, teacher formative assessment and, teacher-teacher collaboration as teacher classroom practices. It was recommended that teachers of mathematics consider utilizing technology creatively during lessons as a catalyst to advance classroom teaching practices of teacher classroom clarity, class discussions, teacher feedback, formative assessment, and teacher-teacher collaboration.

**Keywords:** Tech-creativity, teacher clarity, teacher feedback, teacher formative assessment, teacher-teacher collaboration.

## INTRODUCTION

With its innovations and advantages for producing and exchanging ideas and content, new technologies have quickly changed the way that teaching and learning are done. Therefore, it is important to think about the advancement and impact of learning technology in conjunction with chances for creative education rather than in isolation. Technology is used to distribute, interact with, or promote information. It encompasses electronic teaching (e-teaching) and electronic learning (e-learning). Increased access to teaching-learning possibilities, time and place convenience, a wider range of teaching and learning resources available, enhanced opportunities for individual learning, and the development of more cognitive tools are all benefits of e-teaching and e-learning (Ugwuogo, 2011).

Comparably, digital technology fosters connections, enriches student experiences, simulates scenarios, encourages collaboration, and generates engaging learning settings (UNESCO, 2023). In technologically advanced settings, teachers can employ digital tools and technologies to foster students' creative thinking (Henriksen, Mishra, & Fisser, 2016; Yalcinalp & Avci, 2019). By using technology in teaching and learning, educators can provide students with hands-on learning opportunities that sustain their interest in a subject without diverting focus from it (Haleem, Javaid, Qadri, & Suman, 2022). By assigning assignments that use technologically-based resources like computers, projectors, and other state-of-the-art technological tools, teachers can make their students' learning more dynamic and engaging. This could make their classes incredibly fascinating and interesting for the students (Lopez-Fernandez, 2021).

Teachers of mathematics may at some point face challenges while trying to plan lessons on difficult mathematics concepts, solve difficult mathematics problems, or try to incorporate techniques to make mathematics teaching-learning processes simplistic and modify their teaching practices. If this becomes a dilemma, blending technology and teacher creativity may more or less become essential to benefit the teaching-learning process. The innovativeness and ingenuity that comes with creative thinking and technology in the classroom strengthen and thicken the teacher's expertise and favors excellence in the teaching profession.

**Theoretical background of the research**

Generally in this work, the theoretical underpins of tech-creativity and teacher classroom practices are borne from the premises of models such as the technological pedagogical content knowledge (TPACK) model (Mishra & Koehler, 2006), Substitution, Augmentation, Modification, Redefinition (SAMR) model (Puentedura, 2006), feedback model (Hattie & Timperley, 2007), and on theories of socio-constructivist theory by Vygotsky (1978), formative assessment theory (Black & Williams, 1998) and the cognitive load theory (Sweller, 1988).

The TPACK model is a framework developed to address the complex interplay of technological knowledge, pedagogical knowledge, and content knowledge required for effective teaching with technology (Mishra & Koehler, 2006). The model has helped educators to integrate technology into their teaching practices. Consequently, the SAMR model was designed to help educators integrate technology into teaching and learning (Puentedura, 2006). Also, the feedback model was developed to emphasize the importance of feedback in enhancing students' learning and teacher instructions (Hattie & Timperley, 2007).

The theory of socio-constructivism emphasizes that knowledge is actively constructed or developed through social interactions and collaborations with others, which fosters a learning environment where joint activities, discussions, and problem-solving tasks are emphasized (Vygotsky, 1978). Also, the cognitive load theory is an educational theory that focuses on the mental effort involved in learning, and how the cognitive resources of learners are assigned, and it proposes strategies to manage cognitive load effectively for maximum learning outcomes to be achieved (Sweller, 1988). Furthermore, the theory of formative assessment highlights the importance of ongoing classroom-based assessments to enhance students' learning. The theory emphasizes the pivotal role of feedback, questioning, and self-assessment in formative assessment practices, thus promoting the idea that if such methods are employed, teaching, and learning outcomes will be improved (Black & Williams, 1998).

These aforementioned models and theories form the basis for which classroom practices of teacher clarity, class discussions, teacher feedback, formative assessment, and teacher-teacher collaboration are intertwined with teacher tech-creativity to revolutionize the classroom scenario. Teacher clarity is an essential element of effective teaching (Brckalorenz, Cole, Kinzie, & Ribera (2012). Teacher clarity draws on the sync of cognitive load theory and technology integration models such as the SAMR. Teacher clarity is aligned with the extraneous cognitive load which exposes that where additional mental effort imposed by instructional design or presentation of information is poorly designed or where unclear instruction is given, this can contribute to extraneous load (Benton & Li, 2021). With technology

integration, the teacher can modify and redesign tasks to enhance new possibilities and capabilities. Therefore, the interface between tech-creativity and teacher clarity involves the teacher utilizing technology creatively to redesign and modify learning experiences to enhance clarity in conveying information, fostering engagement, and providing meaningful learning experiences.

The theoretical framework for tech-creativity and class discussion incorporates Vygotsky's theory of socio-constructivism which highlights the importance of social interaction and collaborative learning. In this framework, teachers are encouraged to use technology to augment students' interactions and discussions in class. This can be done by employing online platforms, discussion forums, or using collaborative tools to extend class discourse beyond conventional classroom boundaries. The TPACK may be significant in emphasizing the interaction of technological skills, pedagogical knowledge, and subject matter expertise. Incorporating technology creatively can enhance the quality of active participation, class discussions, critical thinking, and meaningful dialogue among students (Sharma, 2023; Eiland & Todd, 2019).

Consequently, the theoretical framework of tech-creativity and teacher feedback is founded on the TPACK model, cognitive load theory, and feedback model. It underpins the importance of using technology creatively to facilitate effective feedback mechanisms in the learning process (Deeley, 2018). The framework explores how tools and platforms can be employed to provide timely and personalized feedback. Cognitive load theory guides the design of technology-enhanced feedback that aligns with students' cognitive capacities while promoting comprehension and retention. The theory of cognitive load contends that learning is prevented when the brain experiences cognitive overload. By enabling pupils to concentrate on the intended instruction, technology can help lessen cognitive overload. Students can use the time saved to study, practice, and get feedback on materials they have learned. In all, the framework encourages teachers should creatively integrate technology in class to improve the quality and efficiency of feedback which can foster students' learning and teacher instructions.

In the same vein, tech-creativity and formative assessment incorporate technological tools and formative assessment theories. It emphasizes the integration of technology to enhance the formative assessment process, which involves gathering information during instruction to inform teaching and improve learning (Deeley, 2018). The framework encourages teachers to employ a variety of tech-based formative assessment strategies such as quizzes, interactive simulation, and instructional feedback tools to tailor instructions and support students' learning. Finally, tech-creativity and teacher-teacher collaboration are founded on socio-constructivist theory of Vygotsky and the technology integration model such as TPACK. Given that Vygotsky's theory places a strong emphasis on social contact and teamwork in the learning process, the framework for teacher-teacher collaboration encourages educators to use technology in innovative ways to promote communication, resource/material sharing, and cooperative lesson planning (Cicconi, 2013). Teachers may interact electronically, discuss creative teaching techniques, and participate in continuous professional development using technology.

**Literature review**

In this paper pertinent concepts like teacher creativity, technology conceptualization, tech-creativity, and teacher classroom practice are explained for better understanding.

The collection of abilities known as *creativity* is what makes ideas clever, worthwhile, and concise. The ability to effect change and transition from one outdated paradigm to a more modern one while achieving learning objectives is a component of teacher creativity, a word that is frequently used both within and outside of the classroom (Darma, Notosudjono, & Herfina, 2021). To help students develop a variety of skills, including social, emotional, and cognitive skills, teachers must be creative in their approach to teaching. This involves using innovative approaches and responding nimbly to novel situations. Ultimately, this helps make learning more engaging and effective (Lapeniene & Dumciene, 2014; Rankin & Brown, 2016).

In most conceptualizations, teacher creativity also encompasses teaching for creativity, that is enabling students to become creative themselves (Lapeniene & Dumciene, 2014). For something to be the product

of a creative process, it is not enough for it to be novel, it must have value or be appropriate to the cognitive demands of the situation. A creative mind is an innovative mind prepared to bring about solutions to identified challenges or hitches faced when such challenges are identified. (Gyuse, Achor, & Chianson, 2014).

The imaginable cannot suppress creativity because it can generate ideas and solutions that transcend both reason and the conceivable. Ideas that are qualitatively distinct and not tangibly attributable to any one preceding notion can be produced by creativity (Rott & Liljedahl, 2018).

Agogo (2018) avers that the ultimate aim of creativity is the production of responses, ideas or products that are novel, original, and uncommon. In the same vein, Ortese, Yawe, and Akume (2014) define creativity in a different way, which is the ability to see problems in a new way and the ability to escape the bonds of conventional thinking. Creativity is a cognitive activity that is based on human thinking which leads to new, original, and useful ideas and products. By implication, creativity celebrates ingenuity and hard work that yields positive results. This has become so relevant now that Benjamin Bloom and his students (Anderson, Krathwohl, & Bloom, 2001) have modified Bloom's taxonomy of educational objectives; in an earlier version, evaluation was placed as the higher-level of thinking but it has now been replaced with creating as the highest-level of thinking (Achor, 2020). This makes it evident that creativity is a fundamental skill necessary for knowledge formation.

Numerous factors can impact a teacher's creativity, such as their prior work experience in the classroom, their history of interacting with students, the use of various learning environments, tools, and techniques, and their ability to collaborate with other educators and school administrators (Oroujlou & Vahedi, 2011; Blazar & Kraft, 2017). By creating and implementing innovative teaching methods, mediating—using their expertise to interpret and seek support on various improvement plans—and cultivating strong bonds with other educators, teachers can bring creativity into the classroom and support learning by helping students grow and change through the reciprocity of the teaching-learning process. When teaching methods incorporate creativity, the classroom becomes more of a breeding ground for creative and effective instruction. Imagination flourishes when it is encouraged. Creativity displayed by a teacher depicts a person's competence as an ideal teacher. Teaching with creative expressions, guiding students with creative approaches and methods, and as well giving students opportunities through instructions to develop their ideas that can break impending barriers and achieve ideas due to thinking 'out of the box', serves as a positive pathway to enhancing class lesson productivity and students' knowledge.

*Technology* is the practical application of knowledge so that something entirely new can be done, or so that something can be done in a completely new way (European Space Agency, 2023). This implies that technology can afford teachers of mathematics the opportunity to revamp their knowledge, skills, and teaching practices when the need arises. Technology has been integrated into some traditional teaching methods and class instructions to foster more engaging and exciting learning experiences. For instance, students now enjoy e-scaffolding, e-simulation, and more. Technology integration is the effective implementation of educational technology to accomplish intended learning outcomes (Achor, 2022). Teachers of mathematics now have a myriad of options via technology at their disposal to select, tryout, and approve the appropriate instructional methods and strategies to utilize in class, which may help to improve their teaching.

The term *tech-creativity* is a derivation from technological creativity. According to Sierotowicz (2015) technological creativity is highly fostered in "knowledge-creating" organizations for innovation of new products, new processes, and services. Creativity can be viewed as the ability to bring in new ideas, while technology encapsulates useful innovations. Hence, tech-creativity can be defined as the ability to come up with new ideas whose consequence is the development of useful innovations. Tech-creativity can be seen as using novel idea-driven applications from the exploitation of creative inventions or innovations in pursuit of solving societal and classroom problems (Rambe, Ndofirepi, & Dzansi, 2016). Technology use in the classroom is exceptional then when blended with creativity, lessons become enriched. Enriched in the sense that in the classroom, technological impact has increased interactivity

and class engagement. It can foster better overall comprehension, practical learning, time management, and combined learning methodologies (Bay Atlantic University, 2022).

The greatest applications of educational technology, according to Mishra, Koehler, and Henriksen (2011), must be based on innovative mindsets that value taking intellectual risks and being open to new ideas. Any teacher, but especially novice instructors, has a great struggle with this. Technology has altered the way educators find material to use in their classes, organize it, and incorporate it. This may affect their methods of instruction, raising the bar for professionalism. Teachers must make decisions about what and when to use digital technology in their lessons more frequently as a result of the expanding role and availability of this technology in society (Gonscherowski & Rott, 2022). Most likely, this is an attempt to make lessons more interesting and captivating.

The rapidly evolving landscape of teaching and learning necessitates that educators become more adaptive and take a creative approach to the digitally advanced classroom. Teachers must thus stay up to date on the use of technology and creativity in the classroom; nonetheless, the effectiveness of their efforts depends on how they represent tech-creativity. Teachers of mathematics who are technologically creative should be able to assess themselves based on a few of the following statements but not restrictively: 'I enjoy trying out new mathematical ideas using technologically-driven tools in class,' 'I am willing to try any new technology supported method even if there is a chance it could fail,' 'I love to modify and adapt mathematics lesson routines in line with new technology', 'I am continually looking for new technology-driven ideas to make the teaching of mathematics easier', 'Once I have developed a technology supported plan, I am prepared to use it during mathematics lessons', and lastly 'I continuously look at old problems with a fresh mindset guided by latest technology developments during mathematics lessons'. The aforementioned development may tend to force teachers to independently decide and construct their reality within the context of their personal and work environment. It is in the process of personal learning and development that teacher creativity using technology becomes a necessary means to evolve teacher classroom practices and thereby imparting knowledge to the students.

*Teacher classroom practices* range from designing learning experiences for the students, selecting instructional materials, developing lesson objectives, presentation of the lesson, and managing students' behaviours (Cornelius-Ukpepi & Aglazor, 2019). For this work, some suggested highly effective teaching practices by Alber (2015) were investigated for effective teaching of Mathematics in this study. Understanding how teachers use classroom instruction to engage students, how they adapt their teaching and interaction strategies, how confident they are in communicating expectations to students, whether or not they use classroom discussion as a learning tool, and how well their formative assessment and feedback strategies are enhancing the learning environment are all crucial to improving the mathematical achievement culture of teachers.

Alber (2015) further identified certain variables that are encapsulated in classroom teaching practices which may likely be enhanced via teacher tech-creativity, the variables selected are: 1) teacher clarity; 2) classroom discussion; 3) feedback; 4) formative assessment; 5) teacher-teacher collaboration.

Though these practices are recurring teacher events in the classroom, their viability will necessarily depend on how the teacher can reinforce novel ideas to keep them enlightening. The novelty in idea formation here brings about creativity. These variables are discussed based on their possible relatedness to teacher creativity.

The idea of "clear teaching behavior," which, according to Hattie (2012), outlines the abilities, information, attitudes, and values that students must acquire, is crucial to the idea of teacher clarity. When a teacher introduces a new subject to the class, it is best to explain the purpose and learning objectives. Then, the teacher can use creative and explicit visual aids to help students understand difficult concepts, and online resources like interactive whiteboards, educational apps, and video tutorials can help students learn more engagingly. Connecting and sharing resources via social media platforms facilitates learning about the most effective teaching methods for pupils. For pupils to see what the finished result looks like, it is best to additionally show them models or examples.

Classroom discussion can help students acquire better communication skills, as they learn to present ideas clearly and briefly; it also provides opportunities to practice listening skills and follow what others are saying (Cashin, 2011; Kosko, 2012). Teachers need to frequently initiate and facilitate entire class discussions with the view of allowing students to learn from each other. It is also a great opportunity for teachers to formatively assess (through observation) how well students comprehend the new content and concepts. Teachers can creatively foster class discussions by using open-ended questions that allow students to think critically, and develop new ideas and opinions. Incorporate multimedia to spark discussions and help students visualize concepts and ideas that will cause discussions to be more interactive. Teachers can use reflective questions and give students room to process, and engage students in discussions that can help them express themselves creatively.

Consistent feedback gives students a better understanding of their progress. Teachers should give whole-group feedback on areas of need and patterns they observe in the growth of the classes as a whole in addition to written or verbal input to individuals. For the teacher to modify the teaching strategy, resources, and guidelines as necessary, students must also be given the chance to offer feedback (Zhang & Zheng, 2018). According to Jimin, Chianson-Akaa, and Amua (2023), one environmental element that affects students' self-efficacy is the feedback they receive from their teachers. Feedback has the potential to steer classroom conversations. Teachers who are providing innovative feedback can also urge students to reflect on their work and identify areas that require improvement. This approach empowers students to take responsibility for their learning. Using peer feedback is another way of creatively giving out feedback, students should be allowed to provide feedback to their peers which will help them develop critical thinking skills and further improve communication. Using technology such as online quizzes, surveys, or interactive whiteboards, is another way to make feedback creative and more engaging. Using visual aids such as graphs, charts or diagrams helps students to track and understand their progress better, then identify areas they need improvement.

Formative assessment is described as a process in which students participate in the process through self-assessment, teachers adapt their instruction based on assessment evidence, and students receive feedback on their learning and suggestions for improvement (Black & Wiliam, 2009). Teachers must regularly and often evaluate their student's progress toward the topic's learning objectives or final result to give them insightful and correct feedback (summative evaluation). Students will find formative assessment enjoyable and less threatening if teachers use creative approaches such as: requesting students to mention subjects or topics they find hard to understand and then providing a specific worksheet or journal to students to express their thoughts. Asking class representatives to evaluate the performances of their classmates. Asking students to self-evaluate their learning growth and performances. Teachers can try to be creative in giving formative assessment by asking students to write a letter to a family member or friend on a sheet of paper or index card, explaining to them a new concept they have learned.

A strong collaborative culture among teachers is one element that is widely accepted to support improvements in classroom and school environments. According to Richter and Pant (2016) and Kolleck, Schuster, Hartmann, and Grasel (2021), teachers are expected to work in teacher teams, collaborate closely with colleagues, and co-construct classroom methods to build trust connections within the team. Although it does not appear frequent, teacher collaboration has a lot to offer those who participate. In addition to providing instructors with the chance to exchange sound ideas and dispel misconceptions based on newly acquired knowledge, teacher collaboration with colleagues is crucial for the development of a professional community. Teaching can be exhausting and emotionally draining. Teachers face stress in their profession, whether it is from managing a particularly difficult student or juggling work and home life (or both). Fortunately, their colleagues may offer assistance during stressful times.

Teachers who rely on one another for help, can build relationships based on empathy and trust. Establishing enduring professional and mentoring ties requires these frequent encounters. Supported teachers are more likely to give their students the same support (Arkansas State University, 2020). When

educators learn to work together electronically in real-time or offline to discuss issues, advancements, and new advances, they can collaborate creatively. Teachers can also form collaboration teams and build productive relationships that can rid them of archaic and mundane approaches, skills, and practices. Another creative way to handle teacher-teacher collaboration is by encouraging peer observations; teachers can learn from each other when they observe each other teach and also provide feedback on what they have observed. Yet another creative way of handling teacher-teacher collaboration is by introducing professional learning communities; these are groups of educationists who meet regularly to discuss teaching practices, students' learning, and other topics related to education. Some research works focused on creativity and technology used to enhance teacher's performance or students' learning. For instance, the findings of Fitriah (2018) revealed that teachers are aware of the importance of technology in creativity. Technology appears to help them explore their creativity and encourages learners' creativity as well such that it helps transfer their creativity into reality, making the activities more authentic, and provides teaching materials on various topics. Similarly, Mgboro, Otuba, and Uda (2019) looked into how to use digital technology to increase teacher creativity and discovered that the social environment in which teachers work, external institutional forces, and internal creative personality traits all contribute to increased teacher creativity. In other words, using digital technology in secondary school instruction enables instructors to participate in the learning process. However, the sustainability of this type of teacher involvement depends on the presence of creative personality qualities and an environment that fosters creativity. Additionally, research by Li, Kim, and Palker (2022) showed that new technologies efficiently foster students' creativity, especially in interactive learning environments.

Mathematics teachers can construct everyday creativity through the implementation of technology to improve their teaching practices. Technology does not provide ideas; technology can complement skills by providing a means of experimentation and exploration (Carlile & Jordan, 2012). Teachers who have not equipped and improved their tech-creativity skills may not be apt with the required and essential teaching practices, this can further hamper students' performance in mathematics.

Technology and creativity complement each other because technology applies practical ideas for the emergence of something new. For a new thing, idea, concept, or method to be initiated and actualized, creative thinking must be involved. Hence, teachers of mathematics must consider harmonizing technology and creativity in the teaching and learning process. Teacher classroom practices are teaching culture operations in which teachers need to steer teaching and learning procedures in the classroom. Teachers of mathematics may necessarily need to upgrade, alternate, and sometimes vary the approaches they employ while delivering classroom practices. It is possible to go about this action fervently if teachers are abreast with recent relevant technological applications blended with creative thinking to enhance the smooth sailing of the teaching-learning process. Technological facilities provide the opening for teachers to select from numerous options what technological innovations are suitable for use to advance their teacher classroom practices and keep teachers well-informed about innovations in classroom practices. The essence of being tech-savvy for knowledge growth and the development of professional skills cannot be over-emphasized. This knowledge becomes eminent and necessary to sustain the teachers' quest and zeal to enhance professional development and as well make their classroom practices prosper.

**Statement of the problem**

Mathematics teachers may need to re-evaluate how they present their teaching instructions to erase doubts or fears of futile or unworkable classroom practices. Teachers may need to see if infusing creativity into lesson delivery can foster teaching practices. Teachers may also be worried if the way knowledge is transferred from teacher to student is adequate or appreciable. Teachers worry if students comprehend what they teach and how they go about the teaching, which is especially true for beginning teachers of mathematics. Mathematics teachers worry about these issues and more because of the existing poor students' performance in mathematics, which may likely be attributed to how teachers impart knowledge during the teaching-learning process. The growing ambivalence in the minds of

mathematics teachers due to thoughts of their underperformance and students' poor performance has caused teachers to lose their courage and relegate their classroom teaching practices.
Mathematics teachers may gloss over classroom teaching practices, considering them superficial. The truth is that these practices make or break the teaching and learning scenario in the classroom. Without acquiring the ethics of classroom teaching practices, teachers are half-baked and cannot be recognized as fit for the responsibility of teaching. Some teachers may have adopted the right practices, but without infusing technology and creativity into their teaching, which may have crippled the ingenuity, ferventness, and effectiveness of their teaching. With technological advancement which has exploded and gained ground in our school and classroom systems, it is unfair and illogical for teachers to imbibe teaching practices without blending them with tech-creativity. Teachers may need to try tech-creativity to see if it can foster their classroom teaching practices to redeem their lost courage and teaching expertise. This justifies the worry for this study.

**Research questions**

The following research questions (a derivative of Alber's criteria) were answered in this study:

1. What types of technological tools are available for use to enhance teacher classroom practice?
2. To what extent does teacher tech-creativity foster behaviour affect teacher clarity in class as a teacher classroom practice?
3. To what extent does teacher tech-creativity foster behaviour affect teacher class discussions as a teacher classroom practice?
4. To what extent does teacher tech-creativity foster behaviour affect teacher feedback as a teacher classroom practice?
5. To what extent does teacher tech-creativity foster behaviour affect teacher formative assessment as a teacher classroom practice?
6. To what extent does teacher tech-creativity foster behaviour affect teacher-teacher collaboration as a teacher classroom practice?

**Hypotheses**

The following hypotheses were tested at .05 level of significance:

Ho1: Teacher tech-creativity fostering behaviour has no significant impact on teacher clarity as a teacher classroom practice.
Ho2: Teacher tech-creativity fostering behaviour has no significant impact on teacher classroom discussion as a teacher classroom practice.
Ho3: Teacher tech-creativity fostering behaviour has no significant impact on teacher feedback as a teacher classroom practice.
Ho4: Teacher tech-creativity fostering behaviour has no significant impact on teacher formative assessment as a teacher classroom practice.
Ho5: Teacher tech-creativity fostering behaviour has no significant impact on teacher-teacher collaboration as a teacher classroom practice.

## METHOD

The research design used in this study was correlational, which evaluates the relationship between the predictor and the criterion variable. With little to no attempt to control unrelated variables, correlational research is a sort of nonexperimental study in which two variables are measured and the statistical relationship—that is, the correlation—between them is evaluated (Jhangiani, Chiang, Cuttler, & Leighton, 2020). The criterion variable was teacher classroom practices, and the predictor was teacher tech-creativity. The Makurdi Local Government Area in Benue State, Nigeria, is the research area. All of the private primary school instructors in the Makurdi local government area make up the study's population. In Makurdi Local Government Area, fifty private elementary schools provided a sample of seventy mathematics teachers. Schools were drawn using a systematic sampling procedure. Private

schools were used because they are mostly equipped with technologically driven facilities to aid and facilitate teaching and learning.

Two structured instruments developed by the researchers were used for data collection namely: The Mathematics Teacher Tech-Creativity Inventory (MTTI) was an adopted and modified version of the instrument by Rambe, Ndofirepi, and Dzansi (2016), and the Mathematics Teacher Classroom Practice Inventory (MTCPI) was developed by the researchers. The MTTI has three components; firstly, the biodata section; secondly, a selected list of technological tools used by mathematics teachers, such as desktops, calculators, internet surfing, and laptops, and the freedom for teachers to include any other tools they have used; lastly, twelve item statements on teachers' level of creativity. These statements come with four options ranging strongly agree (SA-4), agree (A-3), disagree (D-2), strongly disagree (SD-1). A few of the draft items for MTTI are: "I enjoy trying out new mathematical ideas using technologically driven tools in class," "I am willing to try any new technology-supported method even if there is a chance it could fail," and lastly, "I continuously look at old problems with a fresh mindset guided by latest technology developments during mathematics lessons." The MTCPI is an instrument with 25 items, which cover the five components of teacher clarity, teacher discussion, teacher feedback, formative assessment, and teacher-teacher collaboration with four options ranging from always (A-4), sometimes (S-3), rarely (R-2), never (N-1). It has two sections, the first is the biodata section, and the second section covers components of teacher classroom practices such as teacher clarity, teacher discussion, teacher feedback, formative assessment, and teacher-teacher collaboration. A few selected items from components of the MTCPI are: "give vivid explanations to students who lack the requisite knowledge," "relate the lesson to students to have their opinions," "call students privately to discuss areas of weakness and strengths," "give assignments after each lesson to assess knowledge yet uncovered," "take a cue from other teacher's lesson plans for deeper understanding." Both MTTI and MTCPI were trial-tested to establish their reliability coefficients which were obtained as .82 and .75 respectively. The instruments were given out to three experts to ascertain face validity. Schools selected for the study were visited, permission was sought from various school Head- teachers then, the instruments were administered to the teachers. Correlation and histograms were used to answer the research questions while analysis of variance was used as inferential statistics to test the hypotheses at .05 level of significance.

## RESULTS

**Research Question 1**

What types of technological tools are available for use to enhance teacher classroom practice?

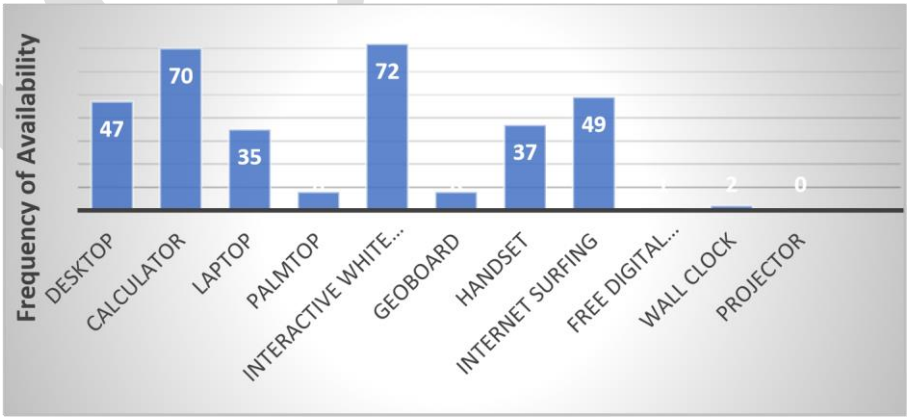


**Figure 1.** Technological tools that foster teacher classroom practices.

Figure 1 shows technological tools listed by the researchers and others included by mathematics teachers. From Figure 1, the top three technological tools among others that mathematics teachers at the primary school level use most often to facilitate their teaching practices are, first interactive

whiteboard, second, the calculator, and third, internet surfing. Projectors and wall clocks are hardly used.

**Research Question 2**

To what extent does teacher tech-creativity foster behaviour affect teacher clarity as a teacher classroom practice?

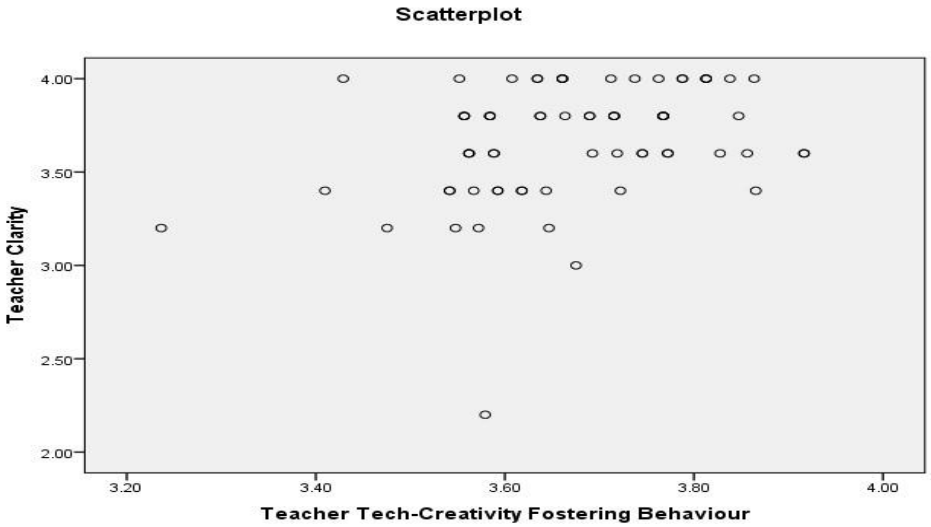


**Figure 2.** Scatterplot for teacher-tech creativity and teacher clarity.

Results from the scatterplot on Figure 2 show a low positive correlation in the responses between teacher-tech creativity and teacher clarity as a teacher classroom practice.

**Table 1.** Correlation analysis of teacher tech-creativity on teacher clarity.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .394[a] | .156 | .143 | .29210 |

a. Predictors : (Constant), MTTI
b. Dependent Variable : Teacher Clarity
c. R-Squared : .156

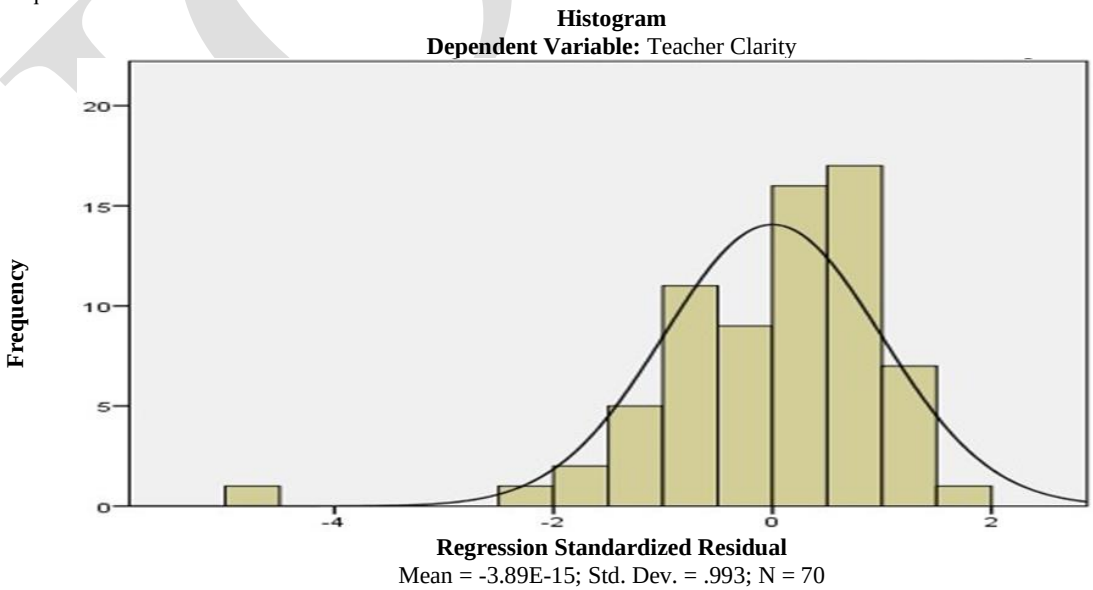


**Figure 3**. Histogram illustrating regression of teacher tech-creativity against teacher clarity.

From Table 1, the results have shown that there is a positive moderate relationship (R= .394) between teacher tech-creativity and teacher clarity as a classroom teaching practice. This means that a single increase in the value of teacher tech-creativity causes a relative increase in the value of teacher clarity in the same direction. Table 1 further shows that 15.6% of the variation in teacher clarity is accounted for by teacher tech-creativity. The histogram on Figure 3, further shows that the distribution is negatively skewed to the left, meaning that the mean value is less than the median value.

**Research Question 3**

To what extent does teacher tech-creativity foster behaviour affect teacher class discussions as a teacher classroom practice?

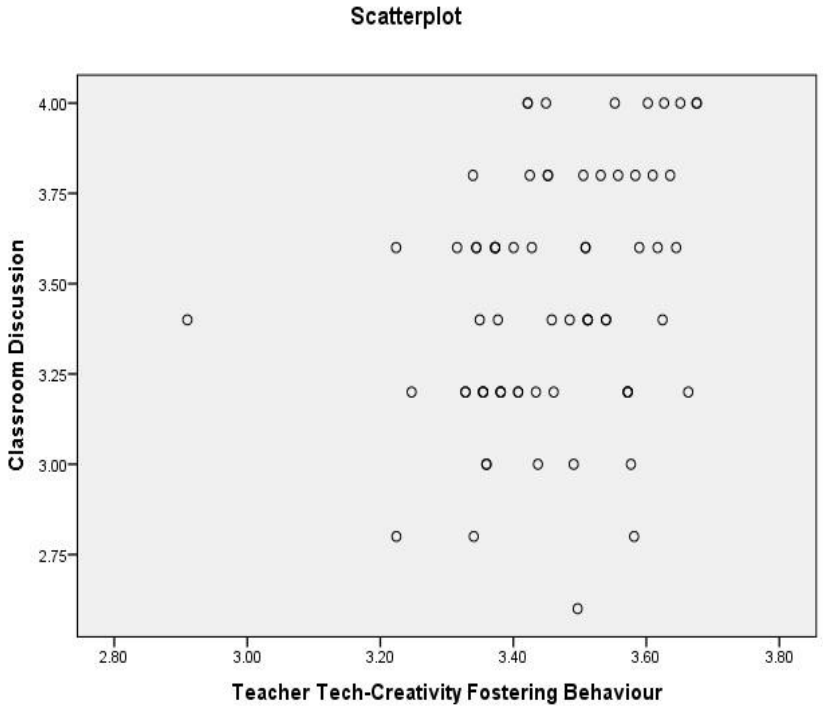


**Figure 4.** Scatterplot for teacher-tech creativity and teacher class discussions.

Results from the scatterplot on Figure 4 show a low positive correlation in the responses between teacher-tech creativity and teacher class discussions as a teacher classroom practice.

**Table 2**. Correlation analysis of teacher tech-creativity on teacher class discussions

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .370[a] | .137 | .125 | .32545 |

a. Predictors : (Constant), MTTI
b. Dependent Variable : Classroom Discussion
c. R-Squared : .137

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

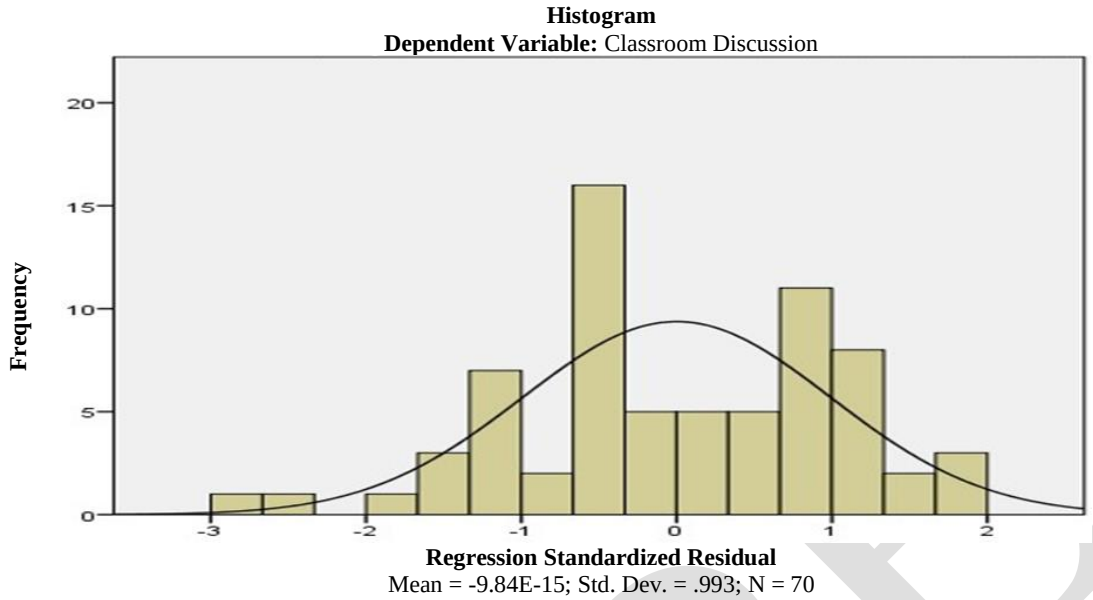


**Figure 5.** Histogram illustrating regression of teacher tech-creativity against teacher classroom discussions.

From Table 2, the results have shown that there is a positive moderate relationship (R= .370) between teacher tech-creativity and teacher classroom discussions as a classroom teaching practice. This indicates that an increase in the value of teacher tech-creativity causes a relative increase in the value of teacher class discussions in the same direction. Table 2 further shows that 13.7% of the variation in teacher class discussions is accounted for, by teacher tech-creativity. The histogram in Figure 5, further shows that the distribution is random, meaning the data patterns were not clear and distinct.

**Research Question 4**

To what extent does teacher tech-creativity foster behaviour affect teacher feedback as a teacher classroom practice?

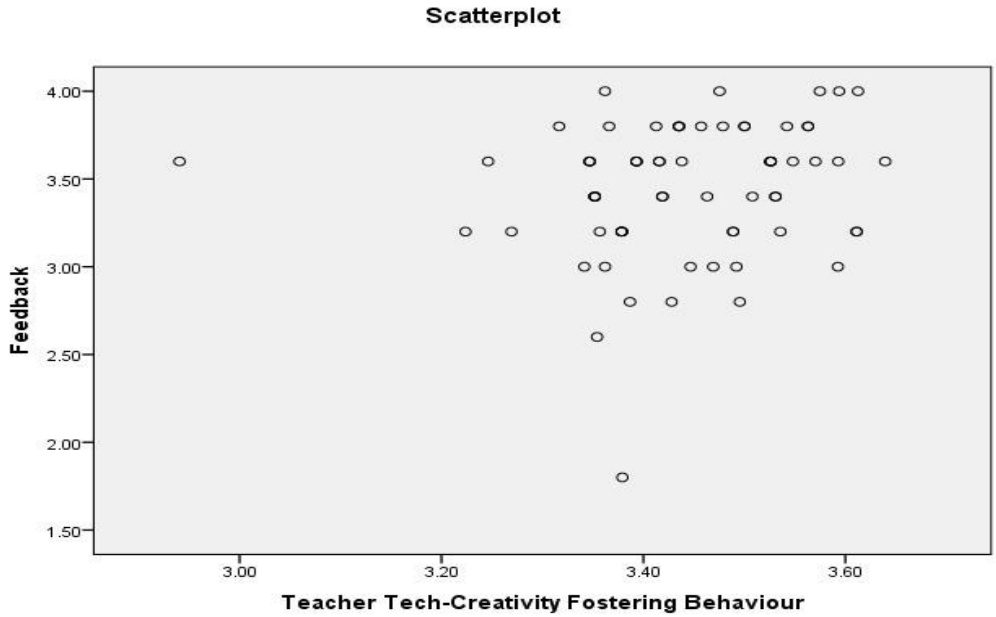


**Figure 6**. Scatterplot for teacher-tech creativity and teacher feedback.

Results from the scatterplot in Figure 6 show a low positive correlation in the responses between teacher-tech creativity and teacher feedback as a teacher classroom practice.

**Table 3**. Correlation analysis of teacher tech-creativity and teacher feedback.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .275[a] | .076 | .062 | .37292 |

a. Predictors : (Constant), MTTI
b. Dependent Variable : Feedback
c. R-Squared : .076

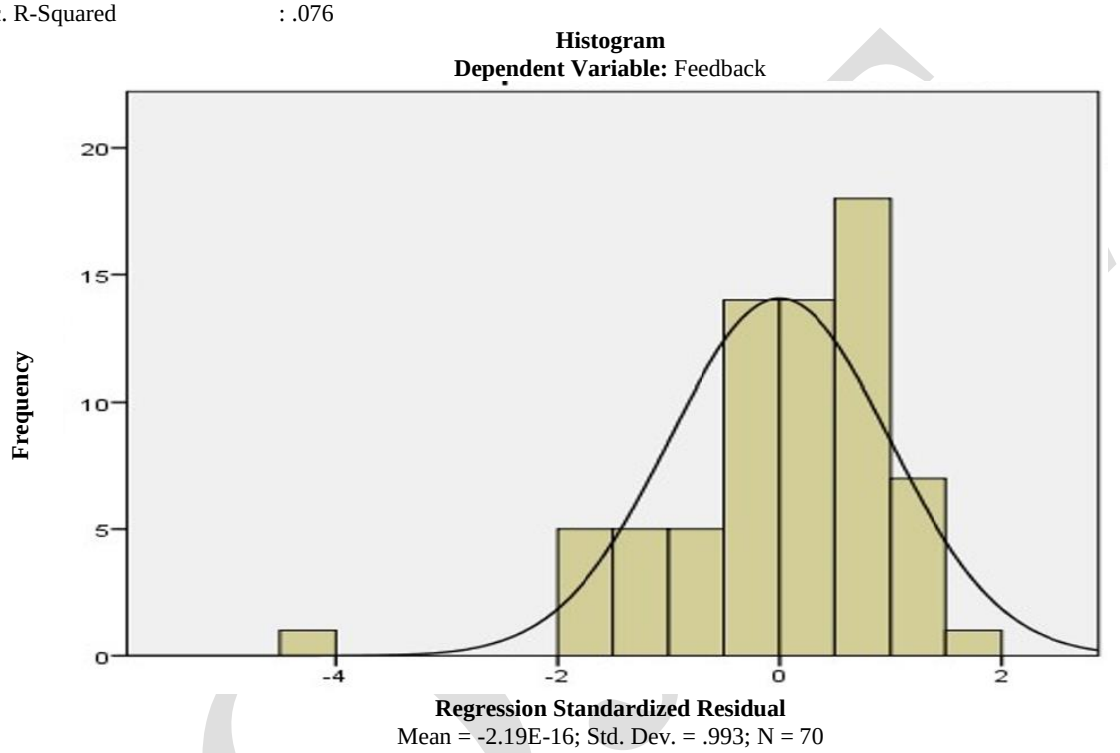


**Figure 7.** Histogram illustrating regression of teacher tech-creativity versus teacher feedback.

From Table 3, the results have shown that there is a weak positive correlation (R= .275) between teacher tech-creativity and teacher feedback as a classroom teaching practice. This indicates that although both teacher tech-creativity and teacher feedback rise in response to one another, the relationship is not very strong. Table 3 shows that 7.6% of the variation in teacher feedback is accounted for by teacher tech-creativity. The histogram in Figure 7 further shows that the distribution is negatively skewed to the left, meaning the mean value is less than the median value.

**Research Question 5**

To what extent does teacher tech-creativity foster behaviour affect teacher formative assessment as a teacher classroom practice?

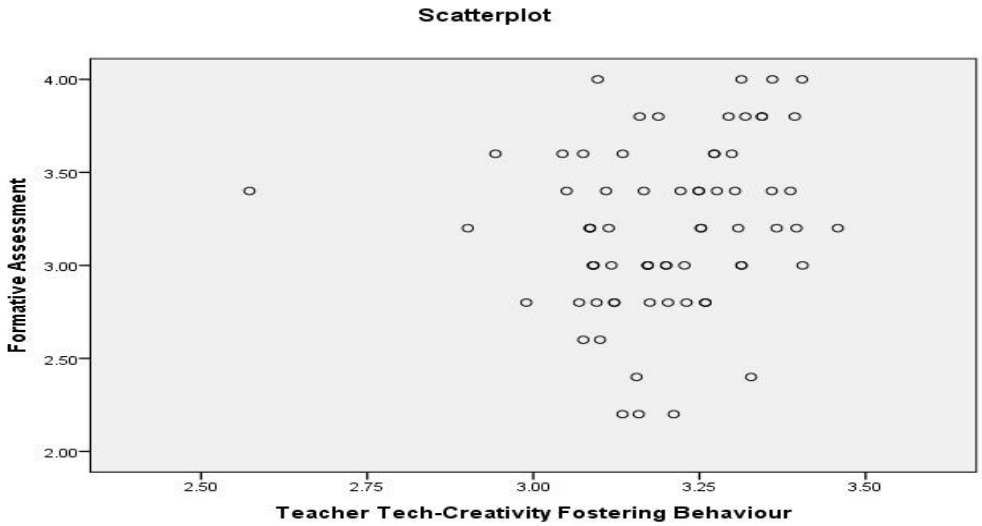


**Figure 8**. Scatterplot for teacher-tech creativity and teacher formative assessment.

Results from scatterplot in Figure 8 show a low positive relationship in the responses between teacher tech-creativity and teacher formative assessment as a teacher classroom practice.

**Table 4**. Correlation analysis of teacher tech-creativity and teacher formative assessment.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .296[a] | .087 | .074 | .42971 |

a. Predictors : (Constant), MTTI
b. Dependent Variable : Formative Assessment
c. R-Squared : .087

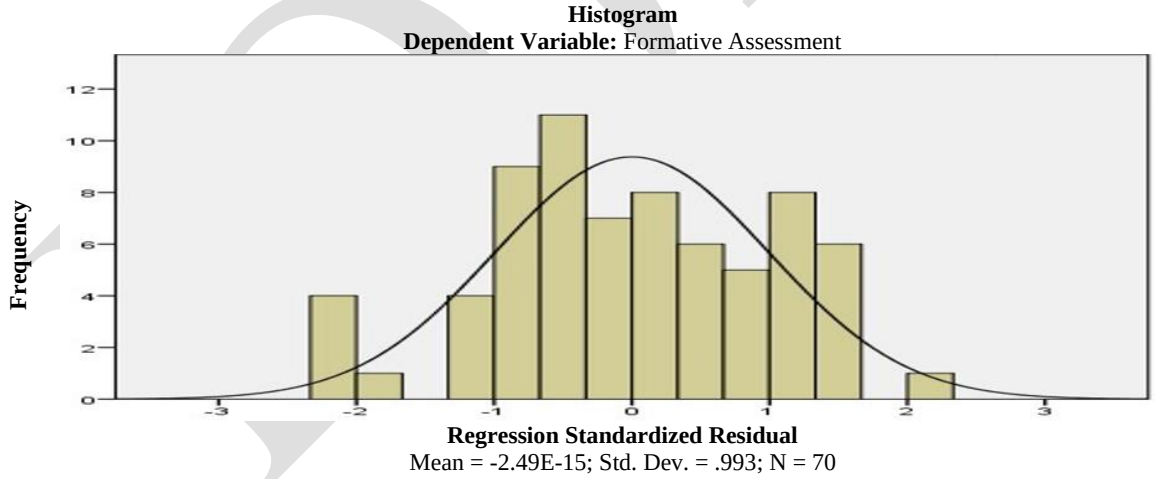


**Figure 9.** Histogram illustrating regression of teacher tech-creativity versus teacher formative assessment.

From Table 4, the results have shown that there is a moderate positive correlation (R= .296) between teacher tech-creativity and teacher formative assessment as a classroom teaching practice. This indicates that although both variables of teacher tech-creativity and teacher formative assessment go up in response to one another, the relationship is not very strong. Table 4 further depicts that an 8.7% proportion in the variation of teacher formative assessment is predicted by teacher tech-creativity. The histogram in Figure 9, shows that the distribution is right-skewed and unimodal, meaning the mean value is greater than the median value, and both the mean and the median are greater than the mode.

**Research Question 6**
To what extent does teacher tech-creativity foster behaviour affect teacher-teacher collaboration as a teacher classroom practice?

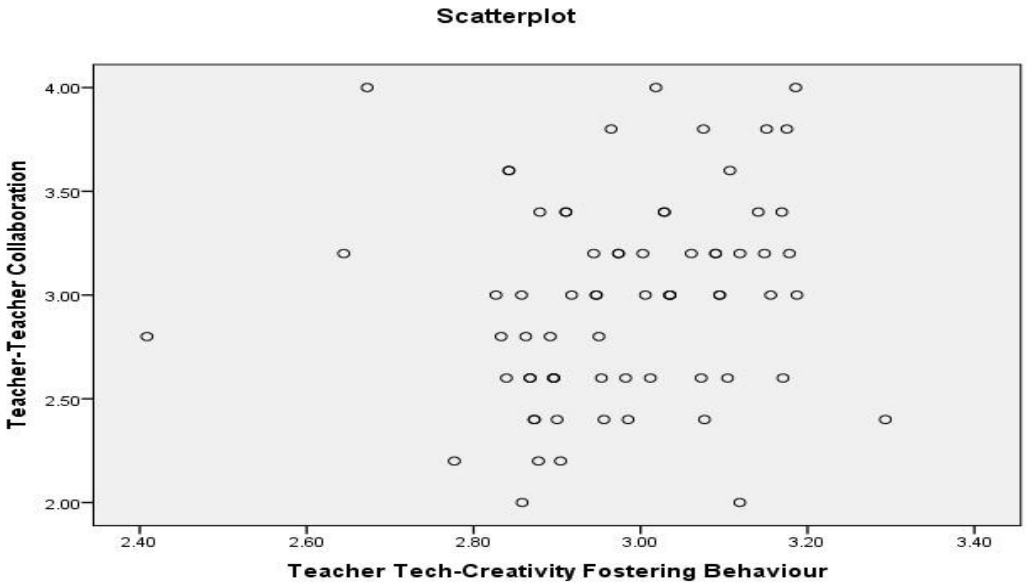


**Figure 10**. Scatterplot for teacher-tech creativity and teacher-teacher collaboration.

Results from the scatterplot in Figure 10 show a low positive relationship in the responses between teacher tech-creativity and teacher-teacher collaboration as a teacher classroom practice.

**Table 5**. Correlation analysis of teacher tech-creativity and teacher-teacher collaboration.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .285[a] | .081 | .068 | .47548 |

a. Predictors : (Constant), MTTI
b. Dependent Variable : Teacher-teacher Collaboration
c. R-Squared : .081

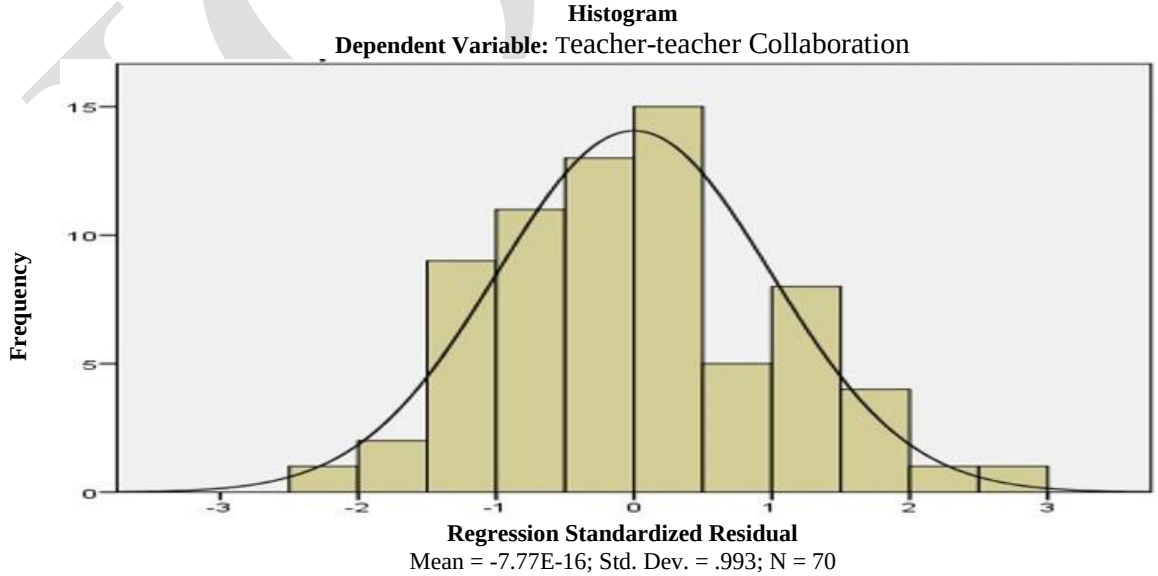


**Figure 11**. Histogram regression of teacher tech-creativity versus teacher-teacher collaboration.

From Table 5, the results have shown that there is a weak positive association (R= .285) between teacher tech-creativity and teacher-teacher collaboration as a classroom teaching practice. This indicates that although both variables of teacher tech-creativity and teacher-teacher collaboration go up in response to one another, the relationship is not very strong. Table 5 further depicts that an 8.1% proportion in the variation of teacher-teacher collaboration is predicted by teacher tech-creativity. The histogram in Figure 11, shows that the distribution is symmetric, meaning the data points are clustered around the mean, with fewer values away from the mean.

**Hypotheses 1**

Teacher tech-creativity fostering behaviour has no significant impact on teacher clarity as a teacher classroom practice.

**Table 6**. ANOVA results of teacher tech-creativity on teacher clarity.

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1.069 | 1 | 1.069 | 12.527 | .001 |
| | Residual | 5.802 | 68 | .085 | | |
| | Total | 6.871 | 69 | | | |

a. Dependent Variable: Teacher Clarity
b. Predictors: (Constant), MTTI

Results from Table 6 show that, the p value (.001) is less than alpha (.05); ($F_{1, 68}$=12.53; p=.001<.05), this indicates statistical significance. Hence, we reject null hypothesis 1, then conclude that teacher tech-creativity fostering behaviour has a significant impact on teacher clarity as a teacher classroom practice.

**Hypothesis 2**

Teacher tech-creativity fostering behaviour has no significant impact on teacher classroom discussion as a teacher classroom practice.

**Table 7**. ANOVA results of teacher tech-creativity on teacher classroom discussions.

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1.146 | 1 | 1.146 | 10.815 | .002 |
| | Residual | 7.202 | 68 | .106 | | |
| | Total | 8.348 | 69 | | | |

a. Dependent Variable: Classroom Discussion
b. Predictors: (Constant), MTTI

Results from Table 7 show that, the p value (.002) is less than alpha (.05); ($F_{1, 68}$=10.82, p=.002<.05), this indicates statistical significance. Hence, we reject null hypothesis 2, and then conclude that teacher tech-creativity fostering behaviour has a significant impact on teacher classroom discussions as a teacher classroom practice.

**Hypothesis 3**

Teacher tech-creativity fostering behaviour has no significant impact on teacher feedback as a teacher classroom practice.

**Table 8**. ANOVA results of teacher tech-creativity on teacher feedback.

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .075 | 1 | .775 | 5.570 | .021 |
| | Residual | 9.457 | 68 | .139 | | |
| | Total | 10.231 | 69 | | | |

a. Dependent Variable: Feedback
b. Predictors: (Constant), MTTI

Results from Table 8 show that, the p value (.021) is less than alpha (.05), ($F_{1, 68}$= 5.57, p=.021<.05), this indicates statistical significance. Hence, we reject null hypothesis 3, then conclude that teacher tech-creativity fostering behaviour has a significant impact on teacher feedback as a teacher classroom practice.

**Hypothesis 4**
Teacher tech-creativity fostering behaviour has no significant impact on teacher formative assessment as a teacher classroom practice.

**Table 9**. ANOVA results of teacher tech-creativity on teacher formative assessment.

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1.204 | 1 | 1.204 | 6.519 | .013 |
| | Residual | 12.556 | 68 | .185 | | |
| | Total | 13.760 | 69 | | | |

a. Dependent Variable: Formative Assessment
b. Predictors: (Constant), MTTI

Results from Table 9 indicate that, the p value (.013) is less than alpha (.05); ($F_{1, 68}$ =6.52; p= .013<.05), this shows statistical significance. Hence, we reject null hypothesis 4, then conclude that teacher tech-creativity fostering behaviour has a significant impact on teacher formative assessment as a teacher classroom practice.

**Hypothesis 5**
Teacher tech-creativity fostering behaviour has no significant impact on teacher-teacher collaboration as a teacher classroom practice.

**Table 10**. ANOVA results of teacher tech-creativity on teacher-teacher collaboration.

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1.359 | 1 | 1.359 | 6.010 | .017 |
| | Residual | 15.373 | 68 | .226 | | |
| | Total | 16.732 | 69 | | | |

a. Dependent Variable: Teacher-teacher Collaboration
b. Predictors: (Constant), MTTI

Results from Table 10 indicate that, the p value (.017) is less than alpha (.05); ($F_{1, 68}$=6.01; p=.017<.05), this shows statistical significance. Hence, we reject null hypothesis 5, then conclude that teacher tech-creativity fostering behaviour has a significant impact on teacher-teacher collaboration as a teacher classroom practice.

## DISCUSSION, CONCLUSION, and RECOMMENDATIONS

Findings from the research show that tech-creativity fostering behaviour significantly impacts teacher clarity in class. To support this finding, Costley (2014) found that technology provides meaningful experiences for both teacher and students; by using the computer, students believed that they understood the teacher and lesson better and as well were able to recall what was taught to them previous days. The synergy of tech-creativity and teacher verbal explanations brings about clarity of lessons because mathematics teachers have to be creative when bringing about relevant instructions via technology to enhance lesson clarity.

The findings from this work show that tech-creativity fostering behaviour significantly impacts teacher classroom discussions. To support this finding, the work of Coffey (2012) found that integrating technology and peer-led discussions into teaching can produce class engagement and motivation. Herron (2012) discovered that using the internet to surf materials and get the information needed to foster learning and gainful knowledge, exposed students to mathematics activities at different levels as such students were able to engage in class and discuss their activities. When mathematics teachers find creative ways of internalizing and building technology into lesson delivery, this can foster and encourage class discussions.

Another finding from this study discovered that teacher tech-creativity fostering behaviour had a significant impact on teacher feedback as a teacher classroom practice. Male, Burden, Martin, Hopkins, and Trala (2012) found that teachers reported that iPads as digital tools enabled them to provide better feedback to learners about learning. Feedback is an essential tool teachers use to inform their instruction

and assessment; it further helps the teacher to gauge students' comprehension and evaluate their teaching practices. Hence, using tech tools creatively to facilitate the process, enhances students' learning growth and helps teachers better their future instructions and assessments.

It is found in this study that teacher tech-creativity fostering behaviour has a significant impact on teacher formative assessment as a teacher classroom practice. It is along this line that Jewitt, Clark, and Hadjithoma-Garstka (2011) found that using digital learning and teaching resources provides a safer space for formative assessment and feedback. Elmahdi, Al-Hattami, and Fawzi (2018) findings also corroborate the findings of this research. It was discovered that using technology-based tools such as Plickers, enhanced formative assessment, and immediate feedback; using technology-based tools leads to creating an effective teaching and learning environment. Nicol (2008) found that technology supports assessment practices and can help teachers construct and present assessment tasks, make valid judgments of students' progress, and support the production and delivery of marks. It is worthy of note that mathematics teachers necessarily need to be creatively selective with technological tools that can enhance formative assessment of mathematics instructions.

Another finding from this research discloses that there is a significant impact of teacher-tech creativity on teacher-teacher collaboration. To buttress this finding, the work of Nwoke, Nwoga, and Emenyonu (2018) found that technology supports creativity in the classroom because it is a medium that requires interaction. Interaction comes as a result of collaboration, when people interact, they find a level ground and basis for which they can collaborate or work together to achieve meaningful results.

It can be concluded that integrating technology and creativity into lesson instructions could advertently close the gap created by conventional teaching approaches, since is it rather ideal in its sense to promote transformative classroom practices that embrace creativity, technology, and education to help empower teachers to successfully implement instructions and educational goals. Technology alone will not enhance teaching and learning, but using it creatively has enhanced teacher clarity, teacher classroom discussion, teacher feedback, teacher formative assessment, and teacher-teacher collaboration as part of good teaching practice that can open new doors for learners and teachers.

**Recommendations**

Teachers of mathematics should consider utilizing technological tools blended with a creative mindset to help foster innovative approaches to instructions during lessons since this can advance classroom teaching practices. Promoting this practice can further impact teachers' skills and professional development creatively to enhance teacher clarity, teacher classroom discussion, teacher feedback, teacher formative assessment, and teacher-teacher collaboration.

**Limitations**

This work is limited to only private schools in Makurdi Local Government Area of Benue State, since they mandatorily make provision for necessary infrastructures and resources to handle technological tools; hence generalizations cannot be inferred on the entire Benue State. In Benue State, there are urban and rural districts where schools are located, rural schools will not have enough facilities and mechanisms to effectively man technological tools due to environmental conditions. Additionally, tech-creativity and teaching practices have not been observed but have been conducted by self-report data, which can be distorted because of different understandings of the items or biased due to social desirability (Safrudiannur, 2020).

**Ethics and Conflict of Interest**

All ethical rules were observed at all stages of the research. Authors declare that they acted in accordance with ethical rules in all processes of the research. Authors declare that there is no conflict of interest between the authors of this work.

**Author Contributions**

All authors' contributions to the article are equal in every aspect. All authors have read and agreed to the published version of this work.

**Corresponding Author**
Correspondence to Martha Mimi CHIANSON-AKAA, searchhbk@yahoo.com

## REFERENCES

Achor, E. E. (2022). Integrating technologies in curriculum development. *Journal of Curriculum and Instruction*, *13*(2022), 4-33.

Achor, E. E. (2020). *Cognitive dimension in demystifying abstract concepts in physics*. Benue State University Inaugural Lecture Series, No. 15. 20th February, 2020

Agogo, P. O. (2018). *Promoting the culture of creativity and innovation in Nigeria education system*. A paper presented at GRAMS School speech and prize giving day, held at the school premises in Makurdi on the 28th July.

Alber, R. (2015). *Five highly effective teaching practices*. 12 September 2023 retrieved from https://www.edutopia.org/blog/5highly-effective

Anderson, L. W., Krathwohl, D. R., & Bloom, B. S. (2001). (*Benjamin S. A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives* / Editors, Lorin W. Anderson, David Krathwohl; Contributors, Peter W. Airasian ... [et Al.]. Complete ed. Longman. quincycollege.edu/wpcontent/uploads/Anderson-and-Krathwohl_Revised-Blooms-Taxonomy.pdf

Arkansas State University (2020). *The importance of teacher collaboration*. Retrieved from The Importance of Teacher Collaboration | A-State Online (astate.edu). https://degree.astate.edu/online-programs/education/master-of science/ed-leadership...

Bay Atlantic University (2022). *How does technology impact students' learning*? Retrieved from How Does Technology Impact Student Learning? (bau.edu) https://bau.edu>blog>technology...

Benton, S., & Li, D. (2021). *Teacher clarity: Cornerstone of effective teaching*. IDEA paper, 83. Retrieved from Idea-Paper-83_5-21v4.pdf (windows.net)

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education, 5, 7-74*. http://dx.doi.org/10.1080/0969595980050102

Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, *21*(1), 5–31. https://doi.org/10.1007/s11092-008-9068-5

Blazar, D., & Kraft, M. (2017). Teacher and teaching effects on students' attitudes and behaviors. *Educ. Eval. Policy Anal.* 39, 146–170.

BrckaLorenz, A., Ribera, T., Kinzie, J., & Cole, E. R. (2012). 10: Examining effective faculty practice: teaching clarity and student engagement. *To Improve the Academy A Journal of Educational Development, 31*(1), 148-159. https://doi.org/10.1002/j.2334-4822.2012.tb00679.x

Cashin, W. E. (2011). *Effective classroom discussions*. IDEA Paper #49. Manhattan, KS: The IDEA Center.12 September 2023 retrieved from http://www.ideaedu.org/Portals/0/Uploads/Documents/IDEA%20Papers/IDEA%20Papers/IDEA_Paper_49.pdf. Effective Classroom Discussions | IDEA (ideaedu.org)

Carlile, O., & Jordan, A. (2012). *Approaches to creativity: A guide for teachers*. Maidenhead: Open University Press.

Cicconi, M. (2013). Vygotsky meets technology: A reinvention of collaboration in the early childhood mathematics classroom. *Early Childhood Education Journal, 42*(1), 57–65. doi:10.1007/s10643-013-0582-9

Coffey, G. (2012). Literacy and technology: Integrating technology with small groups, peer-led discussions of literature. *International Electronic Journal of Elementary Education*, *4*(2), 395-405.

Cornelius-Ukpepi, B. U., & Aglazor, G. (2019). Teacher classroom practice: A case study of teachers' awareness of students' learning styles in Calabar, Cross River State, Nigeria. *International Journal of Quantitative and Qualitative Research Methods, 7*(3), 1-7. https://www.researchgate.net/publication/333787198

Costley, K. C. (2014). The positive effects of technology on teaching and student learning. Department of Education (gov.). 20 October 2023 retrieved from https://eric.ed.gov/?id=ED554557

Darma, Q., Notosudjono, D., & Herfina, D. (2021). Strengthening teamwork, visionary leadership and self-efficacy in efforts to improve teacher's creativity. *Psychology and Education*, *58*(4), 3825–3837.

Deeley, S. J. (2018) Using technology to facilitate effective assessment for learning and feedback in higher education. *Assessment & Evaluation in Higher Education*, *43*(3), 439-448. DOI: 10.1080/02602938.2017.1356906

Eiland, L. S., & Todd, T. J. (2019). Considerations when incorporating technology into classroom and experiential teaching. *The Journal of Pediatric Pharmacology and Therapeutics, 24*(4), 270-275. https://doi.org/10.5863/1551-6776-24.4.270

Elmahdi, I., Al-Hattami, A., & Fawzi, H. (2018). Using technology for formative assessment to improve students' learning. *The Turkish Online Journal of Educational Technology, 17,* 182-188.

European Space Agency (2023). *What is technology.* Retrieved from https://www.esa.int>what_is_techn.... ESA - What is technology?

Fitriah, A. (2018). The role of technology in teachers' creativity development in English teaching practices. *Teflin Journal, 29*(2), 177-193. http://dx.doi.org/10.15639/teflinjournal.v29i2/177-193

Gonscherowski, P., & Rott, B. (2022). *Digital competencies of pre-/in-service teachers – An interview study*. Twelfth Congress of the European Society for Research in Mathematics Education (CERME12), Feb. 2022, Bozen-Bolzano, Italy. HALid: hal-03747501.

Gyuse, E. Y., Achor, E. E., & Chianson, M. M. (2014). How creative are secondary school students in Nigeria? In Z.C., Njoku (Ed.), *STEM education and creativity*. Proceedings of 55th Annual Conference of Science Teachers' Association of Nigeria, Aug 18-23, 146-159. Available at https://ssrn.com/abstract=2487968

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers, 3,* 275-285. https://doi.org/10.1016/j.susoc.2022.05.004

Hattie, J. A (2012). *Visible learning for teachers: Maximizing impact on learning*. London, UK: Routledge. https://doi.org/10.4324/9780203181522

Hattie, J., & Timperly, H. (2007). The power of feedback. *Review of Educational Research,77*(1), Sage Journals. https://doi.org/10.3102/003465430298487

Henriksen, D., Mishra, P., & Fisser, P. (2016). Infusing creativity and technology in 21st century education: A systemic view for change. *Educational Technology & Society*, *19*(3), 27–37.

Herron, J. (2010). Implementation of technology in an elementary mathematics lesson: The experiences of pre-service teachers at one university. *SRATE Journal, 19*(1), 22-29.

Jewitt, C., Clark, W., & Hadjithoma-Garstka, C. (2011). The use of learning platforms to organise learning in English primary and secondary schools. *Learning, Media, and Technology, 36*(4), 335-348. DOI:10.1080/17439884.2011.621955.

Jhangiani, R. S., Chiang, C. A., Cuttler, C., & Leighton, D. C. (2020). *Research methods in psychology (4th ed.).* Kwantlen Polytechnic University Surrey, B.C. 15 November 2023. Retrieved from https://kpu.pressbooks.pub/psychmethods4e/

Jimin, N., Chianson-Akaa, M. M., & Amua, E. D. (2023). Teacher feedback techniques: An analyses of students' self-efficacy in mathematics. *International Journal of Research and Innovation in Social Science (IJRISS)*, Feb 21, 2023, 1316-1326.

Kolleck, N., Schuster, J., Hartmann, U., & Grasel, C. (2021). Teachers' professional collaboration and trust relationships: An inferential social network analysis of teacher teams. *Research in Education, 111*(1), 89-107. DOI: 10.1177/00345237211031585.

Kosko, K. W. (2012). Student enrollment in classes with frequent mathematical discussion and its longitudinal effect on mathematics achievement. *The Mathematics Enthusiast, 9*(1),111–148. DOI: https://doi.org/10.54870/15513440.1237

Lapeniene, D., & Dumciene, A. (2014). Teachers' creativity: Different approaches and similar results. *Procedia – Social and Behavioral Sciences, 116*, 279–284. http://dx.doi.org/10.1016/j.sbspro.2014.01.208.

Li, Y., Kim, M., & Palker, J. (2022). Emerging technologies to promote creativity in education: A systematic review. *International Journal of Educational Research Open 3*. https://doi.org/10.1016/j.ijedro.2022.100177

Lopez-Fernandez, O. (2021). Emerging health and education issues related to internet technologies and addictive problems. *Int. J. Environ. Res. Public Health*, *18*(1), 321. https://doi.org/10.3390/ijerph18010321

Male, T., Burden, K., Martin, S., Hopkins, P., & Trala, C. (2012). iPad Scotland Evaluation. Retrieved from https://api.semanticscholar.org/CorpusID:203103531

Mgboro, C. U., & HU, O. F. U. (2019). Enhancing teacher creativity using digital technology. *Journal of Education and Practice*, 202111, 3(1), 2. https://doi.org/10.6897/IETITEM

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017-1054. https://doi/10.1111/j.1467-9620.2006.00684.x

Mishra, P., Koehler, M. J., & Henriksen, D. (2011). The seven trans-disciplinary habits of mind: Extending the TPACK framework towards 21st century learning. *Educational Technology*, *51*(2), 22–28. http://www.jstor.org/stable/44429913

Nicol, D. (2008). Technology-supported assessment: A review of research. Unpublished manuscript available *at* http://www.reap.ac.uk/resources.html Technology-supported Assessment: A Review of Research (researchgate.net)

Nwoke, B. I., Nwoga, A. N., & Emenyonu, A. O. (2018). Impact of technology on secondary school students' creativity in mathematics: A case for internationalization of education in Nigeria. *Multidisciplinary Journal of Research Development*, *27*(1), 13-20. Nwoke-et-al-pp.-163-1741.pdf (unn.edu.ng)

Oroujlou, N., & Vahedi, M. (2011). Motivation, attitude, and language learning. *Proc. Soc. Behav. Sci.* 29, 994-1000. doi:10.1016/j.sbspro.2011.11.333. Motivation, attitude, and language learning (researchgate.net)

Ortese, P. T, Yawe, A., & Akume, G. T. (2014). *Psychology of learning*. Makurdi: Eagle Prints.

Puentedura, R. R. (2006). Transformation, technology, and education in the state of Maine. Retrieved from http://www.hippasus.com/rrpweblog/archives/2006_11.html

Rankin, J., & Brown, V. (2016). Creative teaching method as a learning strategy for student midwives: A qualitative study. *Nurse Educ. Today*, *38*, 93-100. https://doi.org/10.1016/j.nedt.2015.12.009. Creative teaching method as a learning strategy for student midwives: A qualitative study - PubMed (nih.gov)

Rambe, P., Ndofirepi, T. M., & Dzansi, D. Y. (2016). *Technological creativity and its influence on entrepreneurship intentions of vocational education students*. Central University of Technology, South Africa. 13 August 2023 retrieved from https://www.researchgate.net/publication/308467442

Richter, D., & Pant, H. A. (2016). *Teacher cooperation in Germany: A study on cooperative industrial relations among secondary school teachers*. Gutersloh: Bertelsmann Foundation, Robert Bosch Stiftung, Stiftung Mercator and Deutsche Telekom Stiftung. 13 August 2023 retrieved from https://www.researchgate.net/publication/296677616_Lehrerkooperation_in_Deutschland_EineStudie_zu_kooperativen_Arbeitsbeziehungen_bei_Lehrkraften_der_Sekundarstufe_I. https://doi.org/10.1177/1741143220945689

Rott, B., & Liljedahl, P. (2018, July). *Creativity or imagination: Challenges with measuring creativity.* Paper presented at 42nd Conference of the International Group for the Psychology of Mathematics Education, Umea, Sweden

Safrudiannur, S. (2020). Measuring teachers' beliefs: A comparison of three different approaches. In: Measuring Teachers' Beliefs Quantitatively. Kölner Beiträge zur Didaktik der Mathematik. Springer Spektrum, Wiesbaden. https://doi.org/10.1007/978-3-658-30023-4_4

Sharma, S. (2023). *Supporting student engagement with technology*. Retrieved from https://www.edutopia.org/article/using-technology-support-student-engagement.

Sierotowicz, T. (2015). What is technological creativity? *Contemporary Global Perspectives on Gender Economy, 29.* DOI:10.4018/978-1-4666-8611-3.ch014. What is Technological Creativity | IGI Global (igi-global.com)

Sweller, J. (1998). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*(2), 257-285. https://doi.org/10.1207/s15516709cog1202_4

Ugwuogo, C. C. (2011). *Status of e-teaching and e-learning in Nigeria Colleges of Education* (Unpublished PhD Thesis). Ebonyi State University, Abakaliki.

UNESCO (2023). *Technology in education*. GEM Report. Retrieved from https://gem-report-2023.unesco.org/technology-in-education/

Vygotsky, L. (1978). *Mind in society*. London: Harvard University Press. Retrieved from https://gsi.berkeley.edu>sociol-con...

Yalcinalp, S., & Avci, Ü. (2019). Creativity and emerging digital educational technologies: A systematic review. *Turkish Online Journal of Educational Technology - TOJET, 18*(3), 25-45.

Zhang, L., & Zheng, Y. (2018). Feedback as an assessment for learning tool: How useful can it be? *Assessment & Evaluation in Higher Education*, *43*(7), 1120-1132. DOI: 10.1080/02602938.2018.1434481

**About the authors:**

**Martha Mimi CHIANSON-AKAA**
Martha Mimi Chianson-Akaa is a Senior Lecturer of Mathematics Education at Benue State University, Makurdi Nigeria. She is a para-counselor inducted into the University Counseling Unit and currently the Postgraduate Coordinator (department). Her research interest areas are classroom practices, teacher professional development and learning strategies. Her teaching emphasizes collaboration and equity to improve the quality of teaching-learning in the classroom.

**Emmanuel Edoja ACHOR**
Prof. Emmanuel Edoja Achor is a Professor of Physics Education at the Benue State University, Makurdi, Nigeria. He is the former Head of Department, of Science and Mathematics, Education. He is a consultant data analyst. He is a former Consultant Researcher and Data Analyst, United Nation Development Project, and former NUC/World Bank Consultant- Lead, Higher Education Programme Specialist (LHEPS). His research areas are metacognitive awareness, curriculum development and teacher professional development.

**Benjamin ROTT**
Dr. Benjamin Rott is Professor of Mathematics Education at the University of Cologne. His research focuses on mathematical problem solving, beliefs, and giftedness (including creativity). His recent works also focus on teachers' competencies and especially digital competencies.

IOJPE

IOJPE

ISSN: 1300 – 915X
www.iojpe.org

*International Online Journal of Primary Education* *2024, volume 13, issue 1*

# EARLY CHILDHOOD PROSPECTIVE TEACHERS' TEAMWORK ABILITY USING CREATIVE DRAMA ACTIVITIES

Wanitcha SITTIPON
Dr., Early childhood education program, Faculty of home economics technology, RMUTT, Thailand
ORCID: https://orcid.org/0000-0002-3952-5969
wanitcha_s@rmutt.ac.th

Pornsiri SANTUM
Early childhood education program, Faculty of home economics technology, RMUTT, Thailand
ORCID: https://orcid.org/0000-0003-3308-8320
pornsiri_s@rmutt.ac.th

Praditha PARSAPRATET
Assist.Prof.Dr., Early childhood education program, Faculty of home economics technology, RMUTT, Thailand
ORCID: https://orcid.org/0009-0005-9014-1679
praditha_p@rmutt.ac.th

**Received:** September 06, 2023 **Accepted:** February 25, 2024 **Published:** March 31, 2024

**Suggested Citation:**
Sittipon, W., Santum, P., & Parsapratet, P. (2024). Early childhood prospective teachers' teamwork ability using creative drama activities. *International Online Journal of Primary Education (IOJPE), 13*(1), 23-32. https://doi.org/10.55020/iojpe.1356317

This is an open access article under the CC BY 4.0 license.

**Abstract**

The goals of this study are to investigate the teamwork abilities of early childhood prospective teachers and compare the teamwork abilities of early childhood prospective teachers who have learned through creative drama activities to a 75% criterion. The study is mixed method research of 54 third-year prospective teachers majoring in early childhood education at the faculty of home economic technology at Rajamangala University of Technology Thanyaburi (RMUTT) who are enrolled in an English language course for preschool instructors. An assessment of teamwork abilities form and a reflection form on the collaborative process are among the tools for gathering data. Quantitative data analysis was carried out using descriptive statistics such as the mean, standard deviation, and one-sample t-test. Content analysis was used to analyse qualitative data. The research findings revealed that early childhood education students' overall teamwork abilities were high, and teamwork abilities of early childhood prospective teachers who learned through creative drama activities were significantly higher than the criterion of 75% statistical significance at .01.

**Keywords:** Teamwork abilities, early childhood prospective teachers, creative drama activities.

## INTRODUCTION

Conflicts and factional divides are hallmarks of today's society, reflecting a failure to recognize and comprehend variations in viewpoints, values, and operational strategies.. Such problems can lead to political and social unrest, which can hinder efforts to create a more accepting and peaceful society (Goncalves & de Souza, 2021). In order to prosper in the dynamic needs of the economy and society, students must possess 21st-century learning skills.. In Thailand, education management has been given significant emphasis to enable its people to reach their full potential and acquire the necessary skills and competencies to meet the needs of the economy and advance the country's progress (The Secretariat of the Education Council, 2017).

Collaboration has emerged as a crucial 21st-century learning capacity, given the wide range of human potential and skills (Woolf & Woolf, 2016). Teams that work together can do more than individuals can on their own, fostering a collaborative environment where individuals can learn from one another and advance their careers (Johnson & Johnson, 2014). Furthermore, collaboration fosters a safe and welcoming environment for all members (Schneider et al., 2004; Vygotsky, 1978; Tang, 2020). According to research, successful teams are built on the four cornerstones of responsibility,

problem-solving skills, cooperation, and commitment (Katzenbach & Smith, 2008; O'Neill, McNeese, Barron & Schelble, 2022). Responsibility entails knowing one's role in the team, contributing effectively, and staying committed until the job is done. Problem-solving skills involve consulting others, discussing issues, providing suggestions, and accepting others' input. Cooperation entails supporting each other, considering everyone's ideas, and working together to achieve a common goal. Team members' performance and trust in each other can improve if they take the time to understand each other's strengths and weaknesses (Hartel, Fujimoto, Strybosch, & Fitzpatrick, 2019).

The COVID-19 pandemic has severely impacted the Department of Early Childhood Education, forcing them to turn to virtual classrooms, which has negatively affected third-year prospective teachers' ability to work together in groups. Working techniques, communication barriers, role ambiguity, repetitive work, relationship issues, and a lack of trust may all contribute to students' inability to work together, which is a typical problem in Thai culture, where people tend to prefer solo pursuits (UNESCO, 2021; Ruangwitoo, 2021). Creative drama activities, such as dramatic exercises, can be effective teaching methods when age-appropriate materials and activities involving role-playing and action are used (Briones, Gallego & Palomera, 2022). According to research, kids who engage in these activities gain resilience, enhance their social skills, and experience other useful outcomes. (Burdette & Whitaker, 2005; Pellegrini & Smith, 1998; Sawangchareon et al., 2021). Unlike traditional performances, creative drama activities put the needs and development of the students before the needs of the audience or the use of acting skills. (O'Neill & Lambert, 2014). Teachers who use drama activities to spark their students' imaginations can enhance their English language skills, social skills, increased empathy, improved self-confidence, and ability to adapt to new situations (Bolin, 2017; Manalo, 2019). In addition, drama activities encourage students to think creatively, collaborate with others, and step outside their comfort zones. Through dialogue, tone, and body language practice, students can improve their ability to communicate both verbally and nonverbally. (O'Neill & Lambert, 2014). Dramatic activities also often involve collaboration and teamwork, which can help students develop stronger social skills. Additionally, putting oneself in someone else's shoes can help students develop empathy and understanding for others. Finally, performing in front of others, receiving constructive feedback, and taking on different roles can all help students build self-confidence and self-esteem (Kao, 2018; Johnson & Russell, 2014). Therefore, these events should take place in a safe and stress-free environment for students to fully focus on improving their skills (Goldstein, 2009).

According to a report by the World Economic Forum, the ability to work in a team is one of the top 10 skills needed to succeed in the workplace of the future (World Economic Forum, 2020). As the economy becomes increasingly global and interconnected, teamwork and collaboration are essential to solving complex problems and driving innovation. Additionally, in a rapidly changing society, individuals need to work together to adapt to new challenges and opportunities. However, third-year prospective teachers cannot work together in groups; communication barriers, role ambiguity, repetitive work, relationship issues, and a lack of trust may all contribute to students' inability to work together. Therefore, researchers are interested in investigating the teamwork abilities of early childhood prospective teachers and comparing the teamwork abilities of early childhood prospective teachers who have learned through creative drama activities to a 75% criterion.

## METHOD

### Research Design

Mixed-methods research incorporates the characteristics of both qualitative and quantitative approaches. This study uses a research strategy to improve their understanding of a research issue by integrating the benefits of qualitative methods with observations and reflections on student behavior and quantitative methods for assessing student behavior in the post-learning period.

**Study Group**
The study group consists of 54 male and female students in the 3rd year of teacher education in early childhood education at the Faculty of Home Economics Technology at RMUTT. English for Early Childhood Teachers in Semester 1 of the Academic Year 2022.

**Research Instruments**
The research instruments are divided into two categories as follows:

The tools used in conducting the research are learning plan 06-325-302 English for Early Childhood Teachers, 8 plans, 8 weeks, 4 hours each, total of 32 hours. Five experts evaluated the learning plan's quality; content validity was measured by an item-objective congruence index (IOC) ranging from .67 to 1.00.

**Data Collection Tools**
1) The assessment of teamwork abilities is divided into three parts: Part 1 is general information consisting of five multiple-choice questions; Part 2 is an assessment of teamwork abilities consisting of a five-level Likert scale with 28 items; and Part 3 is three recommendations consisting of short answers. Five experts evaluated the research tool's quality; content validity was measured by an item-objective congruence index (IOC) ranging from .67 to 1.00; and the internal reliability coefficient of the test was found to be .95.

2) Reflection form about the collaborative process of students is an open-ended recording of 5 questions for students to use to record how they work throughout the process.

**Data Collection**
This research is a mixed-methods research details as follows:

Plan of the 06-325-302 course: English for early childhood educators through the use of creative theater exercises to organize instruction. In experiments, researchers separate prospective teachers into 5 groups, teach using a learning plan, observe and collect reflections about the collaborative process of students in every week.

Assess the teamwork ability of Third-year prospective teachers in Early Childhood Education

Use the scores obtained to assess the teamwork abilities to analyze the data. The criteria for interpreting the data have been determined as follow:

4.50 – 5.00 means the highest level of teamwork ability.
3.50 – 4.49 means high level of teamwork ability.
2.50 – 3.49 means moderate teamwork ability.
1.50 – 2.49 means low level of teamwork ability.
1.00 – 1.49 means minimal teamwork ability.

**Data Analysis**
Data analysis is divided into both quantitative and qualitative as follows:

Quantitative data analysis uses descriptive statistics, including mean, standard deviation and One sample t-test of the teamwork ability assessment, divided into 4 areas: 1) responsibility, 2) problem-solving ability, 3) collaboration, and 4) team relationships.

Qualitative data analysis using content analysis from the transcript form reflects on the collaborative process of students and verifies the accuracy of data using the triangulation method.

## RESULTS

Teamwork ability of 3rd year prospective teachers in Early Childhood Education, Faculty of Home Economics Technology, RMUTT found that the average teamwork ability score of students was high ($M$ = 4.00). Collaboration and team relationships (Table 1) the details are as follows:

**Table 1**. Teamwork Ability of 3rd year prospective teachers in Early Childhood Education Faculty of Home Economics Technology, RMUTT.

| List | Mean | Std.Dev. | Level |
|---|---|---|---|
| **Responsibility** | 3.89 | .49 | high |
| Set goals and plan collaborations systematically. | 3.85 | .55 | high |
| Define methods, workflows, durations, roles, and ways to work in groups together for ease of implementation. | 3.59 | .57 | high |
| Pay attention to the planning work and work according to the plan effectively. | 4.03 | .48 | high |
| Attend meetings to discuss problems at work. | 3.97 | .66 | high |
| Focus and dedication to teamwork | 4.09 | .29 | high |
| Collaborate as a team member to the best of your ability. | 4.21 | .56 | high |
| Able to coordinate within the team quickly and simultaneously | 3.52 | .53 | high |
| **Problem-solving ability** | 4.04 | .44 | high |
| Analyse the problem before sharing feedback with team members. | 4.05 | .59 | high |
| Focus or suppress emotions to solve challenges. | 4.00 | .39 | high |
| Together with the team, make decisions and rationally choose solutions to problems. | 3.90 | .49 | high |
| Be patient when encountering problems working together. | 3.98 | .38 | high |
| Offer creativity to analyse and solve teamwork problems. | 4.08 | .56 | high |
| Provide information and feedback to collaborate. | 4.21 | .42 | high |
| Contribute to improving how teams work. When the problem cannot be solved with the original method | 4.12 | .49 | high |
| **Cooperation** | 4.02 | .45 | high |
| Accept and follow team rules. | 4.09 | .44 | high |
| Leadership roles are distributed. | 3.66 | .47 | high |
| Communicating with team members helps them understand data and know progress. | 3.66 | .64 | high |
| Be willing to help and share knowledge, ideas, and experiences with teammates. | 4.15 | .34 | high |
| Exchange ideas together for good relationships. | 4.33 | .41 | high |
| Listen to the opinions of others with respect and accept the opinions of the minority. | 4.19 | .33 | high |
| Use available resources wisely for team success | 4.05 | .73 | high |
| **Team Relations** | 4.05 | .59 | high |
| Learn and understand the character of your teammates to prevent conflicts. | 3.93 | .56 | high |
| Know how to adapt to team members when collaborating. | 4.19 | .50 | high |
| Trust team members to perform their assignments. | 3.88 | .58 | high |
| Be fair to all team members equally. | 4.21 | .48 | high |
| Be more open to collaborating with others than working with close friends. | 3.91 | .53 | high |
| Helps to coordinate the different ideas of members to avoid conflict. | 4.19 | .42 | high |
| Compliment your fellow team members when the work is successful as planned. | 4.01 | .53 | high |
| **Mean total** | 4.00 | .47 | high |

1.1) Responsibility: It was found that the ability to work as a team in relation to responsibility among Third-year prospective teachers averaged at a high level in all questions. The questions with the highest average were working together as a team member to the best of their abilities ($M$ = 4.21), followed by giving importance and dedication to teamwork. ($M$ = 4.09) and give importance to planning work and work according to the plan effectively ($M$ = 4.03), respectively. The questions with the lowest average were quick and coordinated team coordination ($M$ = 3.52).

1.2) Problem-solving ability: Data from the questionnaire showed that the teamwork ability of Third-year prospective teachers in terms of problem-solving abilities averaged at a high level in all questions. The questions with the highest average were providing information and feedback on collaboration ($M$=4.21), followed by improving how the team solved problems. When the problem cannot be solved with the original method ($M$ = 4.12) and offers creativity to analyse and solve teamwork

problems (*M* = 4.08), respectively. The questions with the lowest average were asked together with the team to make decisions and rationally choose solutions (*M* = 3.90).

1.3) Cooperation: It was found that the ability to work as a team in collaboration among Third-year prospective teachers averaged at a high level in all questions. The questions with the highest average were exchanges of ideas for good relationships (*M* = 4.33), followed by respectfully listening to the opinions of others and accepting the opinions of the minority (*M* = 4.19) and being willing to help and share knowledge, ideas, and experiences with teammates (*M* = 4.15), respectively. The questions with the lowest average were the distribution of leadership roles and communication among team members. Understand data and know progress (*M* = 3.66)

1.4) Team Relations: It was found that the ability to work as a team in team relations among Third-year prospective teachers averaged at a high level in all questions. The question with the highest average is fairness to all team members equally. (*M* = 4.21), followed by knowing how to adapt to team members when working together and helping to coordinate members' different ideas to avoid conflict (*M* =4.19) and compliment fellow team members when the work is successful as planned. (*M* = 4.01), respectively. The question with the lowest average was trust team members in their assignments. (*M* = 3.88)

Compare the teamwork abilities of early childhood prospective teachers who have learnt through creative drama activities to a 75% criterion.

**Table 2.** Comparison of average teamwork ability scores of early childhood education students who were taught using creative drama activities with a threshold of 75 percent.

| List | N | total | *Mean* | Std.Dev. | %of *M* | t | P-value |
|---|---|---|---|---|---|---|---|
| Teamwork ability scores | 54 | 140 | 112.18 | 19.92 | 80.13 | 2.52* | .00 |

*p<.05

It was found that the teamwork ability of early childhood education students who were managed learning using creative drama activities was statistically significantly higher than the 75% threshold at .01.

**Table 3.** Teamwork ability of 3rd year prospective teachers in Early Childhood Education, Faculty of Home Economics Technology, RMUTT separate by group working.

| List | Group 1 | Group 2 | Group 3 | Group 4 | Group 5 |
|---|---|---|---|---|---|
| Responsibility | 4.02 | 4.49 | 3.05 | 3.71 | 4.20 |
| Problem-solving ability | 4.23 | 4.56 | 3.25 | 3.94 | 4.27 |
| Cooperation | 4.20 | 4.48 | 3.27 | 3.75 | 4.40 |
| Team Relations | 4.20 | 4.53 | 3.22 | 3.79 | 4.49 |
| Mean | 4.16 | 4.52 | 3.20 | 3.80 | 4.34 |
| | highest | highest | moderate | high | highest |

When considering the teamwork ability of 3rd year prospective teachers in Early Childhood Education, Faculty of Home Economics Technology, RMUTT by group, it was found that the average teamwork ability score of students in group 1, group 2, and group 5 was the highest (*M* = 4.16, 4.52, and 4.34), followed by group 4 at a high level (*M* = 3.80) and group 3 at a moderate level (*M* = 3.20), respectively.

Students were shown to have two distinct sorts of teamwork characteristics: the first involved students conducting creative drama jointly at every step, while the second involved students with separate responsibilities for each phase.

1) Students working together on creative drama at every stage, including Group 1, Group 2, and Group 5. To begin with, everyone in the group must recognize and understand each step. Plan collaborations and review members' understanding before dispersing to work. For example, at the stage of writing a play, each person will separately research the plot of an interesting tale or piece of literature and then exchange information to choose an interesting story together. Provided that the story is rephrased from a more interesting story. Students cooperate in exchanging learning and solving problems that arise throughout the process. There is therefore no issue with the unjust division of labor because team

members are informed of the work's progress and the equitable division of labor at every step of the project. The bulk of the individuals in all three groups are already close, but new members have been added to enable them to collaborate, therefore sustaining connections within the team is a challenge. Initially, there was an adjustment issue, but everyone was able to collaborate face-to-face and communicate right away if they weren't happy. Students in the group reflected, "*I've never worked together, and the bigger this is, the more worried I am about whether my friends can work with us.*"

However, teamwork still struggles with appointments to work together and focus on teamwork as some members are far away from home and need to return early. As a result, the rest of the friends feel that they are not as dedicated to group work as they should be.

2) Students with separate responsibilities for each phase, including Groups 3 and Group 4. For example, in the playwriting stage, each group is divided into 2-3 people to write the play. Those in charge have been working on finding interesting plots. Present ideas and write plays according to the specified conditions. After that, it's up to another group of friends to create sets and props. As a result, each subgroup does not know the task at other stages, which results in a lack of understanding of collaboration and conflict because each subgroup will think that the work of the other group is easier and feel that their peers divide the work unevenly.

In terms of maintaining relationships within the team, both groups are formed by the union of several small groups of members, so they need time to learn habits and build mutual trust. In the beginning, the work was still well coordinated because each person was open to each other. But when they started to find problems at work, they started blaming each other back and forth. I don't want to work, even if the work is done, but the result is not as good as it should be.

The biggest problem that affects collaboration is communication without understanding. A student in the group reflected on the problem: "*Friends don't listen to their opinions*."

## DISCUSSION, CONCLUSION, and RECOMMENDATIONS

This study found that the teamwork ability of 3rd year prospective teachers in Early Childhood Education, Faculty of Home Economics Technology, RMUTT, was at a high level. In addition, when considering each aspect, it was found that the ability of students to work in all aspects of teamwork was also at a high level. Third-year prospective teachers in early childhood education can work in a team, but it has different work characteristics. The discussion can be summarised as follows:

1) Because they provide students with opportunities for engaging and collaborative experiences—both of which are essential for effective cooperation—creative drama exercises can help students develop their teamwork skills. These activities include role-playing, improvisation, and other creative strategies that encourage students to communicate and collaborate to reach a common goal. Through these experiences, students can acquire abilities like coordination, cooperation, problem-solving, and communication—all necessary for productive teamwork. Additionally, students can practice and improve these skills in a safe and encouraging environment through creative drama exercises, which can boost their confidence and increase their involvement in group situations. According to research, introducing creative drama activities into higher education courses can improve students' cooperation skills and benefit their overall growth. According to Zhao and Zhang (2021), incorporating creative drama activities into the curriculum can improve teamwork abilities among college students. Participating in these kinds of activities helped students show stronger levels of coordination, cooperation, and communication—all of which are essential for productive teamwork. Similarly, Li (2018) discovered that incorporating creative drama activities into the curriculum, such as role-playing, improvisation, and theatre games, can improve higher education students' teamwork abilities by promoting effective communication, active listening, cooperation, and problem-solving skills. These activities allow students to interact and work together in a fun and engaging way, which can help break down barriers and establish trust and mutual respect among team members. Moreover, self-awareness, empathy, and emotional intelligence—all essential for productive teamwork and leadership in the workplace—can be fostered in students through creative theater activities. Lee and Kim (2019) discovered that adopting drama-

based pedagogy in a communication course improved students' communication skills, self-efficacy, and teamwork abilities. Additionally, drama-based treatments in higher education were found to have a significant positive impact on students' social skills, emotional intelligence, and communication skills—all of which are critical elements of productive teamwork—by Wright, Stratton, and Borian (2016). These findings imply that introducing creative drama activities into the higher education curriculum can have numerous benefits for students' personal and professional growth.

2) The size of a group and the quality of relationships inside the group impact the team's capacity to collaborate effectively. The pupils' collaboration revealed that the group consisted of members from a few small groups. Groups with fewer subgroups exhibit superior teamwork compared to groups with a large number of members from subgroups due to their pre-existing tight relationships. This makes it easier and faster to build relationships in a group than with a group they've just worked with. O'Neill, McNeese, Barron and Schelble (2022) and Stevens and Campion (1994) support the idea that team size can affect teamwork. Though smaller teams might be more cohesive, have a stronger feeling of shared responsibility, and be better at problem-solving activities than bigger teams, larger teams might have advantages in terms of human resources, division of labor, and idea-generation duties. Thus, the optimal team size may vary depending on the type of task and the goals of the team. Gaunt et al. (2019) found that team members who reported higher levels of intimacy and familiarity with one another were more likely to demonstrate effective teamwork, including higher levels of cooperation, communication, and shared decision-making. O'Neill and Lambert (2014), Henningsen and Henningsen (2009), Bächtold et al. (2023) suggested that dividing students into functional groups based on their individual abilities can promote a more equal distribution of tasks and responsibilities, leading to greater engagement and participation among all members. Some groups may be members who are close friends, and when working together, they will be happy and work effectively together. It could be difficult for a group with distant members to accept one another's viewpoints during an explanation session, thus there should be a procedure for practicing working with others. Carvalho and Gomes (2018) state that good interactions, teamwork, helping each other achieve goals, and trusting in each other's abilities are the foundations of a collaborative workplace. Therefore, embracing the opinions of others and daring to express one's opinions with colleagues can increase the likelihood of collaboration. (Wang & Chen, 2017).

3) The study found that the ability to coordinate teams quickly and effectively was the weakest skill among students in the early stages of teamwork. Many students did not interact with the group, ignored messages sent to group chats, or read them but did not respond. To address this, students could be encouraged to divide tasks among themselves and arrange to communicate after school instead of relying solely on online communication. Research from DeRosa, Lepsinger, and Lepsinger (2010), Goñi et al. (2020), Kahlow et al. (2020), Staggers et al. (2008), Smith et al. (2011), and Tsai and Huang (2019) have shown that there can be a significant difference in teamwork abilities between face-to-face and online communication. When compared to students who communicated solely online, those who communicated face-to-face had higher levels of mutual understanding, trust, and collaboration, resulting in better teamwork outcomes. Face-to-face communication enabled team members to create trust, build rapport, and address conflicts more quickly, all of which are critical components of good teamwork.

**Recommendations**

Possible future studies can compare the level of cooperation between students majoring in early childhood education who take part in creative drama activities and those who do not. To assess the relative effectiveness of these activities in developing cooperation skills, randomized controlled trials or quasi-experimental designs could be utilized. Investigating the viewpoints and experiences of student early childhood educators participating in creative drama activities could also be achieved using qualitative research methodologies, including participant observation, focus groups, or interviews. The ways in which these exercises improve participants' ability to work together and the challenges they encountered could be better understood with the use of qualitative research.

**Limitations**
The sample size used in this research is small. Research results may not be applicable to broader populations when conducted with small samples since these populations may not be representative of the sample in question.

**Ethics and Conflict of Interest**
The authors declare that the study has not unethical issues and that research and publication ethics have been considered carefully. The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Author Contributions**
All authors' contributions to the article are equal in every aspect. All authors have read and agreed to the published version of this work.

**Corresponding Author**
Correspondence to Wanitcha SITTIPON, wanitcha_s@rmutt.ac.th

## REFERENCES

Bächtold, M., Roca, P., & De Checchi, K. (2023). Students' beliefs and attitudes towards cooperative learning, and their relationship to motivation and approach to learning. *Studies in Higher Education, 48*(1), 100-112.

Bolin, P. E. (2017). English language teaching through drama: A review of current practices. *English Language Teaching, 10*(8), 68-77. https://doi.org/10.5539/elt.v10n8p68

Briones, E., Gallego, T., & Palomera, R. (2022). Creative Drama and Forum Theatre in initial teacher education: Fostering students' empathy and awareness of professional conflicts. *Teaching and Teacher Education, 117*, 103809.

Burdette, H. L., & Whitaker, R. C. (2005). Resurrecting free play in young children: Looking beyond fitness and fatness to attention, affiliation, and affect. *Archives of Pediatrics & Adolescent Medicine, 159*(1), 46-50. https://doi.org/10.1001/archpedi.159.1.46

Carvalho, J. A., & Gomes, D. J. (2018). The role of communication and trust in promoting teamwork: A qualitative analysis. *Journal of Management & Organization, 24*(4), 505-519.

DeRosa, D. M., Lepsinger, R., & Lepsinger, S. (2010). *Virtual team success: A practical guide for working and leading from a distance.* John Wiley & Sons.

Gaunt, H., Halliwell, E., Ditton, H., Sheikh, S., & Gao, Y. (2019). Creativity, emotion regulation, and mental health: A systematic review of creative interventions for individuals at risk of developing mental health disorders. *Journal of psychiatric research, 111*, 74-85.

Goldstein, T. R. (2009). The role of the arts in improving cognitive function as we age. *Generations, 33*(1), 16-22.

Goncalves, G., & de Souza, L. K. (2021). Understanding and managing conflicts in the workplace: A literature review. *Psicologia: Reflexão e Crítica, 34*(1), 1-11. https://doi.org/10.1186/s41155-020-00185-2

Goñi, J., Cortázar, C., Alvares, D., Donoso, U., & Miranda, C. (2020). Is teamwork different online versus face-to-face? A case in engineering education. *Sustainability. 12*(24),10444. https://doi.org/10.3390/su122410444

Hartel, C. E. J., Fujimoto, Y., Strybosch, V. E., & Fitzpatrick, M. (2019). *Teamwork in the 21st century: Theories, tools, and trends.* Cham: Springer.

Henningsen, D. D., & Henningsen, M. L. (2009). Acting skills and empathic inference. *Journal of Applied Social Psychology, 39*(6), 1306-1325.

Johnson, D. W., & Johnson, R. T. (2014). Cooperative learning and academic achievement: Why does groupwork work? In R. M. Gillies (Ed.), *Pedagogy: New Developments in the Learning Sciences* (pp. 1-28). Springer.

Johnson, L., & Russell, B. (2014). "Let's pretend we're on a sinking ship": Creative drama as a tool for developing collaboration and teamwork. *International Journal of Education & the Arts, 15*(10), 1-23.

Kahlow, J., Klecka, H., & Ruppel, E. (2020). What the differences in conflict between online and face-to-face work groups mean for hybrid groups: A state-of-the-art review. *Review of Communication Research, 8*, 51-77. Retrieved from https://www.rcommunicationr.org/index.php/rcr/article/view/53

Kao, H. (2018). The effects of improvisational drama-based pedagogy on EFL learners' communication skills. *Journal of Education and Practice, 9*(18), 68-75.

Katzenbach, J. R., & Smith, D. K. (2008). *The discipline of teams.* Harvard Business Press.

Lee, K. J., & Kim, M. (2019). The effects of a theater program on social skills development in children with autism spectrum disorder. International Journal of Disability, *Development and Education*, *66*(6), 684-701.

Li, J. (2018). Exploring the effects of drama-based English language teaching on Chinese college students' English speaking anxiety and speaking performance. *Journal of Language and Linguistic Studies, 14*(1), 124-140.

Manalo, E. (2019). The effectiveness of drama activities in teaching English language learners. *Journal of Education and Practice, 10*(30), 47-52. https://www.iiste.org/Journals/index.php/JEP/article/view/49721/51448

O'Neill, C., & Lambert, A. (2014). *Drama structures: A practical handbook for teachers*. National Drama.

O'Neill, T., McNeese, N., Barron, A., & Schelble, B. (2022). Human–autonomy teaming: A review and analysis of the empirical literature. *Human factors*, *64*(5), 904-938.

Pellegrini, A. D., & Smith, P. K. (1998). Physical activity play: The nature and function of a neglected aspect of play. *Child Development, 69*(3), 577-598. https://doi.org/10.1111/j.1467-8624.1998.tb06161.x

Ruangwitoo, A. (2021). The relationship between teamwork skills and critical thinking skills of fourth-year students at Suan Sunandha Rajabhat University. *Journal of Industrial Education, 20*(2), 155-165.

Sawangchareon, K., Sanguansak, N., Lertlop, W., & Jaitang, P. (2021). Creative drama activities as an effective tool for English language teaching. *Journal of International Studies, 11*(1), 110-118.

Schneider, E. F., Lang, A., Shin, M., & Bradley, S. D. (2004). Death with a story: How story impacts emotional, motivational, and physiological responses to first-person shooter video games. *Human Communication Research, 30*(3), 361-375. https://doi.org/10.1111/j.1468-2958.2004.tb00743.x

Smith, G. G., Sorensen, C., Gump, A., Heindel, A. J., Caris, M., & Martinez, C. D. (2011). Overcoming student resistance to group work: Online versus face-to-face. *The Internet and Higher Education, 14*(2), 121-128. https://doi.org/10.1016/j.iheduc.2010.09.005

Staggers, N., Gassert, C. A., & Curran, C. (2008). A Delphi study to determine informatics competencies for nurses at four levels of practice. *Nursing Research, 57*(2), 85-98.

Stevens, M. J., & Campion, M. A. (1994). The knowledge, skill, and ability requirements for teamwork: Implications for human resource management. *Journal of Management, 20*(2), 503-530.

Tang, K. N. (2020). The importance of soft skills acquisition by teachers in higher education institutions. *Kasetsart Journal of Social Sciences, 41*(1), 22-27.

The Secretariat of the Education Council. (2017). *Education in Thailand.* Retrieved from https://www.seameo.org/SEAMEOWeb2/index.php?option=com_content&view=article&id=669&Itemid=727&lang=en

Tsai, C. Y., & Huang, I. A. (2019). Exploring the factors affecting teamwork effectiveness in engineering education. *International Journal of Engineering Education, 35*(3), 807-819.

UNESCO (2021). *COVID-19 Impact on education.* Retrieved from https://en.unesco.org/covid19/educationresponse

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wang, M., & Chen, C. C. (2017). A social interaction perspective on turnover intention: The role of social support and trust in coworkers. *Human Resource Management Review, 27*(4), 647-660.

Woolf, B. P., & Woolf, J. A. (2016). Team-based learning: A practical guide: AMEE Guide No. 65. *Medical Teacher, 38*(5), 414-423. https://doi.org/10.3109/0142159x.2016.1148857

World Economic Forum. (2020). *The future of jobs report 2020*. Retrieved from https://www.weforum.org/reports/the-future-of-jobs-report-2020

Wright, S., Stratton, J., & Borian, F. (2016). The impact of drama-based interventions on college students' social skills, emotional intelligence, and empathy: A meta-analysis. *Journal of Creativity in Mental Health, 11*(2), 184-205. https://doi.org/10.1080/15401383.2016.1167829

Zhao, X., Chen, L., & Zhang, Z. (2021). Creative drama activities promote the development of college students' teamwork abilities. *Journal of Education and Practice, 12*(7), 95-103.

**About the authors:**

**Wanitcha SITTIPON**
Wanitcha SITTIPON received a Ph.D. in early childhood education from Chulalongkorn University, Thailand. Currently, she is a lecturer in early childhood education at the Faculty of Home Economics Technology, Rajamangala University of Technology Thanyaburi, Thailand. Her research focuses on professional development for early childhood teachers and child development.

**Pornsiri SANTUM**
Pornsiri SANTUM received an M.Ed. degree in early childhood education from Phranakhon Rajabhat University, Thailand. Currently, she is a lecturer in early childhood education at the Faculty of Home Economics Technology, Rajamangala University of Technology Thanyaburi, Thailand. Her research focuses on music and movement for young children and parent education.

**Praditha PARSAPRATET**
Praditha PARSAPRATET received a Ph.D. in early childhood education from Srinakharinwirot University, Thailand. Currently, she is an assistant professor in early childhood education at the Faculty of Home Economics Technology, Rajamangala University of Technology Thanyaburi, Thailand. Her research interests include young children's development and learning, health and well-being for young children, and parenting style.

IOJPE

IOJPE

ISSN: 1300 – 915X
www.iojpe.org

*International Online Journal of Primary Education* *2024, volume 13, issue 1*

# MACHINE LEARNING FOR ENHANCED CLASSROOM HOMOGENEITY IN PRIMARY EDUCATION

Faruk BULUT
Associate Professor, Istanbul Esenyurt University, İstanbul, Türkiye
ORCID: https://orcid.org/0000-0003-2960-8725
farukbulut@esenyurt.edu.tr

İlknur DÖNMEZ
Senior Researcher, Turkish Scientific and Technical Research Council, Gebze, Türkiye
ORCID: https://orcid.org/0000-0002-8344-1180
ilknur.donmez@tubitak.edu.tr

İbrahim Furkan İNCE
Assistant Professor, Istanbul Nişantaşı University, İstanbul, Türkiye
ORCID: https://orcid.org/0000-0003-1570-875X
ibrahim.ince@nisantasi.edu.tr

Pavel PETROV
Associate Professor, University of Economics - Varna, Bulgaria
ORCID: https://orcid.org/0000-0002-1284-2606
petrov@ue-varna.bg

**Received:** November 13, 2023 **Accepted:** March 08, 2024 **Published:** March 31, 2024

**Suggested Citation:**
Bulut, F., Dönmez, İ., İnce, İ. F., & Petrov, P. (2024). Machine learning for enhanced classroom homogeneity in primary education. *International Online Journal of Primary Education (IOJPE), 13*(1), 33-52. https://doi.org/10.55020/iojpe.1390421

This is an open access article under the CC BY 4.0 license.

**Abstract**

A homogeneous distribution of students in a class is accepted as a key factor for overall success in primary education. A class of students with similar attributes normally increases academic success. It is also a fact that general academic success might be lower in some classes where students have different intelligence and academic levels. In this study, a class distribution model is proposed by using some data science algorithms over a small number of students' dataset. With unsupervised and semi-supervised learning methods in machine learning and data mining, a group of students is equally distributed to classes, taking into account some criteria. This model divides a group of students into clusters by the considering students' different qualitative and quantitative characteristics. A draft study is carried out by predicting the effectiveness and efficiency of the presented approaches. In addition, some process elements such as quantitative and qualitative characteristics of a student, data acquisition style, digitalization of attributes, and creating a future prediction are also included in this study. Satisfactory and promising experimental results are received using a set of algorithms over collected datasets for classroom scenarios. As expected, a clear and concrete evaluation between balanced and unbalanced class distributions cannot be performed since these two scenarios for the class distributions cannot be applicable at the same time.

**Keywords:** Unsupervised and semi-supervised methods, class distribution, classroom homogeneity, ability grouping, similar academic performance.

## INTRODUCTION

One of the key elements that is thought to promote overall success is the establishment of uniform classes at all educational levels, from kindergarten to university classes (Yoleri et al., 2022). Especially in primary and secondary school years, educators rather than parents have enough experienced that this kind of class grouping among students is better (Gabaldón-Estevan, 2020). As it is known, students, parents, and teachers who support the idea that classes should be homogeneous are in the majority compared to those who have other ideas. This argument is not only in Turkey but also in many countries (Bosworth, 2014).

The concept of homogeneity in a school classroom essentially depends on different criteria. When examining a class in terms of a certain set of criteria, it may have an equal distribution of students in some respects. However, in terms of other criteria, the class might be considered heterogeneous.

Especially in primary schools, an unbalanced class distribution can hinder both total and individual success from reaching expected levels. It is a fact that homogeneous distributions enhance both individual and overall achievement during the primary school years (Rivkin et al., 2015). In today's conditions, class distributions may become unbalanced and heterogeneous for several reasons, including random assignment of students to classes, preferences for certain teachers, personal discretion in class assignment, or the influence of requests from powerful individuals. In such cases, while the majority of students in the same class may experience rapid and lasting learning, another segment may struggle to reach the average (Gabaldón-Estevan, 2020; Rivkin et al., 2015). This discrepancy can lead to various psychological issues among students who fall behind.

One common issue among primary school teachers is managing classes that include students with contrasting characteristics, such as hardworking versus lazy, willing versus unwilling, distracted versus attentive, and interested versus indifferent. Especially in elementary school, the idea is to design the best possible class distribution that puts students in similar groups based on their qualifications in order to maximize each student's academic performance. In such heterogeneous classes, while one group of students may achieve high academic success, another may not meet the expected levels of success (Koray et al., 2003).

Additionally, there is a widespread belief among both students and parents in Turkey that being in a "good" class is necessary to excel in national university entrance exams, high school entrance exams, and TÜBİTAK National Science Olympiad exams. It is thought that a student surrounded by more hardworking peers will be motivated to work harder by example. Here, the term "good class" is essentially synonymous with a "homogeneous class" (Gabaldón-Estevan, 2020).

In both sports clubs and educational courses, there is a beneficial practice of classifying individuals into homogeneous groups based on similar physical characteristics, ages, and skill levels. For instance, while most athletes can withstand heavy and high-level training, others may not, highlighting the need for such classification. Similarly, in foreign language courses, forming groups based on language proficiency leads to faster learning outcomes. This approach also applies to activities requiring specific talents or even in patterns of social behavior. These scenarios underscore the importance of creating groups comprised of individuals with similar quantitative and qualitative characteristics, such as learning abilities, levels of different types of intelligence, and demographic factors. By taking into account the unique requirements and talents of each group, the goal is to increase the overall efficacy of training or educational programs. (Gabaldón-Estevan et al., 2014; Rivkin et al., 2015).

It has been observed that machine learning algorithms, including Classification, Clustering, and Association, are not widely applied in fields such as classroom organization or in enhancing overall student achievement, especially in contexts with limited data (Alpaydin, 2021; Bacos, 2020). This observation suggests a potential area for the application of these algorithms beyond their current use, highlighting the opportunity to leverage machine learning techniques in educational settings to improve outcomes.

This study explores the effects of classroom composition on student learning and academic performance, weighing the benefits of forming either homogeneous or heterogeneous classes. While achieving perfectly uniform conditions might be challenging, there is a contention that homogeneous classrooms can enhance both collective and individual student success. The underlying premise is that classes comprised of students with similar capabilities tend to outperform others, which forms the basis of this investigation. Additionally, the study aims to lay the groundwork for utilizing unsupervised learning techniques from disciplines such as Machine Learning, Data Mining, and Pattern Recognition to devise class distributions. It offers an introductory framework for class formation employing these methods, underscoring their utility across various data science fields. The study's theoretical foundation is rooted

in data science, with a specific focus on classification and clustering methods, suggesting these as effective tools for improving educational outcomes.

Creating a dataset that encompasses both qualitative and quantitative student data is a task that demands considerable time and effort. Furthermore, several preparatory actions are necessary before data collection can commence. These include choosing suitable survey questions, securing ethics committee approval, and obtaining the requisite official permissions. Once these initial preparations are finalized, the methodology progresses to further stages, such as visiting educational institutions to collect data, processing the gathered data, integrating and fine-tuning an artificial prediction model, analyzing the resulting outputs, refining the model based on feedback, and assessing the system's reliability and performance. It is inevitable that the dataset produced through such processes may not be as extensive as desired. Consequently, the objective is to generate the most accurate predictions and viable hypotheses to inform educational strategies, even with limited data. The primary goal of this research is not to create a universal hypothesis for the entire country using minimal data but rather to elucidate the development of a predictive model through a scientific publication. Introducing a dataset that combines both real-world and synthetic data, and providing a foundational framework in this area serves an initial step towards future developments.

Following a thorough review of the existing literature, no original models relevant to the specific theme of this study were identified, which precludes the possibility of conducting a comparative analysis. Therefore, the framework introduced in this document should be considered a preliminary model. This initial model aims to ensure homogeneity in class distributions, thereby creating environments more conducive to academic achievement. As discussed in the introductory section, foundational concepts and hypotheses related to the topic are presented. Subsequent sections delve into relevant academic research within this domain, followed by an exploration of the necessary methodologies and steps for creating a dataset. Upon completing these analyses, the final section provides a conclusion based on the conducted evaluations.

**Literature review**

Discussions on the categorization of students based on various criteria have been prevalent since the 20th century, notably intensifying in the 1950s, as highlighted by (Lebedina-Manzoni, 2004). These discussions revolve around the optimal methods for segregating or organizing primary students within educational settings, employing diverse criteria to improve educational outcomes and address the needs of a diverse student body. Key perspectives in these debates include:

- Academic Performance: Grouping students according to their grades or test scores.
- Individual Abilities: Organizing students based on their assessed intellectual or skill-based capabilities.
- Cultural Backgrounds: Considering the impact of students' cultural contexts on their academic achievements and educational needs.

These criteria represent the core considerations in academic and pedagogical discussions regarding the most effective strategies for arranging students into classes or groups.

Research in this field varies, with some scholars emphasizing the importance of academic performance for student segregation, while others focus on sorting students by their abilities (Kuh et al., 2006). It highlights the significant impact of cultural backgrounds on students' academic success (Filatova, 2015). Additionally, Mulkey et al. (2005) posited that homogeneous groupings of students provide sustained academic benefits over time.

The examination of ability-based student categorization within educational research has yielded inconsistent and sometimes conflicting outcomes. Investigations into the efficacy of segregating students into groups or classes according to their abilities or skill levels have not produced uniform findings. Specifically, whereas certain investigations highlight the advantages or positive effects of ability grouping, others point out its disadvantages, challenges, or lack of significant impact, thus

sparking a debate and resulting in a lack of consensus regarding the strategy's effectiveness. The disparate results from such studies can be attributed to various factors, including the number of classes involved, the implemented curriculum, available resources, students' socioeconomic backgrounds, the size of the educational institution, and the degree of homogeneity among the student population. Consequently, due to the variability in research outcomes, a comprehensive analysis of the contextual and foundational aspects of these studies is crucial.

Considering formal educational institutions, the notion of homogeneous classes can be segmented into primary, secondary, and tertiary levels. While these groups may be delineated based on success metrics, alternative classification criteria also apply (Yoleri, 2014). Additionally, Yoleri et al. (2013) explored factors influencing the academic integration and achievement of first-year primary students.

Gifted students and their families have shown a preference for homogeneous classes in terms of academic success, underscoring the importance of aligning educational environments with individual capabilities (Adams-Byers et al., 2004). This preference highlights the necessity for distinct evaluations across various subjects, particularly noting the significance of specialized assessments in mathematics (Oakes et al., 1995). Despite this, proponents of mixed class distribution argue for a more egalitarian approach, suggesting that segregating students based on cognitive abilities can detrimentally impact their social and psychological well-being (Hallam et al., 2001; Hodum, 2016).

Achieving true homogeneity within a classroom setting is challenged by a multitude of variables, including socioeconomic factors, individual student characteristics, and external environmental factors, all of which contribute to the inherent heterogeneity of any educational group (Hodum, J., 2016). This complexity implies that striving for homogeneity, while beneficial in certain aspects, must be balanced with the recognition of the value that diverse educational experiences bring to the learning environment.

The perspective among educators often leans towards favoring homogeneous groupings, with the argument that lesson difficulty should be adapted to match the collective level of the class, thereby optimizing the learning experience (Çelenk, 2008). Empirical studies have reinforced the notion that homogeneous class distributions can significantly influence class success, suggesting a correlation between group homogeneity and academic performance (Lu et al., 2015). Yet, the literature also acknowledges the dual-edged nature of homogeneous versus heterogeneous structures, each presenting distinct advantages and challenges to educational outcomes (Schullery et al., 2006).

Comparative analyses of student attitudes and perceptions in homogeneous and heterogeneous classes reveal that, while inclusive and mixed groupings are advocated as beneficial for most students, homogeneous settings can specifically cater to the needs of academically gifted students without compromising the educational experience of others in mixed settings (Shields, CM, 1995). This suggests a nuanced understanding of classroom composition and its impact on student engagement and achievement.

Studies looking into the wider effects of class composition on academic success and student socialization have been conducted in addition to ongoing research into flexible grouping as a classroom management strategy in heterogeneous classes (Rytivaara, 2011). (Gabaldon-Estevan, 2020). These studies contribute to the ongoing dialogue regarding the optimal balance between homogeneity and heterogeneity in educational settings, examining factors such as age, gender, ethnicity, and disability, and their influence on classroom interactions and learning outcomes.

Innovative approaches to group formation in active learning environments have also been scrutinized, with research indicating that heterogeneous groups may exhibit superior learning outcomes in certain contexts, such as physics courses, suggesting that diversity within academic groups can enhance the learning process (Briggs, 2020). Concurrently, the efficacy of cooperative learning methods in both homogeneous and heterogeneous class distributions has been examined, revealing that the strategic grouping of students can leverage the benefits of peer learning, although the results are varied and context-dependent (Wyman et al., 2020).

Internationally, research in Malaysia has aimed to identify suitable clustering models for the analysis of educational data. The goal is to align student academic pathways with national interests and to refine educational strategies based on student performance data (Salwana et al., 2017). This research highlights the intricate relationship between classroom composition, educational strategies, and academic outcomes, emphasizing the significance of a nuanced approach to student grouping and instructional design in meeting educational goals.

In summary, educational leveling serves dual purposes: safeguarding the interests of diligent, high-performing students and enhancing the academic success of those with lower performance levels. The practice of mixing students with high academic potential into groups of average-performing students proves ineffective. Furthermore, placing students with certain inherent traits alongside peers who achieve at higher levels can lead to a decline in their self-esteem.

Drawing on scientific research, a method was developed that employs data science clustering algorithms to organize classroom groups. This approach is based on the assumption that grouping students into homogeneous classes is beneficial.

## METHOD

### Research Model

In a data set where there are samples without a class label and with certain attributes, the samples can be separated into different clusters. In the literature, this process is also called clustering and is referred to under the heading of unsupervised learning. There is no supervisory mechanism based on the class label. Finding the class label in the samples and finding which class the new test samples will belong to is called classification and is also referred to as supervised or supervised learning in the literature. The defining element here is the class label. On the other hand, the process of separating a small number of labeled samples and a large number of unlabeled samples into certain classes or clusters is called semi-supervised learning (Taghizabet et al., 2023).

Almost all of the academic and practical studies with data science in the field of education have been carried out with supervised learning methods (Holmes et al., 2019). Unlike other studies, the general structure of unsupervised learning techniques and the details of how they will be used in the subject we are working on will be discussed. First, how to create a data set, what the preliminary preparations are and how to make it ready for use will be discussed.

### Design of the study

The flow chart in Figure 1 summarizes and presents the artificial decision system. It starts with defining the problem, followed by data collection, data processing, model building and fitting, and running clustering methods. The ultimate goal is to create a hypothesis and gain the necessary wisdom.

The process described transforms raw data into information using statistical and machine learning algorithms. This information then becomes knowledge through data science algorithms. Finally, wisdom is derived from this knowledge, summarizing the data science and wisdom discovery stages as illustrated in Figure 2. The DIKW Hierarchy is a model that represents the transformation of data into wisdom through various stages:

1. Data : Raw or unprocessed data.
2. Information : Processed, organized, or structured data to provide context and meaning.
3. Knowledge : Processed, analyzed, understood information for decision-making.
4. Wisdom : The highest level, where knowledge there are experience and judgment to make informed decisions.

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

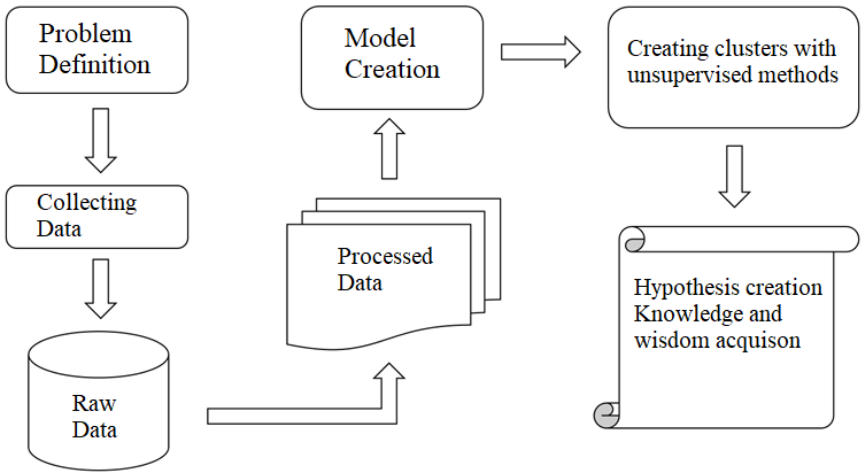


**Figure 1.** Flow chart of the study.

In Figure 2 (b), the Life Cycle of Data refers to the processes through which data is collected, processed, analyzed, and disposed of or archived.

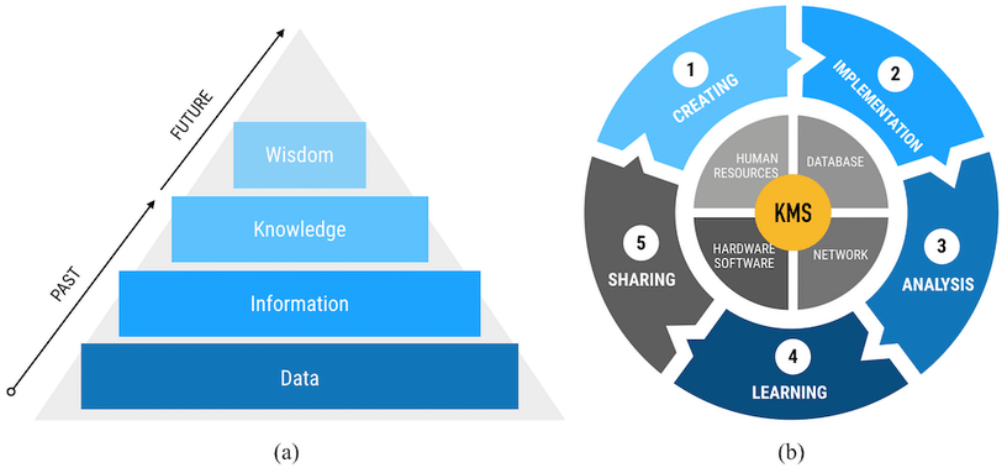


**Figure 2.** Data analytics pyramid of Data-Information-Knowledge-Wisdom (DIKW).

The process in data science normally begins with raw data, comprising numbers, characters, and symbols. From this, relational information and patterns are discerned. This leads to the formulation of solutions and hypotheses for existing problems. Ultimately, the entire process is evaluated from a broad perspective, utilizing human intelligence and understanding to derive insights and experiences that illuminate future paths.

**Data collection and process management**

The data obtained in this study has been made with official permissions and authorizations. A survey has been conducted with the students at the TOKİ Karşıyaka Municipality Primary School, under the permission document numbered 15585669-604.01.02-E.3979850 and dated April 8, 2016. As outlined on the website (Website, 2024), the primary instrument for data collection was a carefully designed survey, ensuring the gathering of pertinent and valuable information. The data collection involved ten first-grade students, proceeding with explicit consent from their parents and under the meticulous supervision and support of their classroom teacher. Data collection was conducted on 12 first-grade primary students in 2016. Eight boys, all seven years old, were among the students; they were all in good health and did not have any mental or physical problems.

As it is known, collecting data from primary students is a very difficult process. Therefore, to address this challenge, the collected data were resampled by using a specific algorithm (Bulut, 2020) to create a sufficient dataset comprising 24 individuals of both real and synthetic data. Therefore, this number is known to be equivalent to the population size of a typical classroom.

To evaluate the success of this study, an analysis of academic performance was conducted, comparing achievements at the conclusion of both the first and second academic terms. As a data collection tool, the survey questions specified on the website (Website, 2024) were applied to the students. The academic achievements of the students at the end of the fall and spring semesters were evaluated according to the data science criteria specified in the article in order to obtain experimental results.

**Optimal attribute selection of students**

Effective classroom grouping hinges on the identification of pertinent student characteristics, necessitating data collection from educators, psychologists, students, and parents. This comprehensive approach affords a detailed insight into the dynamics of classroom composition. Additionally, evaluating students' academic and extracurricular achievements, alongside personal attributes like sociability and self-confidence, offers a holistic gauge of academic success. Critically, evaluations must avoid discriminatory factors to maintain fairness in the assessment process. Within the field of artificial intelligence, the success of an application greatly depends on the quality and relevance of the selected features. A thorough examination of existing literature has pinpointed the principal factors that directly or indirectly affect educational and training outcomes:

- Turkish course success (out of 5)
- Mathematics course success (out of 5)
- Science course success (out of 5)
- English course success (out of 5)
- Visual Arts course success (out of 5)
- Music course success (out of 5)
- Physical Activities course success (out of 5)
- Does he/she have learning difficulties? (Y/N)
- Does he/she like to do sports? (Y/N)
- Does he/she have a habit of doing homework? (Y/N)
- Does he/she have a habit of reading books? (Y/N)
- Does he/she play a musical instrument? (Y/N)
- Could he/she be class president (representative)? (Y/N)
- Is he/she inquisitive? (Y/N)
- Does this person have social characteristics? (Y/N)
- Does he/she like to share? (Y/N)
- Does he/she have self-confidence? (Y/N)
- Are his/her parents together? (Y/N)

Prior to initiating data science processes, it is crucial to digitize responses for inclusion in the dataset, incorporating observational information as needed. Maintaining ethical standards in data gathering requires both getting ethics committee approval and making sure the questions respect individual rights and freedoms.

**Dataset preparation procedure**

Accurate quantification of attributes is crucial for data clustering. While binary questions are usually coded as 1 or 0, academic performance can be represented by integers on a scale of 4, 5, or 100, and rational numbers can also be used. Answers to multiple choice questions are coded as nominal or categorical values such as "a", "b", "c". Clustering and classification techniques make use of algorithms designed to handle these nominal values efficiently, streamlining the process without complications. All of the numbers in the created training set can be integer, real number and nominal types. All nominal

data must first be converted to numeric values with the "nominal_to_binary" method. In this way, both clustering algorithms can be tested in the system, and the performance of these algorithms is increased. During data collection, unanswered questions lead to missing values, a significant issue. The literature suggests various methods to estimate and fill these gaps to maintain data integrity (Zhu et al., 2010). Numerical data should be normalized to a [0, 1] range, especially when it spans a wide scale, to improve clustering method performance (Bulut, 2016), (Bulut et al., 2016). The Min-Max and Z-Score normalization techniques are recommended to address irregular distributions and potential data issues (Jayalakshmi et al., 2011). Multidimensional datasets often become sparse as the number of features increases, which can negatively impact clustering success. To address this, increasing the sample size or using dimensionality reduction algorithms like Principal Component Analysis, Linear Discriminant Analysis, Factor Analysis, t-SNE, and others can help reduce dimensions and improve data density (Gao et al., 2021; Wang et al., 2021; Mair, 2018; Xiao et al., 2023; Groth et al., 2013). Before creating a hypothesis, it is critical to evaluate the impact of each feature on cluster results using methods such as information retrieval. Removing low-impact features can increase dataset density and improve clustering results. This approach, which involves eliminating unnecessary dimensions and outliers, leads to improved data usage for analysis. The study examined traits based on their distribution to achieve cumulative success (Zhang et al., 2003).

**Analysis of data**

The data analysis process is critical in transforming raw data into meaningful insights through a structured approach that includes data preprocessing, application of machine learning algorithms, and the evaluation of results.

Data preprocessing is the first step that involves cleaning and normalizing the data to ensure it is suitable for further studies. This phase lays a solid foundation for applying machine learning algorithms by addressing issues such as missing values, outliers, and data format inconsistencies.

The cleaned data is then analyzed using various machine learning algorithms facilitated by programming languages such as Python and MATLAB. This study focuses on classification, clustering, and semi-supervised learning techniques. In particular, the clustering algorithms include k-means, Hierarchical clustering, Self-Organizing Maps (SOM), Density-Based Spatial Clustering of Applications with Noise (DBSCAN), and Clustering with Voronoi Diagrams. Each algorithm is selected for its ability to uncover patterns and groupings within data that align with research objectives.

The results of these algorithms are critically evaluated to evaluate their performance and effectiveness. For example, clustering algorithms are evaluated on their ability to form consistent and meaningful clusters using metrics such as silhouette scores. The evaluation phase is crucial to interpreting the data in light of the objectives of the study and allowing meaningful conclusions to be drawn that will contribute to the broader field of data analysis and machine learning.

## EXPERIMENTAL RESULTS AND FINDINGS

**Normally distributed features**

Many phenomena in nature show a normal distribution. As seen in Figure 3, the bar graph is in the form of a Gaussian curve, that is, a bell curve. The success of the students in a class in a lesson is explained with this graphic. It can be observed that unsuccessful and very successful students are in the minority, while those with normal success are in the majority. In Figure 3, the numbers in the *x* axis [0, 100] indicate students' academic achievement; the *y* axis shows the frequency status.

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

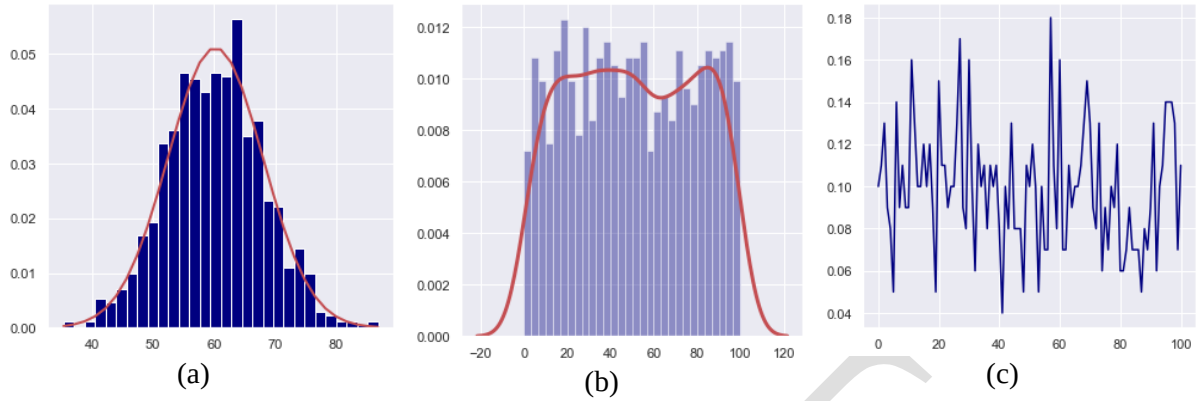


**Figure 3. (a)** Histogram of the Gaussian (normal) distribution, **(b)** Histogram of the uniform distribution, **(c)** Histogram of random distribution, and the *x*-axis is the student course success average.

**Uniformly distributed features**

The uniform distribution gets its name from the fact that the probabilities for all outcomes are approximately the same. The probability of each outcome occurring is almost equal. Here, the mean and median values are almost the same. Because every outcome in a single distribution occurs at the same relative frequency, the resulting shape of the distribution is almost the shape of a rectangle. As can be seen in Figure 3 (b), the distribution related to student course success is uniform. The number of students in almost every success category is the same. The class with this type of distribution is heterogeneous and is undesirable for educators. In the dataset, there is a distribution suitable for a uniform distribution in some attributes.

**Randomly distributed features**

In this type of distribution, as seen in Figure 3 (c), it is the case that the attributes of each student exhibit a different distribution and cannot be evaluated within a certain distribution type. These features do not contribute to the success of the clustering algorithm. In other words, they behave somewhat like noise, making it difficult to find similar clusters.

**Clustering Methods**

Within the realms of Machine Learning, Data Mining, and Pattern Recognition, algorithms designed for classification, prediction, clustering, and association tasks are employed to achieve a uniform distribution of students and can also be utilized to ascertain grade levels. Unsupervised clustering algorithms enable grouping without adherence to predefined conditions or rules (Ian et al., 2005). The clustering process relies solely on the inherent functionality of the chosen algorithm. These unsupervised algorithms are broadly categorized into four principal domains:

1. Divisional methods: For example, k-Means (Xiao et al., 2018) and k-Medoids (Kaufman et al., 2009) methods.
2. Hierarchical methods: Agglomerative Clustering as an example (Han et al., 2023).
3. Density-based methods: For example, Density-based spatial clustering of applications with noise method (Sheridan et al., 2020).
4. Model-based methods: For example, Gaussian Mixture Model Expectation Maximization (Xie et al., 2023), Self-organizing map (SOM) or self-organizing feature map (Motegi et al., 2023) methods can be given.

These frequently used clustering methods show differences when compared to each other in terms of characteristics. These methods are used to detect hidden patterns and structures in a data set. In our study, it is predicted that density-based clustering methods will give more successful results than others will in order to create the most appropriate cluster. Because students with similar characteristics are

concentrated in certain regions of the data set, it would be more appropriate to evaluate those regions as a group.

Comparison of the level of success achieved because of placing students in the most appropriate classes with the clustering process can be done in three ways:

1. With analytical criteria defined in the literature (Backer et al., 1981).
2. With the objective exam results obtained from the courses.
3. With the subjective confirmation of educators and parents working in the relevant educational institution.

**_k_-means method**

This algorithm is the most efficient and accurate bundling method known. For a *k* value known as a parameter, the k-means bundling algorithm has 4 basic steps:

1. The dataset is divided into *k* subsets according to their proximity to *k* randomly determined points. Each tuple is treated as a subset. The *k* parameter here is essentially the number of classes planned to be created.
2. The average of each new bundle created according to the selected centers is calculated, and the center point is found (the average of the attributes of the objects in the bundle).
3. Each data point is included in the bundle with the nearest central point. New bundles are created.
4. Return to step 2 until the bundling of the data remains unchanged.

The advantage of this method is that the complexity is low, fast results can be reached even with large data, and the results are visual. The disadvantage is that the results depend on the initial value; it is possible to give different results in each run.

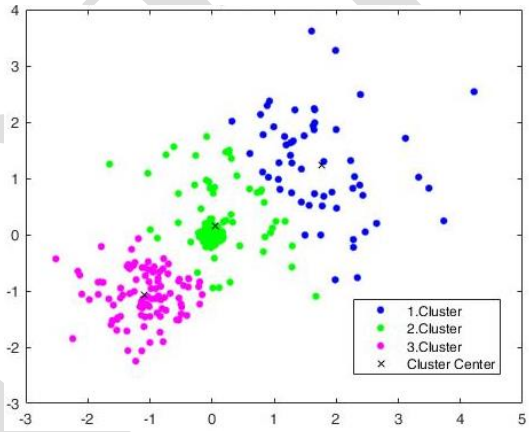


**Figure 4.** Example of a distance-based clustering (*k*=3).

As in Figure 4, in a data set that has only two features, in other words, *x* and *y* features, each point represents an individual. These space-scattered data are divided into clusters by the k-means method, which is a density-based method. In this clustering process, an illustrative representation of a data set with only two features can be easily performed. However, it is impossible to transfer multidimensional data with three or more attributes to a two-dimensional page layout.

In Figure 5, how the same data set, which is desired to be clustered, can be divided into clusters with different numbers has been tested with the codes written in the MATLAB environment. All MATLAB and Python codes, datasets, and results can be examined for testing purposes from the given web address (Website, 2024) and further studies can be carried out. When the simulation results were examined, a smooth and deterministic clustering result was obtained as the test points were distributed close to each other without drawing a specific pattern.

All of these tests can be repeated by deriving synthetic data sets with different correlations between the features. For such cases, the results of the algorithms found in the literature and mentioned in this study

on these data sets can also be examined in further stages. We would like to point out that the clustering results on data sets created according to random distribution and a certain correlation will be different for each algorithm.

It is requested to derive *k* homogeneous clusters for this dataset,. That is, *k* is an hyper-parameter entered into the system from outside. Since some clustering methods (OPTICS, GMM EM, DBSCAN, etc.) are density-based and adaptive, the number of clusters is determined automatically (Bulut et al., 2021). Since the value of k, that is, the number of classes in the school is in a deterministic structure, other methods will not be needed.

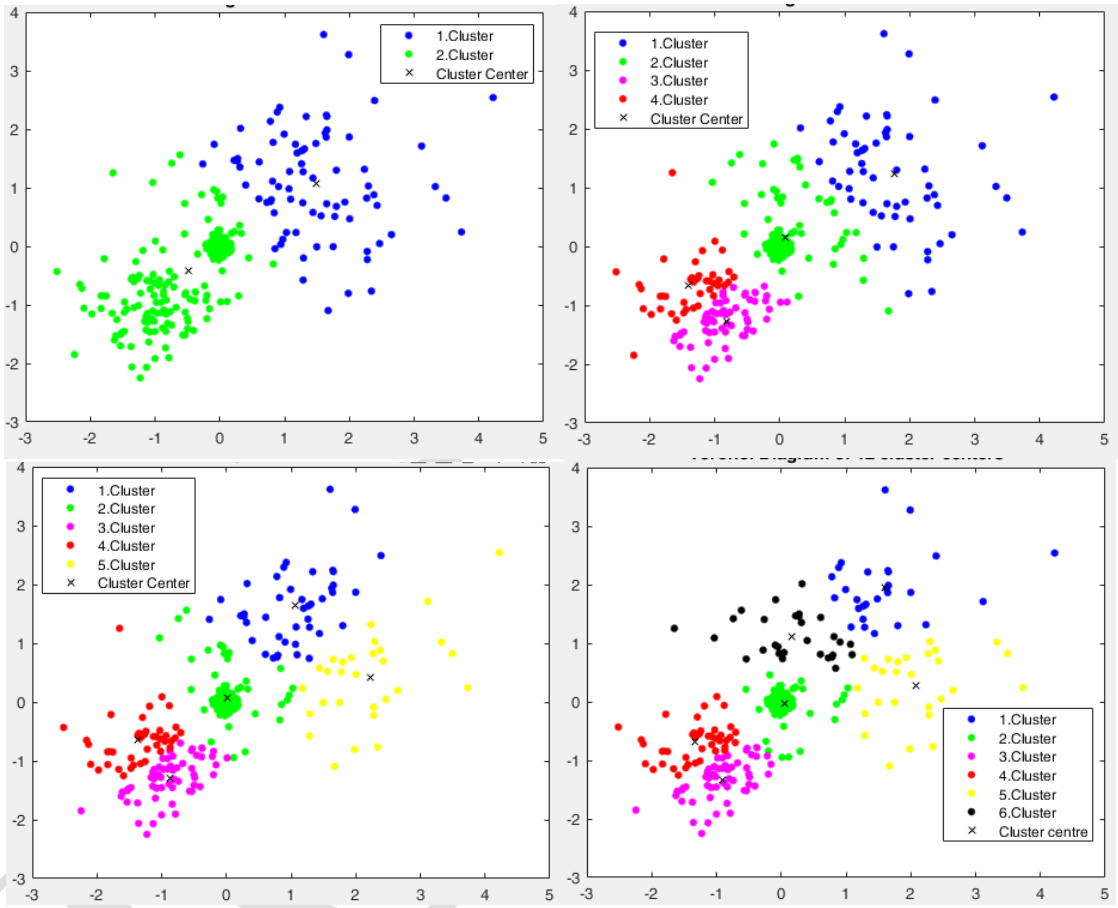


**Figure 5.** Clustering forms in a density-based classification example when the *k* parameter is selected as 2, 4, 5 and 6, respectively.

**Hierarchical (Agglomerative) clustering method**

Kaufmann and Rousseeuw introduced a hierarchical clustering method in 1990 (Kaufman et al., 2009), where each object forms a tuple, and tuples with the least distance are merged step by step. This process continues until a single tuple encompasses all objects or a desired number of tuples is reached, as depicted in Figure 6, demonstrating the bottom-up merging approach for dataset elements.

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

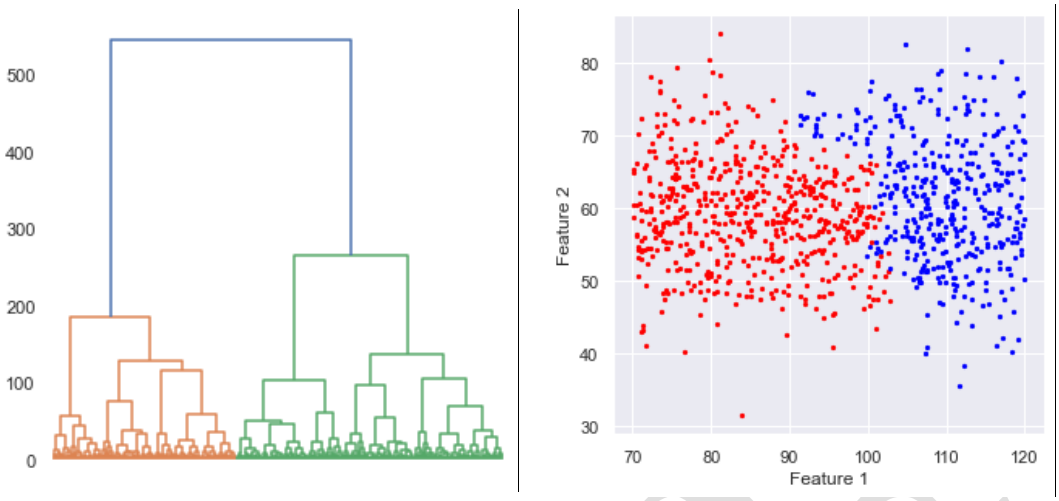


**Figure 6.** An example of a density-based classification.

Useful for small-scale data. Since it goes from many details to the whole, it makes comparisons one by one in large-scale data and combines similar ones, so the processing time is longer.

**Density-based SOM Clustering method**

SOM (self-organizing maps), which can be structurally an example of feed forward networks, behaves like the k-means algorithm for a very small number of neurons. With the increase in the number, the difference of SOM also emerges. The working steps of the algorithm are as follows:

1. The weight values in the neurons in the network are randomly assigned.
2. The input vectors are taken.
3. All values in the map are traversed.

a. The distance between the input vector and the map value being traversed is the Euclidean distance.

b. The node with the shortest distance is taken (this method is called the best matching unit).

4. All nodes adjacent to this optimal node are updated and approximated to the input vector.
5. As long as the current step is less than the time limit on the step, the process is repeated by returning to step 2.

The main advantage of using SOM is that the data is easily interpreted and understood. Reducing dimensionality and grid clustering makes it easier to observe similarities in data. Each input data is inserted into the artificial neural network one by one, and similar trained data are gathered together in a small-sized space. An example SOM scenario is given in Figure 7. As can be seen, the samples in different clusters are nested.

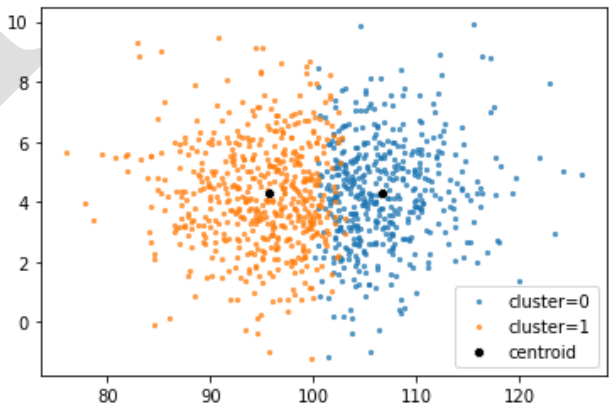


**Figure 7.** An example clustering scenario obtained with SOM (Self-Organizing Maps).

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

**Model-based DBSCAN clustering method**

Density-based clustering algorithms operate with two key parameters: Epsilon, which denotes the maximum radius of a neighborhood, and MinNumber of Objects, indicating the minimum quantity of objects within an Epsilon-radius neighborhood. The algorithm searches for the neighborhood of each database object within an epsilon radius. Clusters are formed around a seed object, object *p*, which has a number of objects exceeding the MinNumber of Objects in its vicinity. Core objects are those that can be directly reached. Clusters connected by density are merged together. The algorithm concludes its process when no additional objects can be added to a cluster.

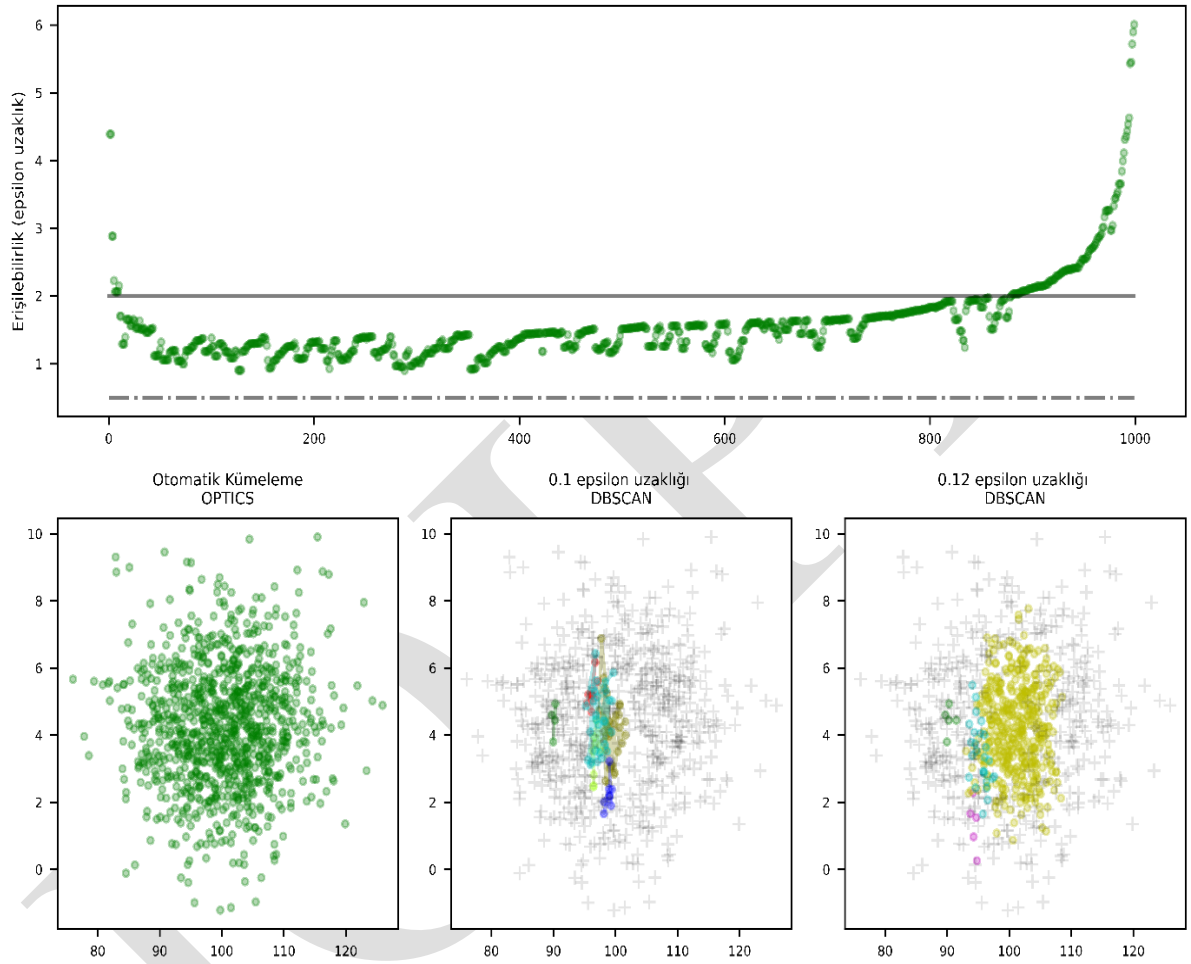


**Figure 8.** An example of a density-based classification by using OPTICS and DBSCAN. The *x* axis is the accessibility distance.

The methodologies of OPTICS and DBSCAN algorithms focus on achieving the most precise clustering by automatically adjusting parameters based on a predetermined step value. However, this approach may inadvertently overlook the optimal parameter setting as it progresses through the steps. As illustrated in Figure 8, identifying clusters with OPTICS proved challenging. Altering the Epsilon parameter yielded different clusters, but due to the lack of sufficient distinctiveness among these clusters, the data sizes were subsequently reduced.

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

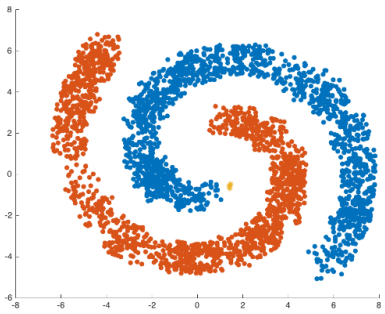

**Figure 9.** DBSCAN parsing nested spiral clusters in a 2D space. The *x* axis is the accessibility distance.

The biggest difference between the DBSCAN algorithm and other algorithms is that it starts in the densest regions and follows the closest points. For this reason, as seen in Figure 9, it can better detect the data extending by following it in a certain order in space (as it does not evaluate only according to location proximity).

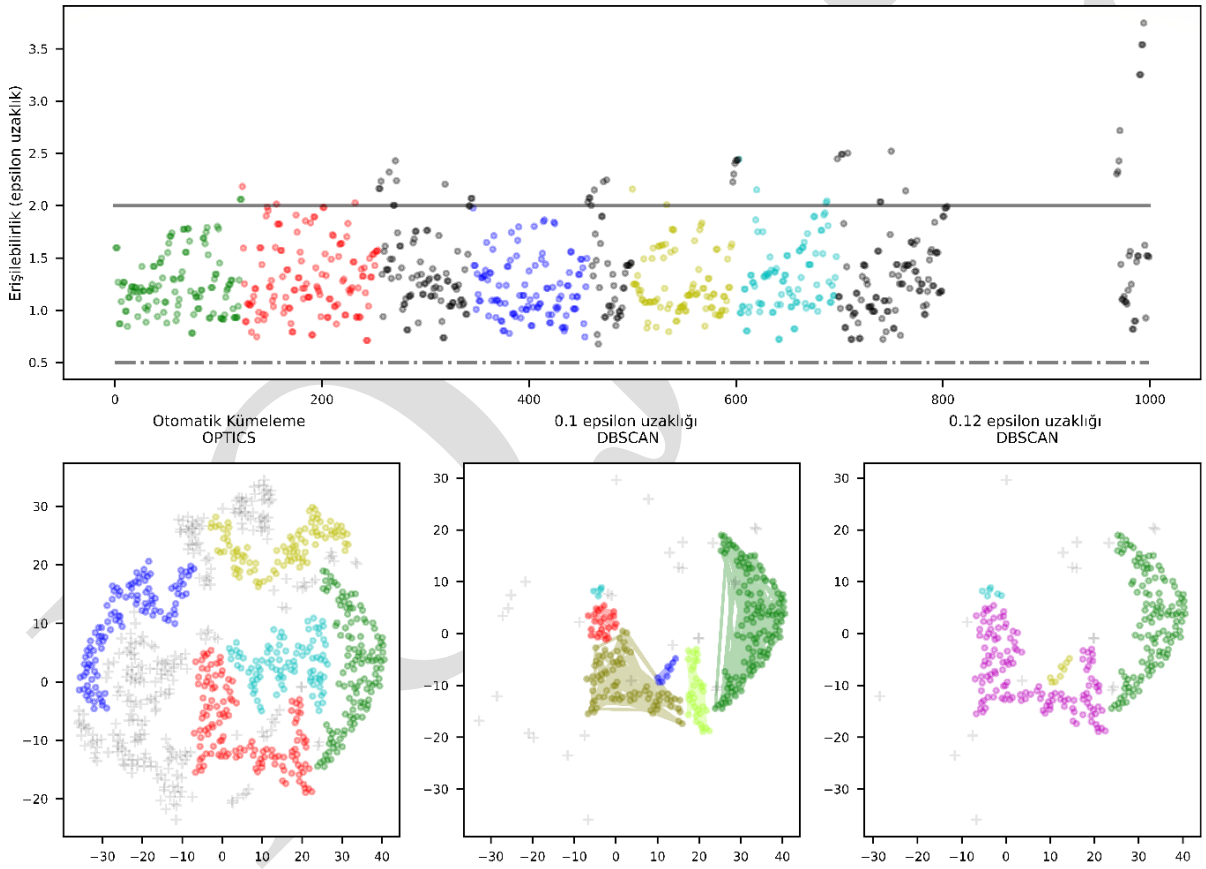


**Figure 10.** An example of density-based classification after t-SNE by using OPTICS and DBSCAN.

**DBSCAN with data reduced in size with t-SNE**

When the data size is too large, using principal component analysis (PCA) or t-distributed stochastic neighbor embedding (Xiao et al., 2023) can first reduce the size of the data and then apply DBSCAN. For data representations with more than two features, reducing the size to two or three can provide better results for clustering algorithms by both increasing visibility and reducing sparsity.

As seen in Figure 10, clusters can be formed more clearly, when DBSCAN is applied by reducing the data to two dimensions. The *x* axis is the accessibility distance.

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

**Clustering with Voronoi Diagram**

100 students who will study in the first grade in a primary school are to be distributed equally to five classes. By looking at the attribute information of the students, the algorithms to be used in the project can distribute these students among five classes in a homogeneous structure. Clustering algorithms do not ask the user the number of cluster elements to be determined as a parameter. They choose the most suitable cluster members themselves, depending on their working mechanism. In this case, the number of elements in one set may be considerably higher than the other. In such cases, the data space can also be fragmented with the help of Voronoi diagrams (Feng et al., 2018).

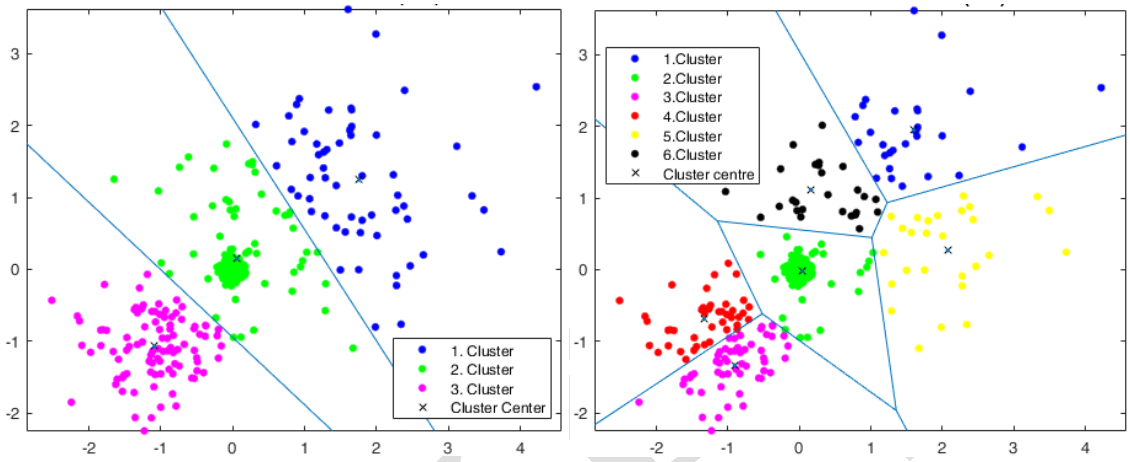


**Figure 11.** Determination of cluster boundaries (blue lines) with Voronoi diagram (two different cases for $k$=3 and $k$=6).

Figure 11 shows how the clustering result will be with the Voronoi diagram for $k$=3 and $k$=6 cases on the same data set. If the number of classes to be opened in the school is 3 or 6, the points between the boundary lines can be manually shifted to create an equal number of classes in another cluster.

The biggest problem that can be encountered in the studies carried out with the help of current algorithms that create the Voronoi diagram is that the obtained outputs, namely the resulting clusters, cannot be displayed in two-dimensional environments and submitted to human control. In such cases, as can be seen in the calculation below, individual examinations can be performed by producing two-dimensional Voronoi diagrams, usually as many as the 2-combinations of ($n$($n$-1)/2).

**Clustering/classification with Semi-Supervised Learning**

Semi-Supervised Learning is the process of separating a small number of labeled samples and a large number of unlabeled samples into certain classes or clusters (Hady et al., 2013). Bee-supervised learners, on the other hand, ensure that a homogeneous class is formed by selecting other students who are suitable for the qualifications of the determined students, in case a teacher requests some students that he/she definitely wants to be in his class. Semi-supervised clusterers can be broadly subdivided as follows (Basu et al., 2002):

1. Generative models
2. Low-density separation
3. Graph-based methods
4. Heuristic approaches

After the data set is created, the four different methods mentioned can be run separately, and the educators can be expected to evaluate the results obtained. A teacher determines some of the students that he/she wants to be in his class, and the other students are distributed to the classes accordingly. This necessitates the use of semi-supervised learning algorithms.

It is an important issue whether supervised and unsupervised methods show success on a given dataset at the expected level, and different and valuable studies have been carried out in this area (Basu et al., 2002), (Maulik et al., 2002). A comparative study can also be made on the data set created by these methods.

## DISCUSSIONS, FURTHER STUDIES, and CONCLUSION

The present study introduces a novel framework for the allocation of students to classes in the primary education sector, leveraging insights from a variety of methodologies evaluated against a set of established benchmarks. Each methodology brings to light unique benefits, highlighting the richness and potential inherent in diverse allocation strategies (Johnson et al., 2009). This research addresses the complexities involved in achieving an equitable and fair distribution of students across elementary classes, acknowledging the limitations of purely algorithmic solutions in addressing the nuanced demands of such allocations. Advocating for a more comprehensive approach, the study underscores the importance of incorporating expert opinions, evaluations by educators, input from parents, and a detailed analysis of student characteristics as integral to devising an efficacious class distribution system (Oakes, 2005). By amalgamating these factors, the research proposes an all-encompassing framework for student placement that is sensitive to both academic and social considerations, while also being responsive to the individual needs and capabilities of students in a primary educational context. The envisioned system is aimed at creating a more equitable and conducive learning environment, thereby facilitating improved educational outcomes and fostering student growth (Slavin, 1996).

Building upon the innovative approach to student class assignment in primary education proposed in the study, several recommendations for practitioners and further research avenues emerge. These suggestions aim to refine the comprehensive system for student placement, ensuring it effectively meets the diverse needs of students while enhancing educational outcomes.

There are some suggestions for Practitioners and researchers:

- Implementing Pilot Programs: Schools should consider piloting the proposed class assignment system under a controlled regulation. This would allow educators to identify practical challenges and assess the system's impact on student learning and social integration.
- Professional Development: Offer training programs for teachers and administrators on the holistic approach to student assignment. This includes understanding the importance of incorporating expert opinions, educator evaluations, and parental feedback.
- Continuous Feedback Mechanism: Establish mechanisms for ongoing feedback from students, parents, and educators to continually refine the class assignment process. This also ensures the system remains adaptive to changing student needs and educational goals.
- Comparative Research: Undertake comparative studies to evaluate the effectiveness of the proposed system against traditional class assignment methods. This could involve quantitative measures of student achievement and qualitative assessments of student and teacher satisfaction.
- Technology Integration: Investigate the potential for integrating advanced technologies, such as machine learning algorithms and artificial intelligence, to enhance the efficiency and effectiveness of the student assignment process while maintaining a holistic approach.

By addressing these recommendations and further studies, practitioners and researchers can contribute to the development of more equitable, effective, and responsive educational environments. This collaborative effort will pave the way for optimizing class assignments in

primary education, ultimately fostering a more balanced and beneficial educational experience for students.

**Conclusion**

The innovative model presented for allocating students to classes increases the capabilities of artificial intelligence to significantly develop both the performance of individual students and the overall effectiveness of classrooms. By focusing on the use of Unsupervised and Semi-Supervised Learning algorithms, which are particularly adept at handling smaller datasets, the model aims to increase total educational success. Unlike traditional approaches in the literature, this study does not attempt into the creation of new technological tools or the development of novel algorithms. Rather, it applies established computer science algorithms to a new domain, specifically to the realm of primary education, thus demonstrating the versatility and potential of these algorithms when applied outside their usual contexts. The creation of this blueprint model presents a pioneering step towards integrating computer science principles into educational strategies by offering a class distribution style. Additionally, this initiative enables a way for interdisciplinary collaboration, inviting experts from various fields to contribute to the enhancement of educational outcomes through technological innovation.

This presented research provides a preliminary exploration into harnessing the power of computer science for optimizing classroom allocations in primary schools. It is notable for its creative use of existing methods in literature and its contribution to academic discourse by highlighting the availability of innovation across different fields. By merging educational goals with data science methods, this research not only introduces a novel solution to a common problem but also motivates further studies and development efforts aimed at enhancing the quality of primary education through artificial intelligence.

**Availability**

All of the official permission documents, survey questions, generated datasets, classification, and clustering codes written in MATLAB and Python programming languages for this research study can be obtained and downloaded from the following website (sites.google.com/site/bulutfaruk/study-of-clustering-on-education) for further studies. The specified web address offers access to various details and documents related to the research, including official permissions. It also features project details, the work area, survey questions, and sample petitions used in the official permit application. These documents, often confidential, are made available to aid potential researchers in understanding the necessary preparatory steps before initiating their projects.

**Acknowledgments**

We would like to express our endless thanks and gratitude to the Governorship of Izmir (*İzmir Valiliği*) and the Çiğli National Education Directorate (*Çiğli İlçe Milli Eğitim Müdürlüğü*) for allowing this study, and to the administrators, teachers, and students of TOKİ Karşıyaka Municipality Primary School (*TOKİ Karşıyaka Belediyesi İlkokulu*) who helped us in collecting data and carrying out the necessary experimental studies.

**Ethics and Conflict of Interest**

The survey studies were carried out with the official authorization under document number 15585669-604.01.02-E.3979850, dated April 08, 2016, acquired from the Çiğli National Education Directorate. The data collection involved ten first-grade students, proceeding with explicit consent from their parents and under the meticulous supervision and support of their classroom teacher. Since the official permissions and data used in the article study were obtained before the year 2020, there was no obligation to obtain an official permission from the Ethics Committee. The authors declare that they have no conflict of interest.

**Author Contributions**

The authors' contributions to the research article are almost equal.

**Corresponding Author**
Correspondence to Faruk BULUT, farukbulut@esenyurt.edu.tr

## REFERENCES

Adams-Byers, J., Whitsell, S. S., & Moon, S. M. (2004). Gifted students' perceptions of the academic and social/emotional effects of homogeneous and heterogeneous grouping. *Gifted Child Quarterly*, *48*(1), 7-20.

Alpaydin, E. (2021). *Introduction to machine learning*. Adaptive Computation and Machine Learning series, MIT press.

Backer, E., & Jain, A. K. (1981). A clustering performance measure based on fuzzy set decomposition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, (1), 66-75.

Basu, S., Banerjee, A., & Mooney, R. (2002). Semi-supervised clustering by seeding. *In Proceedings of 19th International Conference on Machine Learning* (ICML-2002).

Bellinger, G., Castro, D., & Mills, A. (2004). Data, information, knowledge, and wisdom. https://homepages.dcc.ufmg.br/~amendes/SistemasInformacaoTP/TextosBasicos/Data-Information-Knowledge.pdf

Bosworth, R. (2014). Class size, class composition, and the distribution of student achievement. *Education Economics*, *22*(2), 141-165.

Briggs, M. (2020). Comparing academically homogeneous and heterogeneous groups in an active learning physics class. *Journal of College Science Teaching*, *49*(6), 76-82.

Bulut, F. (2016). Çok katmanli algilayicilar ile doğru meslek tercihi [Right career choice using multi-layer perceptron]. *Anadolu University Journal of Science and Technology A-Applied Sciences and Engineering*, *17*(1), 97-109.

Bulut, F., & Amasyali, M. F. (2016). Katı kümeleme ve yeni bir geçiş fonksiyonuyla uzman karışımlarında sınıflandırma [Classification in mixture of experts using hard clustering and a new gate function]. *Journal of the Faculty of Engineering and Architecture of Gazi University*, *31*(4), 1017-1025.

Bulut, F. (2020). The minimum ratio of preserving the dataset similarity in resampling: (1− 1/e). *International Journal of Information Technology*, *12*(1), 231-244.

Bulut, F., Bektaş, M., & Yavuz, A. (2021). Efficient path planning of drone swarms over clustered human crowds in social events. *International Journal of Intelligent Unmanned Systems*.

Çelenk, S. (2008). İlköğretim okulları birinci sınıf öğrencilerinin ilkokuma ve yazma öğretimine hazırlık düzeyleri [Level of readiness for reading and writing education among first grade students of primary schools]. *Abant İzzet Baysal University Journal of the Faculty of Education*, *8*(1), 83-90.

Feng, X., & Murray, A. T. (2018). Allocation using a heterogeneous space Voronoi diagram. *Journal of Geographical Systems*, *20*(3), 207-226.

Filatova, O. A. (2015). Cultural attributes of students to make student-centered approach successful. *International Journal of Languages, Literature and Linguistics*, *1*(1), 20-24.

Gabaldon-Estevan, D. (2020). Heterogeneity versus homogeneity in schools: A review of the educational value of classroom interaction. *Education Sciences*, *10*(11), 335. https://doi.org/10.3390/educsci10110335

Gao, Y., Lin, T., Zhang, Y., Luo, S., & Nie, F. (2021). Robust principal component analysis based on discriminant information. *IEEE Transactions on Knowledge and Data Engineering*.

Groth, D., Hartmann, S., Klie, S., & Selbig, J. (2013). Principal components analysis. *Computational Toxicology: Volume II*, 527-547.

Hady, M. F. A., & Schwenker, F. (2013). Semi-supervised learning. *Handbook on Neural Information Processing*, 215-239.

Hallam, S., & Ireson, J. (2001). Ability grouping in education. *Ability Grouping in Education*, 1-240.

Han, X., Zhu, Y., Ting, K. M., & Li, G. (2023). The impact of isolation kernel on agglomerative hierarchical clustering algorithms. *Pattern Recognition*, 139, 109517.

Hodum, J. (2016). *Ability grouping for academic growth in the elementary school*. Union University.

Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education. Boston: Center for Curriculum Redesign*.

Ian, HW, & Eibe, F. (2005). *Data mining: Practical machine learning tools and techniques*.

Jayalakshmi, T., & Santhakumaran, A. (2011). Statistical normalization and back propagation for classification. *International Journal of Computer Theory and Engineering*, *3*(1), 1793-8201.

Johnson, D. W., & Johnson, R. T. (2009). An educational psychology success story: Social interdependence theory and cooperative learning. *Educational Researcher*, *38*(5), 365-379. https://doi.org/10.3102/0013189X09339057

Kaufman, L., & Rousseeuw, P. J. (2009). *Finding groups in data: an introduction to cluster analysis*. John Wiley & Sons.

Koray, Ö., & Tatar, A. G. N. (2003). Primary school students' misconceptions about mass and weight and the distribution of these misconceptions according to the 6th, 7th and 8th grade levels. *Pamukkale University Journal of Education Faculty*, *13*(13), 187-198.

Kuh, G. D., Kinzie, J. L., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What matters to student success: A review of the literature* (Vol. 8). Washington, DC: National Postsecondary Education Cooperative.

Lebedina-Manzoni, M. (2004). To what students attribute their academic success and failure. *Education*, *124*(4), 699-709.

Lu, F., & Anderson, M. L. (2015). Peer effects in microenvironments: The benefits of homogeneous classroom groups. *Journal of Labor Economics*, *33*(1), 91-122.

Mair, P. (2018). Factor analysis. In *Modern Psychometrics with R* (pp. 17-61). Springer, Cham.

Maulik, U., & Bandyopadhyay, S. (2002). Performance evaluation of some clustering algorithms and validity indices. IEEE *Transactions on pattern analysis and machine intelligence*, *24*(12), 1650-1654.

Motegi, R., & Seki, Y. (2023). SMLSOM: The shrinking maximum likelihood self-organizing map. *Computational Statistics & Data Analysis*, 182, 107714.

Mulkey, L. M., Catsambis, S., Steelman, L.C., & Crain, R. L. (2005). The long-term effects of ability grouping in mathematics: A national investigation. *Social Psychology of Education*, *8*(2), 137-177.

Oakes, P. J., Haslam, S. A., Morrison, B., & Grace, D. (1995). Becoming an in-group: Reexamining the impact of familiarity on perceptions of group homogeneity. *Social Psychology Quarterly*, 52-60.

Oakes, J. (2005). *Keeping track: How schools structure inequality* (2nd ed.). Yale University Press.

Puntambekar, S. (2022). Distributed scaffolding: scaffolding students in classroom environments. *Educational Psychology Review*, *34*(1), 451-472.

Rivkin, S. G., & Schiman, J. C. (2015). Instruction time, classroom quality, and academic achievement. *The Economic Journal*, *125*(588), F425-F448.

Rytivaara, A. (2011). Flexible grouping as a means for classroom management in a heterogeneous classroom. *European Educational Research Journal*, *10*(1), 118-128.

Salwana, E., Hamid, S., & Yasin, N. M. (2017). Student academic streaming using clustering technique. *Malaysian Journal of Computer Science*, *30*(4), 286-299.

Schullery, N. M., & Schullery, S. E. (2006). Are heterogeneous or homogeneous groups more beneficial to students?. *Journal of Management Education*, *30*(4), 542-556.

Sheridan, K., Puranik, T. G., Mangortey, E., Pinon-Fischer, O. J., Kirby, M., & Mavris, D. N. (2020). An application of DBSCAN clustering for flight anomaly detection during the approach phase. *In AIAA Scitech 2020 Forum* (p. 1851).

Shields, C. M. (1995). A comparison study of student attitudes and perceptions in homogeneous and heterogeneous classrooms. *Roeper Review*, *17*(4), 234-238.

Slavin, R. E. (1996). Research on cooperative learning and achievement: What we know, what we need to know. *Contemporary Educational Psychology*, *21*(1), 43-69. https://doi.org/10.1006/ceps.1996.0004

Taghizabet, A., Tanha, J., Amini, A., & Mohammadzadeh, J. (2023). A semi-supervised clustering approach using labeled data. *Scientia Iranica*, *30*(1), 104-115.

Wang, Q., Wang, F., Ren, F., Li, Z., & Nie, F. (2021). An effective clustering optimization method for unsupervised linear discriminant analysis. *IEEE Transactions on Knowledge and Data Engineering*.

Website, https://sites.google.com/site/bulutfaruk/study-of-clustering-on-education, Received: 28/Feb/2024

Wyman, P. J., & Watson, S. B. (2020). Academic achievement with cooperative learning using homogeneous and heterogeneous groups. *School Science and Mathematics*, *120*(6), 356-363.

Xiao, B., Wang, Z., Liu, Q., & Liu, X. (2018). SMK-means: an improved mini batch k-means algorithm based on mapreduce with big data. *Comput. mater. Continua*, *56*(3), 365-379.

Xiao, C., Hong, S., & Huang, W. (2023). Optimizing graph layout by t-SNE perplexity estimation. *International Journal of Data Science and Analytics*, *15*(2), 159-171.

Xie, Y., Wu, D., & Qiang, Z. (2023). An improved mixture model of gaussian processes and its classification expectation–maximization algorithm. *Mathematics*, *11*(10), 2251.

Yoleri, S. (2013). The effects behavior problems in preschool children have on their school adjustment. *Education*, *134*(2), 218-226.

Yoleri, S. (2014). The effects of age, gender, and temperament traits on school adjustment for preschool children. *e-International Journal of Educational Research*, *5*(2), 54-66.

Yoleri, S. (2015). Preschool children's school adjustment: indicators of behavior problems, gender, and peer victimisation. *Education* 3-13, *43*(6), 630-640.

Zhang, S., Zhang, C., & Yang, Q. (2003). Data preparation for data mining. *Applied artificial intelligence*, *17*(5-6), 375-381.

Zhu, X., Zhang, S., Jin, Z., Zhang, Z., & Xu, Z. (2010). Missing value estimation for mixed-attribute data sets. *IEEE Transactions on Knowledge and Data Engineering*, *23*(1), 110-121.

## About the authors:

**Faruk Bulut**
Faruk Bulut holds the position of Associate Professor in the Computer Engineering Department at Istanbul Esenyurt University. His research interests include Machine Learning, Image Processing, Optimization Methods, Decision Support Systems, and Graph Theory. Throughout his career, Bulut has served in various capacities, including educator, instructor, engineer, project manager, and consultant, contributing to numerous projects within both private and government sectors.

**İlknur Dönmez**
İlknur Dönmez works as a Senior Researcher at TÜBİTAK Informatics and Information Security Research Center (BİLGEM). She received her doctorate degree from Istanbul Technical University with her thesis titled "Grammatic and Semantic Analysis of Turkish Sentences Based on Predicates". In addition to his academic achievements, Dönmez also has some industrial experience in areas such as Machine Learning, Data Mining, Big Data and Natural Language Processing.

**Ibrahim Furkan Ince**
Ibrahim Furkan Ince is an Assistant Professor in the Department of Computer Engineering at Nişantaşı University, Istanbul. He received his doctorate from Kyungsung University in Korea, where his thesis, titled “A Study on Gaze Enhanced User Interfaces: Committing Eye Tracking,” explored innovative approaches in user interface design. His academic research focuses on areas such as Image Processing, Computer Vision, Machine Learning, and Human-Computer Interaction.

**Pavel Petrov**
Pavel Petrov is an Associate Professor in the Department of Informatics at the University of Economics – Varna, Bulgaria. His research delves into Information Systems, Web Technologies, Data Processing, Big Data, Fuzzy Linear Hybrid Automata, and Real-Time Applications, contributing valuable insights into these evolving fields.

IOJPE

ISSN: 1300 – 915X
www.iojpe.org

*International Online Journal of Primary Education* *2024, volume 13, issue 1*

# DEVELOPING SCHOOL ORIENTATION OF THE FIRST-GRADE STUDENTS IN PRIMARY SCHOOL THROUGH CREATIVE DRAMA

Nazife TOSUN
Pre-school teacher, Burdur Mehmet Akif Ersoy Universty, Institute of Education Sciences, Burdur, Türkiye
ORCID: https://orcid.org/0000-0002-6983-3065
ntosun32@gmail.com

Kenan DEMİR
Assoc.Prof.Dr., Burdur Mehmet Akif Ersoy University, Faculty of Education, Burdur, Türkiye
ORCID: https://orcid.org/0000-0002-1111-2097
kenandemirkfe@gmail.com

**Received:** May 22, 2023 **Accepted:** January 25, 2024 **Published:** March 31, 2024

**Suggested Citation:**
Tosun, N., & Demir, K. (2024). Developing school orientation of the first-grade students in primary school through creative drama. *International Online Journal of Primary Education (IOJPE), 13*(1), 53-77. https://doi.org/10.55020/iojpe.1300773

This is an open access article under the CC BY 4.0 license.

**Abstract**

In this study, the orientation of the first-grade primary school students to school was ensured by creative drama activities. Activities that lasted 21 hours were applied to ensure that the students adapted to the school, their friends, their teachers, school staff, and places in the school. Parents, classroom teacher, 19 students and two prospective teachers as observers participated in this study. Quantitative data were collected before and after the drama workshop by the "Objectives Attainment Evaluation Form" and this data were compared with the non-parametric tests. Qualitative data were obtained using written and individual interviews. This study contributed positively to students' communication and cooperation, recognizing the school and the class and realizing the school and classroom rules. The findings showed that school orientation studies improved social skills, such as empathy by increasing interaction between the school, the parents, and the students. The families participating in these activities stated that they understood their children better, felt like children, and they implied they remembered their childhood years. The current study displayed that creative drama activities significantly facilitated the orientation of the students to their schools.

**Keywords**: Primary school orientation, orientation skills, orientation program, creative drama.

## INTRODUCTION

One of the most crucial steps in a person's life journey is school. Children spend most of their days in this social environment, away from their families (Altıntaş, 2015). Like everyone who has just experienced a place, job, situation or event, first-grade children who have just started primary school are expected to adapt to school, their friends, teachers and other school-related issues (Ateş, 2016; Bascoe et al., 2009; Borbélyová, 2017; Chi et al., 2018; Jindal-Snape 2018; Lifshin et al., 2019; Taşçı & Dikici Sığırtmaç, 2014).

To start a new school causes various challenges experienced by children and families. However, it represents a critical period for children. When entering a new educational institution, children may face educational processes, expectations, and requirements that are very different from those they experienced in their early education and home environments (Cook et al., 2019). Many factors, such as preschool experiences, preschool teachers and primary school teachers, individual characteristics of the child, family, school and teacher, and the relationships between them, have a critical place in contributing to the child's orientation to the new school (Correia & Marques-Pinto, 2016; Urbina-García, 2019).

A child who is mature enough to start school is asked to fulfill basic skills, such as completing the job he started, taking care of himself, taking responsibility, and expressing himself without help. In addition, it is significant that the age, health, gender, all sense organs, and intelligence of children beginning

primary school work in harmony with each other, and it is included in the learning activity. At the same time, physiological factors, such as being able to hold a pen, sitting properly at a desk, and being able to place one's feet entirely on the ground while writing may also be effective during this period. Cognitively, the child must have mental structures, such as writing, reading, thinking and problem-solving when they start primary school (Göktaş & Gülay Ogelman, 2019; Güler, 2016; National School Readiness Indicators Initiative, 2005; Tuğluk & Ayhan, 2019; Türker & Tunç, 2021; Yalçın, 2017). Despite the expectations of schools from children, it is normal for children to experience various orientation problems and exhibit undesirable behaviors in the face of these new situations they encounter (Cokuk & Kozikoğlu, 2020; Kurtuluş Çalışkan & Canbulat, 2023).

**Orientation**

Orientation for a student can be defined as having sufficient learning to fulfill the duties and responsibilities required by the school and class and being able to establish positive social relationships (Ladd, Birch, & Buhs, 1999; Önder & Gülay, 2010). It is not the child's duty to adapt to the school, which is considerably affected by events, situations and people outside the child, and it is also unthinkable for the child to adapt to the school alone. Adapting to a place, society, program and innovation is not a superficial and concrete variable that can only be explained by the student's characteristics. A child's adjustment to school is a product of the relationships that develop between parents, school, teachers, administrators, and other children (Carida, 2011; Dockett & Perry, 2007; Wildenger & McIntyre, 2011).

In recent years, the school readiness perspective has been expanded to include different areas, such as motor development and physical health. The social and emotional development of children, their approach to learning, language, cognition and motor development, the school's individual characteristics of the children and responding to the cultural diversity and needs of their families are crucial elements in this perspective (National School Readiness Indicators Initiative, 2005; Urbina-Garcia, 2020; Yoo & Lee, 2013).

Orientation, which is associated with variables, such as the student's school success, social interaction, interest and comfort, has been determined as a significant predictor of characteristics, such as teacher-student relationships, students' school anxiety and academic success (Cook & Coley, 2017; de Moura Pereira & Figueira, 2011; Lee & Bierman, 2015; Legkauskas & Magelisnkate-Legkauskiene, 2021; Özer et al., 2021; Ryan, Shim, & Makara, 2013).

Orientation is a situation that occurs and develops spontaneously over time. Many factors, such as the school environment, classroom teachers, peers, parents, developmental characteristics and implementation of the orientation program, affect the school orientation process of school-age children (Akis, 2018; Bay & Şimşek Çetin, 2014; Borbélyová et al., 2018; Demir et al., 2020; O'Farrelly et al., 2020; Roorda et al., 2020; Üstündağ, 2014; Zupancic & Kavcic, 2011). For a child to be prepared for school, "School conditions," "Teacher," "Education program" and "School transition practices" must be ready (Emig, Moore, & Scarupa, 2001; Güner & Kartal, 2019). The orientation program is initially an abstract plan. Within the framework of this plan, the school, orientation and course programs, course materials, place, family and students must be ready before the schools open. The current understanding of education agrees that the orientation process should be carried out within the framework of a program. In this regard, many countries organize orientation programs for first-grade students, as well as activities, such as school and classroom visits and parent orientations, to introduce children and families to the new school and its features to facilitate the orientation of children (Cook et al., 2019).

In Türkiye, the Ministry of National Education (MEB) prepared an orientation program for 1st graders in primary schools, 5th grades in secondary schools and 9th grades in high schools. Necessary explanations have been made in these programs, which include program achievements and sample activities (MEB, 2014; 2019a; 2019b). In its circular numbered 2019/9, MEB planned the orientation program to be held on Thursdays and Fridays before the first week of school. In the published study program, eight lessons of 40 minutes each in the Primary School Orientation Program are given as

examples. These activities include "Meeting, Getting to Know the Place, Getting to Know the Rules" on the first day and "Getting to Know the School, Learning the Rules and Play" on the second day. A total of six hours were allocated to these activities in the orientation program (MEB, 2019a).

The orientation program includes activities, such as games, meeting teachers and students, guessing the places and units in the school with pictures, and visiting the school. In addition, activities, such as students painting, teachers giving information, and telling stories with visuals were also included. Other studies on orientation activities have also determined that orientation activities are beneficial for students to adapt to school but are not at a sufficient level (Ateş, 2016; Göktaş & Gülay Ogelman, 2019; Işıkoğlu Erdoğan & Şimşek, 2014; Özgür İnam, 2013; Urbina-Garcia, 2020; Üstündağ, 2014).

**Implementation of orientation programs and creative drama orientation**

The skills that are aimed to be acquired by students and are at the basis of orientation programs are directly related to the teaching ways (teaching model, strategy, method, technique, equipment, test cases, and place) that the teacher will utilize. Creative drama is one of the teaching methods and enables game-based learning for the orientation program (Akhan & Demir, 2020; Demir, 2019; Freeman & Ray-Fulton, 2003; Köksal Akyol, 2019; Jindal-Snape et al., 2011). Creative drama differs from other teaching methods because participants use all their sense organs effectively in learning. Creative drama is a discipline and teaching method that helps individual's all-round development by enabling him to experience and condition himself voluntarily and effectively. Creative drama is a teaching method that includes techniques, such as improvisation, role playing, dramatization and pantomime, making it easier for the individual to get to know himself and others. In addition, creative drama is a powerful teaching method that provides a safe space for students to develop skills, such as creativity, imagination, decision-making, communication, interaction, respecting people with different characteristics, understanding themselves and others, and gaining self-confidence (Adıgüzel, 2019; Baldwin & Galazka,2022; Brown, 2017; Ladd & Price, 1987; MEB, 2014; Önder, 2012; Jindal-Snape et al., 2011). Characteristics, such as knowledge, skills and emotions, which are aimed to be imparted to students through orientation program activities, overlap with the achievements and features of the creative drama method. In addition, it has been determined in many studies that creative drama activities are useful and effective in developing social skills and experience that support the orientation process (Ceylan et al., 2019; Chi et al., 2018; Demir, 2019; Usakli, 2018).

In various European countries, as in Türkiye, various programs have been planned to be implemented to facilitate the transition of children from kindergarten to primary school and their orientation to new schools, and Innovative Educational Programs have been developed within this framework. International institutions, such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Organization for Economic Co-operation and Development (OECD), have also provided significant support to these programs (Carida, 2011).

In Portugal, within the scope of the reorganization of the school network in 2008, a sequential and detailed program was prepared to promote a positive transition between different school levels, facilitate the transition from one level to another and orientation to the new program (Correia & Marques-Pinto, 2016; Legkauskas & Magelisnkate-Legkauskiene, 2021).

Urbina-Garcia (2020) prepared and implemented a program covering cognitive, social and fine motor skills that facilitates and adapts the transition to first grade in Mexico City. The study determined that the preschool transition program had a positive effect on children's cognitive, social and fine motor skills. In addition, it was concluded that ensuring the active participation of students and giving in-class tasks contributed to students' acceptance of the school. Another study on orientation in Korea found that the school-based Maum Meditation program made significant contributions to the development of students' self-esteem and orientation to school (Yoo & Lee, 2013). A school orientation program was implemented in Northern Italian schools, considering the Reggio-Emilia approach, to improve school liking-school avoidance, internalization-externalization problems, cooperation and academic success. At the end of the study, it was determined that all variables related to better orientation after the transition

from preschool education to primary school were positively affected (Schneider, Manetti, Frattini, Rania, Santo, Coplan, & Cwinn, 2014).

A game-integrated preparation program was implemented in the transition from kindergarten to primary school in Hong Kong. At the end of the study, it was concluded that transition to school practices through game were effective in reducing children's anxiety, being happier and adapting (Li & et al., 2013). In Scotland, orientation program activities with creative drama were implemented in the transition from primary school to secondary school. At the end of the study, it was revealed that creative drama developed students emotionally, helped them find solutions to problems, experienced realistic scenarios and provided a safe space to rehearse real life. It has been concluded that creative drama activities can be used effectively in students' transition to a new school (Jindal-Snape, Vettraino, Lowson & McDuff, 2011). In another study conducted in Scotland, orientation studies were carried out with drama during the transition from primary school to secondary school. At the end of the study, it was determined that the students developed their feelings of empathy, meta-awareness, solidarity and citizenship; It has been concluded that it supports their social and emotional development (Barlow, 2019).

As a discipline and teaching method, creative drama positively affects many characteristics of the participants, such as their social, emotional development and competencies, and communication skills (Batdi & Elaldi, 2020; Folostina et al., 2015; Gao, Hall, Linder, Leonard & Quina, 2022; Usakli, 2018). In a study conducted with completely fictional improvisation exercises, it was determined that these exercises caused real emotional reactions. These findings provided new biological evidence for the impact of drama elements (Seppänen et al., 2021).

Brown (2017) stated that creative drama used in early childhood classes may include elements, such as improvisation, role playing, storytelling or animation, puppet play, music and dance. He states that the creative drama process allows children to use their creativity, so that children often use objects, decor, space and the interactions that occur in the process to discover and learn about themselves and the world around them.

It has been revealed in many studies that orientation programs developed and implemented based on mutual communication, trust and respect between teachers, administrators, children and parents help solve orientation problems (Coelho, Marchante, & Jimerson, 2017; Cook, Coley, & Zimmermann, 2019; Correia & Marques-Pinto, 2016; Dockett & Perry, 2003; Loukas, Ripperger-Suhler & Herrera, 2012; MEB, 2014; 2019a).

In this study, the teaching process was planned and implemented by considering the stages of the creative drama method, including warm-up-preparation, animation and evaluation. In the creative drama process, simple drama techniques, such as improvisation, role playing and dramatization were used. In addition, activities are included, especially educational games, and also at a simple level, where children can use their multiple intelligences. It was determined whether the orientation study designed and implemented with creative drama activities provided a significant improvement in students' orientation to school. In this context, the effectiveness of the research was revealed by including the opinions of all stakeholders (student, parent, teacher, school administrator, teacher candidates and researcher) who participated directly or indirectly in this study.

**Problem Statement of this Research**

In this study, "What are the opinions and observations of students, classroom teachers, school administrators, researchers, parents and prospective teachers regarding the contribution of creative drama activities to first-grade students' adaptation to school?" question was determined as the main question of this research.

This research consisted of the first-grade students who just started the school and their classroom teacher in a primary school in the city center of Burdur in the spring term of the 2019-2020 academic year. In addition, the opinions, and observations of all participants as students, parents, classroom teacher, the

administrator, prospective teachers, and researchers who voluntarily participated in creative drama activities were accepted sincere and realistic.

## METHOD

### Research Design

This study was designed and implemented with the simultaneous variation pattern which is one of the mixed research methods and requires both quantitative and qualitative research methods (Creswell, 2021; Creswell & Creswell, 2018). In the quantitative study of this research, one-group pre-test/post-test experimental design; in the qualitative study, case design was implemented (Yıldırım & Şimşek, 2016). In the qualitative part of this study, as well as the researcher's observations and opinions, classroom teachers,' students,' parents,' administrators, and prospective teachers' observations and opinions were collected. The research process design, in which quantitative and qualitative data were collected and organized together, is shown in Table 1.

**Table 1**. Research design and process.

| | First-grade Creative Drama Workshops (Teaching-Learning Process) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pre-measurement | 1. Meet | 2. Communication-Interaction | 3. Adapt | 4. Building Trust | 5. Environment -Place Recognition | 6. Getting to Know School Staff | 7. Adaptation to Class and School Rules | 8. Evaluation | Post-measurement |
| **1.** Objectives Attainment Evaluation Form<br>- Classroom Teacher<br>- Researcher<br>**2.** Expectation Form<br>- Classroom Teacher<br>- Parents | **1.** Objectives Attainment Evaluation Form (each drama workshop)<br>**2.** Interview<br>- First-grade Students<br>- Classroom Teacher<br>- Parents<br>**3.** Observation<br>- Prospective Teachers<br>- Researcher | | | | | | | | **1.** Interview<br>- First-grade Students<br>- Classroom Teacher<br>- School Administrator<br>- Parents |

As shown in Table 1, quantitative data were collected by "Objectives Attainment Evaluation Form" and qualitative data were collected with the "Expectation Form" before this study was conducted. During the creative drama activities implemented in eight workshops, the classroom teacher and the researcher made observations about the achievements in each workshop. During the application process, interviews were held with students, parents, and classroom teacher simultaneously. The researcher and prospective teachers observed the application process. At the end of this study, individual interviews were conducted with the first-grade students, classroom teacher, school administrator and parents.

### Study Group

In Türkiye, students are systematically enrolled in schools in their close environment with the "Address Based Population Registration System (ABPS)." In this way, 19 primary school first-grade students (9 girls and 10 boys) who had just started primary school and whose ages range from 66-75 months were included in the study group. The school and class in which this study took place were chosen based on easy accessibility and volunteerism (Yıldırım & Şimşek, 2016). In addition, a varied number of students' parents, one classroom teacher and one administrator as observer, and two prospective teachers took part as participant observers in this study. Before application, interviews were conducted with the classroom teacher, parents, and students who were voluntary to participate in this study. In these

interviews, the purpose of this study, how to do it, and what data collection tools to be used were explained. Prospective teachers and the researcher who graduated from the preschool and guidance department received approximately 250 hours of training in the creative drama education program and took part in many studies conducted with creative drama activities.

**Data Collection Tools**

The orientation program implemented with creative drama activities was performed between the 5th and 13th of September 2019 for seven days and 21 lesson hours in total. To determine the contributions of this study, the mixed data collection process with multiple perspectives was employed and, in this process, quantitative and qualitative data were collected together from various sources (Büyüköztürk, 2020; Creswell & Plano Clark, 2015; Yıldırım & Şimşek, 2016). To examine the research questions in-depth, understand and make sense of them, quantitative and qualitative data were used as supporters of each other in the mixed data collection process. Figure 1 illustrates the pattern regarding the data collection process and research tools.

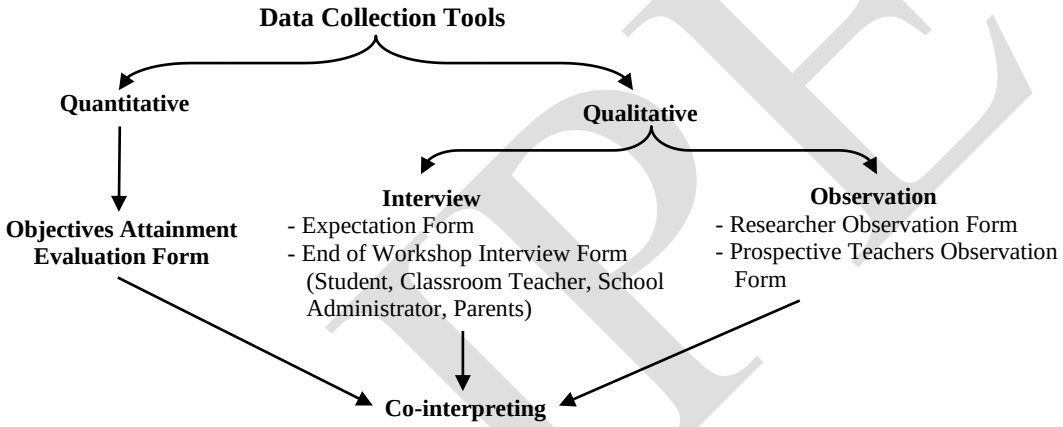


**Figure 1.** Data collection process and tools.

As Figure 1 shows, we collected the quantitative data of the research using the "Objectives Attainment Evaluation Form," and qualitative data were collected by using the "Observation" and "Interview" techniques. We collected data by observations and opinions of 19 students, one classroom teacher, one administrator, two prospective teachers, 19 parents (The number is variable as parents do not always participate), and one researcher. Detailed information about these data collection tools used before this study, during the teaching-learning process, and at the end of this research was given below.

**Objectives Attainment Evaluation Form**

The Ministry of National Education prepared a content for the orientation program in 2018 and this content was taken as the basis for the current study. The orientation program was confirmed by receiving literature support and expert opinion.

The content of the orientation program consisted of creating eight creative drama workshops, namely "Meet," "Communication-Interaction," "Orientation," "Building Trust," "Environment-Place Recognition," "Getting to Know School Staff," "Adaptation to Class and School Rules" and "Evaluation." After determining the content of the orientation program, the preschool education curriculum, primary school first-grade curriculum, and orientation programs were examined and learning outcomes of the workshop were written. The content of the orientation program and the workshop achievements were evaluated by the experts of "Curriculum and Instruction," "Assessment and Evaluation," "Creative Drama" and "Classroom Teacher," and after these examinations, rearrangements were made.

To measure these outcomes, the "Objectives Attainment Evaluation Form" was developed according to the expert opinions. To measure these outcomes, the "Objectives Attainment Evaluation Form" was

developed according to the expert opinions. In this form, the skills-related behaviors observed by the researchers were rated as "very good (5)," "good (4)," "medium (3)," "low (2)" and "bad (1)." The lowest score that can be obtained from, this form, which includes 24 items, was determined as 24, and the highest score as 120. To ensure the objectivity of the scoring process, the teacher and the researcher were allowed to observe and score the students of each other separately.

**Interview Forms**

Interviews were conducted with the participants before, during, and at the end of this study. The "Expectations Interview Form" and "End of Drama Workshops Interview Form" used in this research were developed in accordance with the expert opinions.

*a. Expectations Interview Form:* This form, developed considering the orientation program and application, National Ministry of Education orientation program, drama workshop objectives, and expert opinions included semi-structured open-ended questions. Before the creative drama workshops started, the opinions of teachers and volunteer parents were received through this form. In this form, teachers and parents were asked about the orientation training they witnessed in previous years and their expectations from this orientation training.

*b. End of Drama Workshops Interview Form:* With this form, developed considering the same elements, the opinions of primary school first-year students, classroom teacher, administrator and parents were collected. In this form, questions related to "previous orientation program activities, students' and parents' feelings and thoughts about the creative drama activities implemented in this study, and the contributions of these practices to the parties" were included. Individual interviews were held with the first-grade students, classroom teacher, and school administrator who participated in creative drama activities and written opinions were received from parents and prospective teachers (who made participant observations). Interviews with students lasted 15-20 minutes.

*c. Observation Form:* We prepared an observation form to record the students' behaviors in the workshop practices. The observation form was created using the identified objectives and expert opinions. In the observation technique, the situation, event, or phenomenon is limited to the perspective of the observer (Demir, 2011; Gülay Ogelman, 2014). To avoid such limitations, the researcher and two prospective teachers took part in this study together. Thus, they were able to observe the same activities in the same environment. The prospective teachers recorded the behaviors, situations, and other characteristics that were emerged by observing the student behaviors in the activities.

**Data Analysis**

The research data were obtained in a mixed format using both quantitative and qualitative data collection tools. Quantitative data of this study were obtained using the “Objectives Attainment Evaluation Form" filled by the classroom teacher and the researcher before the activities and at the end of each workshop. It was accepted that most of the students knew each other and the school because they live nearby the school. Thus, each student was given 1 point in the pre-test. As a result of the statistical analysis of the data obtained, the Wilcoxon Signed Ranks test (Büyüköztürk et al., 2019; Büyüköztürk, 2020), one of the non-parametric statistics, was used for the comparisons since the quantitative data did not show normal distribution and their variances were not homogeneous.

The qualitative data obtained in this research were analyzed with descriptive analysis and then content analysis. Eight workshops (titles) that constituted the scope of orientation studies conducted with creative drama activities were accepted as a theme. All qualitative data collected through interviews and observations were analyzed descriptively under these themes. The qualitative data were analyzed sentence by sentence, word by word and the concepts were coded. After these codes were organized under the themes, codes that were not related to any theme also emerged. It was noticed that these codes created new and different themes and content analysis was made on the same data and the examination process was repeated. Table 2 shows the detailed distribution of the themes obtained as a result of the descriptive and content analysis of the data obtained from the data sources.

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

**Table 2.** Themes emerging according to data sources and analysis formats.

| | | Descriptive Analysis | | | | | | Content Analysis | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***Data Sources*** | Classroom Teacher | Parents | School Administrator | Students | Researcher | Prospective Teachers | Classroom Teacher | Parents | School Administrator | Students | Researcher | Prospective Teachers |
| **THEMES** | | | | | | | | | | | | | |
| ***A. BEFORE APPLICATION*** | | | | | | | | | | | | | |
| **1. Expectation Themes** | | | | | | | | ✓ | ✓ | - | - | - | - |
| ***B. APPLICATION PROCESS*** | | | | | | | | | | | | | |
| **1. Interaction Themes** | | | | | | | | | | | | | |
| a. Communication | | - | ✓ | - | - | ✓ | ✓ | | | | | | |
| b. Become Acquainted with | | ✓ | - | - | ✓ | ✓ | ✓ | | | | | | |
| c. Confidence -Cooperation | | - | ✓ | - | - | ✓ | - | | | | | | |
| **2. School Themes** | | | | | | | | | | | | | |
| a. Noticing School | | - | - | - | ✓ | - | - | | | | | | |
| b. Getting to Know School Staff | | - | - | - | ✓ | - | - | | | | | | |
| c. Recognizing Places | | ✓ | - | ✓ | - | ✓ | - | | | | | | |
| d. Noticing the Rules | | ✓ | - | ✓ | - | ✓ | - | | | | | | |
| **3. Orientation Themes** | | ✓ | ✓ | - | - | ✓ | - | | | | | | |
| **4. Emotions Themes** | | | | | | | | ✓ | ✓ | - | ✓ | ✓ | ✓ |
| ***C. AFTER APPLICATION*** | | | | | | | | | | | | | |
| **1. Assessment Themes** | | | | | | | | | | | | | |
| a. School Activities (Orientation) | | | | | | | | - | - | ✓ | - | ✓ | ✓ |
| b. Evaluation of Activities | | | | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| c. Parent Opinions | | | | | | | | ✓ | - | ✓ | - | ✓ | ✓ |
| d. Students Opinions | | | | | | | | ✓ | - | ✓ | - | ✓ | ✓ |
| e. Prospective Teachers' Contribution | | | | | | | | ✓ | - | - | - | - | - |
| **2. Challenges Themes** | | | | | | | | | | | | | |
| a. Training Preparation | | | | | | | | - | - | ✓ | - | ✓ | ✓ |
| b. Parent Attitudes | | | | | | | | ✓ | - | - | - | ✓ | ✓ |
| c. Activities | | | | | | | | - | - | - | - | ✓ | - |

Table 2 illustrates the analyzed data under three main headings: "Before Application," "Application Process" and "Post Application." "Expectation Theme" from the data obtained before application; "Interaction, School, Orientation, Emotions Themes" from the data obtained during the application process, "Assessment" and "Challenges" themes and sub-themes emerged from the post-application data.

**Ensuring the Validity and Reliability**

We used credibility, transferability, reliability, and validity (Arastaman et al., 2018) of the reliability criteria in the qualitative dimension to provide the validity and reliability of the data. To increase the validity and reliability of this study, the literature was also examined in detail and used as a guide. In addition, orientation activities were developed according to the (MEB, 2019a) orientation program and expert opinions. To give a multidimensional perspective to this study, classroom teacher, parents, researcher, administrator and observer prospective teachers besides students participated in the activities. Using the opinions and observations of these participants, quantitative and qualitative data of this research were collected from multiple perspectives. Once more, creative drama workshop objectives and expert opinions were taken into account for the reliability and validity of data collection tools. After the activities, the validity and reliability of this study were ensured in various ways, with the harmony levels determined between the data obtained from different sources.

Before and after the creative drama activities, the classroom teacher and the researcher recorded their observations using the "Objectives Attainment Evaluation Form." These observations were rated and

scored between 1 and 5. The pre-observation scores of the classroom teacher and researchers were given a score of 1 as students live around the school and may have met before. In the last observations, the classroom teacher and the researcher scored the students separately. The comparison between these scores given by two separate observers was calculated using Miles and Huberman's (2016) consistency index.

The consistency between the pre-observation scores was determined as 1 ($p>.70$) and the consistency between the post-observation scores was .87 ($p>.70$). As a result, it was determined that the agreement between the observation scores of the classroom teacher and the researcher was high, there was consistency between the given scores, and they also gave similar scores to the students and observed similar behaviors in the students.

To ensure the reliability of the observation for this study, two prospective teachers who volunteered other than the researcher took part in this study as observer participants. The agreement between the data obtained from the observers (independently of each other) was calculated using Miles and Huberman's (2016) harmony index. The harmony between the participant observers was determined as .83 ($p<.70$). According to this result, the harmony between the observation scores was high and there was consistency between the given scores to the students.

**Creative Drama-Based Orientation Training Workshops**

MEB (2019a) orientation program activities for the first-year students who just started preschool and primary school, as well as the MEB (2018) drama program were examined, and the workshop titles and objectives were determined. While planning the events, creative drama techniques, such as improvisation, role playing and pantomime, were used. In the studies, drama techniques were supported with different methods and techniques, such as multiple intelligence, show-do-do, educational games, observation and station. In the studies, students took part in activities, such as keeping rhythm, dancing, drawing and painting. Although the applications were mainly creative drama techniques, other techniques were carried out in coordination. The practices were carried out with the participation of participant observer teacher candidates and volunteer parents.

School orientation activities consisted of "Become Acquainted with," "Communication-Interaction," "Orientation," "Confidence," "Place Recognition," "Getting to Know School Staff," "Adopting Class and School Rules" and "Assessment" workshops. Each workshop was planned according to the stages of "Warm Up, Impersonation and Evaluation." We prepared orientation activities using the creative drama method that was applied in the different places of the school, including the school garden, classroom, empty playroom, and corridors.

In the warm-up-preparation phase, educational games, activities, such as dance, rhythm and painting, were included. During the animation process, techniques, such as simple improvisation, role playing, pantomime and dramatization, were used. Parental support was received in the simple role-plays performed by the students, and the students made the animations together with their parents. The creative drama workshops organized, their stages, and the methods and techniques used are given in Table 3.

**Table 3.** Drama workshop titles, stages, and the summary of the activities.

| Creative Drama Workshops | LEARNING-TEACHING PROCESS | | | |
|---|---|---|---|---|
| | Warm Up | | Impersonation | Evaluation |
| **Workshop 1** (Meet- Parents + Student) | 1. Meet in The Circle<br>2. Clap Rhythm<br>3. Raindrops<br>4. Hands Up-Middle-Down<br>5. Say Your Name-Switch Places | 6. Show your movement<br>7. Meet Me at The Bearing<br>8. Follow the Palm<br>9. Do You Love Your Friend?<br>10. Nazife Says? | First Day at School | Verbal |

**Table 3** (Continued). Drama workshop titles, stages, and the summary of the activities.

| Creative Drama Workshops | LEARNING-TEACHING PROCESS | | | |
|---|---|---|---|---|
| | Warm Up | | Impersonation | Evaluation |
| **Workshop 2** (Communication - Parents + Student | 1. Paint Boiler<br>2. Follow Leader<br>3. The Roped Puppet<br>4. Fruit Basket<br>5. Find Your Partner<br>6. Chicken-Chick | 7. Walk-Smile-Say Hello<br>8. Meet the Parent-Student<br>9. Feature Writing - Put it on Her/His Back<br>10. Our Common and Different Aspects | How do We Get Prepared for the School? | - Fold Paper<br>-Make Contact<br>-Draw a picture-Tell |
| **Workshop 3** (Meet-Orientation - Student) | 1. Fruit Picking<br>2. Clap 1-2-3-4<br>3. Mirror Mirror<br>4. Crabs Are Moving<br>5. Reading the Newspaper | 6. Tail Snatching<br>7. Finding the Owner of the Badge<br>8. Hop Hop Jump<br>9. Keep Rhythm with the Paper Cup | Reviving Parts of a Whole | -Get Rid of the Spider Web<br>- Share Feelings and Thoughts |
| **Workshop 4 (**Confidence - Student) | 1. Walks (arm to arm-shoulder to shoulder)<br>2. Dance with the Rope<br>3. Take the Shape of the Rope | 4. Redirect with Fingers<br>5. Blind Wandering<br>6. Arm-in-Arm Walk 3 child<br>7. Caterpillar<br>8. Sing Bird Sing | Story-Dramatization | Verbal |
| **Workshop 5** (Place Recognition - Student) | 1. Walk in Class-Watch Out<br>2. Find Hidden Objects-Tap<br>3. Walk Your Friend Down The Hall | 4. Deliver Objects to its Home<br>5. Help the Puppet<br>6. Sleepy Rooster<br>7. Take a Photo | Revitalizing School Departments | -The Blanket Game<br>-Verbal |
| **Workshop 6** (Getting to Know School Staff - Student) | 1. Islands Game<br>2. I Know the Tasks<br>3. Interview<br>4. School Staffs | | Impersonate | I'm Drawing My School |
| **Workshop 7** (Evaluation-Student) | 1. The Ball of Laughter<br>2. I Want Permission<br>3. Get the Object with Permission | 4. Scream<br>5. Parasite<br>6. Our List of Rules<br>7. Colorize the Rules | Let's Follow the Rules | -Verbal<br>-Booklet of the Rules of Our Class |

Table 3 shows the summary of drama activity plans. We mainly used educational games during the warm-up phase. In the impersonation phase, simple dramatizations and role-play were planned and applied. The evaluation phase was carried out by the activities, such as verbal evaluation, painting, and educational play.

## FINDINGS

Current research examined the quantitative and qualitative findings from the observations and interviews with the students, classroom teacher, school administrator, parents, prospective teachers, and the researcher regarding creative drama activities before the application, during the application process and after the application. As a result of the qualitative data analysis obtained within the scope of this study, codes and themes emerged. Overlapping or similar codes and themes were brought together and integrated regardless of their sources. The findings of qualitative data were presented holistically in themes. The explanations for the themes were supported by quotations obtained from many data sources, including students, classroom teacher, school administrator, parents, prospective teachers and the researcher.

### Quantitative Findings

In this study, the observations were made by the classroom teacher and the researcher to complete "Objectives Attainment Evaluation Form." In this form, each learning outcome was described by an

item, and a score between 1 and 5 was given for each student. Table 4 indicates the descriptive statistics of these scores regarding the workshops.

**Table 4.** Objectives attainment evaluation form and descriptive statistic of data.

| CREATIVE DRAMA WORKSHOPS | | | Become acquainted with | Communication-interaction | Orientation | Confidence | Place recognition | Getting to know school staff | Adopting class and school rules | |
|---|---|---|---|---|---|---|---|---|---|---|
| OBJECTIVES ATTAINMENT | | | 1. Introduces herself/himself<br>2. Tells the name of classmates<br>3 Tells the basic characteristics of classmates<br>4. Cooperates with classmates<br>5. Parents participate in the workshops | 6. Study with classmates<br>7. Communicates with other participants<br>8. Expresses oneself within the group | 9. Introduces herself/himself<br>10. Tells the name of the group<br>11. Communicates with other participants<br>12. Expresses oneself within the group<br>13. Acts in harmony with the group | 14. Explains/says the importance of working together<br>15. Develops confidence in oneself and classmates<br>16. Cooperates with classmates | 17. Finds one' s own class<br>18. Show tools that can be used within the class | 19. Introduces the units of the school<br>20. Tells that school employees do different tasks | 21. Takes part in the determination process of the class rules<br>22. Tells the problems that will be encountered when he doesn' t follow the rules<br>23. Tells the rules to be followed in the classroom<br>24. Obeys the rules. | **Mean** |
| MEASUREMENTS | Teacher Before | Mean | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | | Std.Dev | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | Teacher After | Mean | **2.58** | 3.37 | 3.42 | 2.86 | **4.50** | 3.58 | 3.71 | **3.45** |
| | | Std.Dev | .74 | .94 | .78 | .80 | .50 | .80 | .90 | .64 |
| | Researcher Before | Mean | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | | Std.Dev | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| | Researcher After | Mean | **2.63** | 3.30 | 3.43 | 2.93 | **4.50** | 3.66 | 3.72 | **3.43** |
| | | Std.Dev | .72 | .89 | .78 | .80 | .50 | .71 | .94 | .65 |

As shown in Table 4, the pre-test observation points averages of the classroom teacher and the researcher were 1.00. The classroom teacher's post-application observation point average was 3.45; the researcher's observation was 3.43. Table 5 shows the findings obtained from the comparisons regarding whether there was a significant difference between these observations scores.

**Table 5.** The analysis of the scores obtained from the Objectives Attainment Evaluation Form with the Wilcoxon Signed Ranks Test.

| Creative Drama Workshops | First-End | N | Rank Average | Rank Total | Teacher Z | Teacher p | Researcher Z | Researcher p |
|---|---|---|---|---|---|---|---|---|
| Become Acquainted with | Negative order | 0 | | | -3.826 | .000 | -3.828 | .000* |
| | Positive order | 19 | .00 | .00 | | | | |
| | Same | 0 | 10.00 | 190.00 | | | | |
| | Total | 19 | | | | | | |
| Communication-Interaction | Negative order | 0 | | | -3.829 | .000 | -3.833 | .000* |
| | Positive order | 19 | .00 | .00 | | | | |
| | Same | 0 | 10.00 | 190.00 | | | | |
| | Total | 19 | | | | | | |

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

**Table 5** (Continued). The analysis of the scores obtained from the Objectives Attainment Evaluation Form with the Wilcoxon Signed Ranks Test.

| Creative Drama Workshops | First-End | N | Rank Average | Rank Total | Teacher Z | Teacher p | Researcher Z | Researcher p |
|---|---|---|---|---|---|---|---|---|
| Orientation | Negative order | 0 | | | -3.828 | .000 | -3.830 | .000* |
| | Positive order | 19 | .00 | .00 | | | | |
| | Same | 0 | 10.00 | 190.00 | | | | |
| | Total | 19 | | | | | | |
| Confidence | Negative order | 0 | | | -3.830 | .000 | -3.833 | .000* |
| | Positive order | 19 | .00 | .00 | | | | |
| | Same | 0 | 10.00 | 190.00 | | | | |
| | Total | 19 | | | | | | |
| Place Recognition | Negative order | 0 | | | -3.874 | .000 | -3.874 | .000* |
| | Positive order | 19 | .00 | .00 | | | | |
| | Same | 0 | 10.00 | 190.00 | | | | |
| | Total | 19 | | | | | | |
| Getting to Know School Staff | Negative order | 0 | | | -3.843 | .000 | -3.841 | .000* |
| | Positive order | 19 | .00 | .00 | | | | |
| | Same | 0 | 10.00 | 190.00 | | | | |
| | Total | 19 | | | | | | |
| Adopting Class and School Rules | Negative order | 0 | | | -3.840 | .000 | -3.833 | .000* |
| | Positive order | 19 | .00 | .00 | | | | |
| | Same | 0 | 10.00 | 190.00 | | | | |
| | Total | 19 | | | | | | |

* p<.05

As shown in Table 5, there was a significant difference between the pre-test and post-test scores of both the teacher and the researcher in favor of the post-test in all workshops. These findings revealed that creative drama activities were efficient in confirming students' orientation to school.

**Qualitative Findings**

The themes and sub-themes that emerged from the qualitative data analysis obtained from the opinions and observations of the students, classroom teacher, school administrator, parents, prospective teachers, and the researcher before, during, and after the orientation activities carried out in this study were given.

**Before Application**

Before the orientation activities, the primary school first-grade teacher and parents expressed their attitudes toward the orientation activities. The findings suggest the "Expectation" theme based on their attitudes.

**1. Expectation Theme**

The following question was asked to the classroom teacher and parents: “What are your expectations as a teacher/parent from the orientation activities to be carried out?” Sample opinions about "Expectation Themes" which emerged from the answers they gave to this question were given below.

> *“… I want our students to adapt to the school as soon as possible. I want children to adapt to the school easily, to see the school as their home, and parents to have more confidence in the school and teachers.” (Classroom Teacher)*
> *“…I want my child to like his friends.” (10 Parents)*
> *“…I want my child to adapt to the school and the teacher and to love the school.” (17 Parents)*

Classroom teacher and parents stated that they had expected the orientation program to contribute to the orientation of the students to the school. While the teacher was waiting for the support of the parents in this process, the parents preferred their children to adapt easily to their teacher, friends and the school.

**Application Process**

The findings regarding the themes of "Interaction, School, Orientation, Emotions" that emerged during the application process are given below, respectively.

**1. Interaction Theme**

Figure 2 shows that the research findings regarding the "Interaction Theme" attained from the orientation activities carried out with the creative drama activities and the sub-themes of "Recognition," "Communication" and "Cooperation-Confidence" emerged.

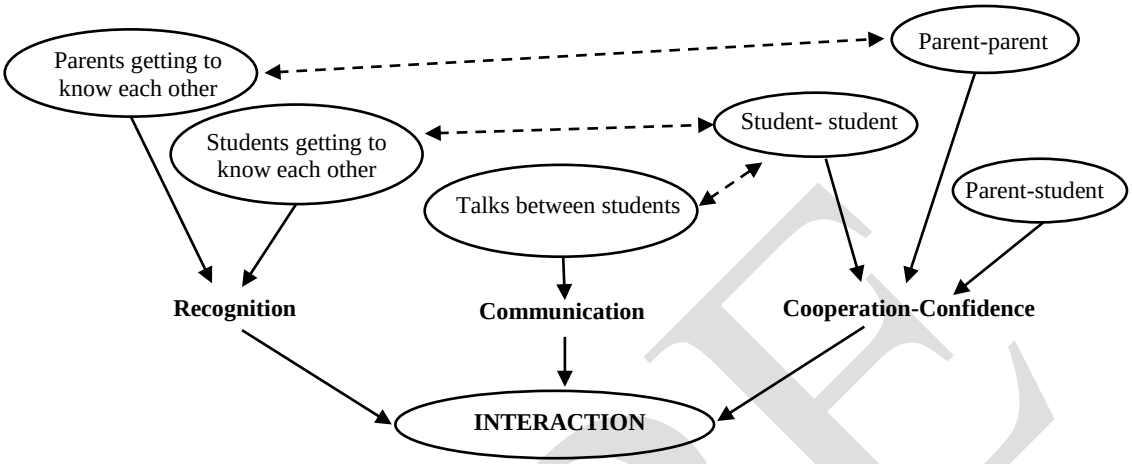


**Figure 2.** Sub-themes of the interaction theme.

As shown in Figure 2, we employed pupil orientation activities with creative drama activities that positively contributed to the mutual recognition and interaction of students and parents.

> *"...parents and children had the opportunity to recognize each other in this process." (Classroom Teacher)*
> *"...the children who got to know each other through the activities also met different children in the group." (Researcher)*
> *"...they were given the opportunity to get to know each other..." (Parent-6)*
> *"...child and parent together..." (Parent-10)*

Current research revealed that the stakeholders developed positive interactions with each other.

**2. School Theme**

We investigated data obtained through interviews and observations on orientation activities and the sub-themes of "noticing the school," "recognizing places and getting to know the staff " and "noticing the rules" emerged. We asked the students regarding the sub-theme of noticing the school like what they thought about the school and what they did to get prepared for the school before they started. The students described the school as a place where they only study (n=4) and learn to read and write (n=1). In addition, before starting school, most students did not know what the school was like (n=6) and did not get prepared for the school (n=7), while some students had visited the school before (n=5). After the orientation activities, they stated that the school is a fun (n=11), beautiful (n=10), gigantic (2) place. After the application, the students expressed they toured the school with games, got to know them better, and had a break.

We collected the qualitative data from the thoughts and observations of classroom teacher, parents, school administrator and researchers. In the next subtheme of recognizing places and getting to know the staff in the school, the data from classroom teacher, parents, school administrator and the researcher were handled together and the quotations obtained from the opinions of them regarding these findings are shown below.

> *"...the students recognized the class, the school and the parts of the school like a game..." (Classroom Teacher)*
> *"...the activities you have done in different areas of the school have been effective in the child's recognition of the school and the places in the school..." (School Administrator)*
> *"...she talks about the process that takes place at school as soon as you leave school. Her eyes sparkled when she said, "Do you know mom, our school is very big." (Parent-5)*

*"…they had a lot of fun and learned the duties of their staff at school. They learned who to find in an emergency…" (Researcher)*

In the sub-theme of noticing the rules, we observed that the students learned the classroom and school rules in general, but some had difficulty complying with the regulations created through the activities. These students behaved negatively as speaking without permission, some of the students wanted everybody to listen to themselves only, get out of their seats, and speak in a different place. The following workshops were reorganized for these undesirable behaviors, game and drama technique studies were conducted, finally it was revealed that these behaviors decreased visibly.

It was determined that the orientation studies implemented with drama activities contributed positively to the students' love of the school, their enjoyment at the school, and their willingness to come to the school. Also, the students discovered and got to know the places and staff at the school by having fun, explained the activities completed in and outside the school, and understood that there were many different environments at the school and these environments had different functions. We observed that the students' perceptions about the school improved positively with these activities.

**3. Orientation Theme**

We integrated the codes that emerged from the qualitative data obtained through interviews and observations under the theme of "Orientation Theme." Twelve parents stated that the children adapted to the school, eleven parents said that the children got used to the school, seven stated that they were integrated into the school. Two parents stated that the children now enjoyed going to school regarding the contribution of the activities to the children. Moreover, it was revealed from these views that students gradually distanced themselves from their parents and came to school independently and willingly. Sample expressions from the views of parents, classroom teacher, and researchers on the theme of orientation were given below.

*"… my child says she/he wants to go to school…" (Parent-12)*
*"…in this process, we not only had fun, but while we were having fun, our students got to know our school and socialized with their friends…" (Classroom Teacher)*
*"... they also spend time with each other during breaks..." (Researcher)*

The findings indicated that the activities increased the students' desire to go to school and provided the opportunity to get to know the school and enabled them to socialize and communicate with other students in their class. Thus, it has been seen that the activities support the orientation of students to school in various aspects, especially social, affective, and psychomotor.

**4. Emotions Theme**

We reached the theme of emotion by examining the opinions of the participants. This study revealed that the students and the parents experience various emotions, such as being happy, excited, and proud of starting the school. In addition, the parents also conveyed their observations, supporting the feelings expressed by the children. Therefore, the theme of emotions was given under two sub-themes, namely "student" and "parent" feelings.

Regarding ***the students' feeling the sub-theme***, "How did you feel about the school?" was asked to the students before and after the activities. We analyzed their answers. Also, the parents said, "In the activities we have done today, my child felt...." responded to the opinion forms. Figure 3 shows the findings obtained from these interviews.

IOJPE
ISSN: 1300 – 915X
www.iojpe.org
International Online Journal of Primary Education 2024, volume 13, issue 1

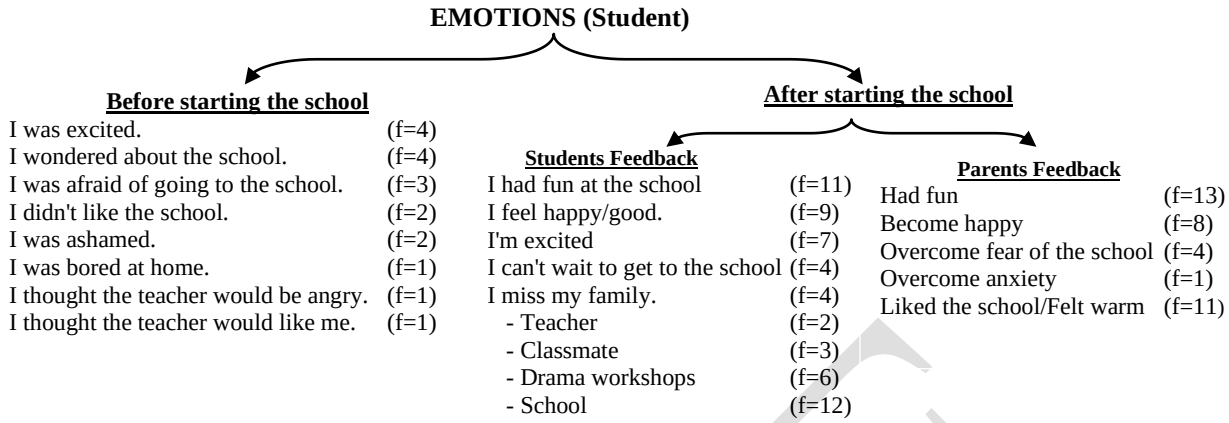


**Figure 3.** Students' opinions on the theme of emotions.

As Figure 3 illustrates, the students were afraid of going to school and did not like the school before. Also, they were worried, and they thought that the teacher would not love them. Despite the negative feelings and thoughts, there were students who were excited and curious about school because they were going to start the school. Orientation activities carried out after they started the school increased the positive emotions of students, such as enjoying the school, being happy at the school, and being impatient to come to the school while reducing their negative emotions. Similar to students' views, parents also stated that the children had fun, they were happy, they felt warm towards the school, and they loved it. Thus, they did not feel anxiety about the school, and they overcame their fear of the school.

Regarding the sub-theme of the parents' own feelings, after this study, the researcher made the parents tell, "In the activities, we have done today; I felt .... The findings regarding the feelings of the parents obtained from the semi-structured interview form are given in Figure 4.

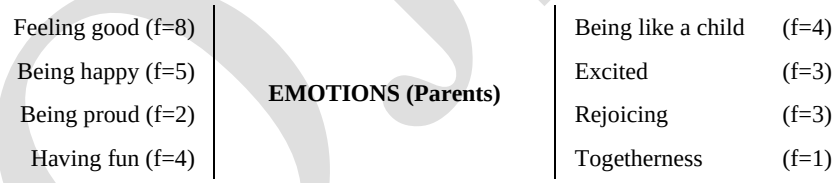


**Figure 4.** Parents' opinions on the theme of emotions

Figure 4 displays that the parents stated that they felt good, happy, proud, and excited after the activities. They said they had fun in the activities by feeling like children; they felt together with other participants. The views of the parents on their feelings are as follows:

*"...I felt very good and very happy."*
*"...I felt good; we are as excited as our children."*
*"...I remembered my first day at school; I went back 40 years."*

We noted below the opinions and observations of classroom teacher, prospective teachers and researcher regarding the emotions they observed in students and parents.

*"...also, our students who came before you are eagerly waiting for you..." (Classroom Teacher)*
*"...the students seemed uneasy in the first days of school, but now they come to school with a smile on their face. Besides they are looking forward to the next day's activities..." (Researcher)*
*"...the students and their parents are smiling. They come to school with pleasure..." (Prospective Teacher)*

Stakeholders stated that the students participating in the creative drama activities confirmed that they came to school with pleasure, happiness, excitement, and willingness. In addition, students said that they

felt good at school and were looking forward to going to the school. Also, parents who participated in the activities were happy, proud, satisfied, and returned to their childhood because they experienced this process with their children. According to the attitudes of the students, parents, classroom teacher, prospective teacher, and the researcher, the family-teacher-students developed positive feelings towards school in the workshops.

**After Application**

After we carried out the orientation activities with creative drama activities, we evaluated the data collected from the students, classroom teacher, school administrator, parents, prospective teachers, and researcher, and the themes of "Assessment and Limitations-Challenges" emerged. The themes and sub-themes are given below.

**1. Assessment Theme**

As a result of the examination of the data obtained from the classroom teacher, school administrator, parents, prospective teachers and researcher, sub-themes "School Activities (Orientation)," "Evaluation of Orientation," "Parents Opinions," "Students Opinions" and "Prospective Teachers' Contribution" emerged. We explained the findings and attitudes regarding these sub-themes below.

Regarding the sub-theme School Activities for Orientation, the class teacher and school administrator stated that in the previous years, mostly short-term recognition games were played within the "giving gifts" and "welcome" activities to the students in the orientation program. In addition, they stated that they held informative meetings with the parents to determine the students' needs, but the parents generally did not participate in the orientation process activities. The school administrator stated the difference between the orientation activities carried out in previous years and the orientation activities based on creative drama as "The work we have done did not include such a play process as your activities. The activities you have done are different and the ones that involve the students in the process."

We evaluated the contribution of orientation activities carried out with creative drama from various aspects, from the observations and opinions of the classroom teacher, school administrator, parents, prospective teachers, and researcher. According to the classroom teacher's evaluation of these activities, the students took an active role in the activities, the game was used as a tool, and the students had fun. In addition, the school administrator stated that it was appropriate for its purpose, effective regarding education and training, and it was carried out as multidimensional with the participation of parents. According to the parents who evaluated the teaching-learning process, it was revealed that they were satisfied with the attention shown to the children (5 parents) and the activities (9 parents). In addition, the parents who participated in the study stated that these studies were different (3 parents) from the previous ones, useful/productive (8 parents) and they also expressed that the activities carried out were nice/good (4 parents) and effective (2 parents). The parents stated that the activities made positive contributions to the development of the students in various areas, such as physical (3 parents), mental (1 parent), self-confidence (2 parents), and empathy (3 parents). As a result of the assessment of the activities by the prospective teachers and the researcher, it was determined that they are beneficial for children to love the school and come willingly, socialize with each other, increase their interaction and communication, gain confidence in themselves and the school, get used to school and overcome their fear of school.

It was determined that the orientation activities increased curiosity and interest in students and were effective in adapting students to school and affected their emotions positively according to the opinions and observations of classroom teacher, school administrator, parents, and prospective teachers. In addition, the activities made each student active and provided effective communication and interaction between students, increased the ability to express themselves, and helped the students develop positive impressions about the school. The students reached the content that constitutes the orientation program through play processes, such as "become acquainted with, communication-interaction, orientation, confidence, place recognition, getting to know school staff, adopting class and school rules and

assessment." Moreover, these studies supported the physical, social and emotional development of students and developed empathy in parents.

Another dimension of this study was the parents participating in the activities. The classroom teacher, school administrator and researcher observed the parents throughout this study. According to these observations, the parents noticed the researcher and prospective teachers as a part of the school, found the activities interesting. While they first hesitated in the activities, they later joined voluntarily and had fun. In addition, the parents stated that the orientation studies were effective in the orientation of the students to the school.

The classroom teacher, prospective teacher, and researcher monitored and interviewed students during the creative drama activities. At the beginning of the activities, the students were shyness, hiding behind the parents, and cannot leave the parents. This research indicated that the activities disregarded such negative behaviors, and students developed positive attitudes and behaviors toward school. It was stated that the students were happy to participate in the orientation activities with drama, they saw the activities like games, and they looked forward to continuing the activities. Also, the attitudes observed in the students in the first days of the study like shyness, speaking in a low voice, and staying close to their parents decreased visibly at the end of this study. In addition, the behaviors, such as desire to go to school, to love school, asking questions about activities, and being close to researchers and prospective teachers developed. It was also determined that prospective teachers gained professional experience from these studies and contributed positively to their professional careers in terms of meeting and interacting with students.

> *"…I learned that they received drama education while talking to friends… The sooner they are introduced to the school environment, the more productive they will be…" (Classroom Teacher)*
>
> *"…these studies that I participated in provided a preliminary preparation for my future and offered the opportunity to broaden my perspective… it was an experience… it was enjoyable." (Prospective Teacher)*

We examined the attitudes of classroom teachers, and prospective teachers. The data showed that prospective teachers learned about what the orientation program was, how the program would be implemented and how it would be evaluated. The study enabled prospective teachers to gain professional experience in terms of observation and participation. The other stakeholders also stated that the prospective teachers were happy to be a part of the research process and they closely observed the research process. With multi-faceted interaction, the prospective teachers contributed easily to the application of creative drama activities, the coordination of students and parents, the elimination of problems in the process, and the one-to-one care with students.

**2. Challenges-Limitations Theme**

Creative drama activities emerged with multiple perspectives, which facilitates the orientation of first-grade primary school students to school. Besides the positive contributions of creative drama activities, we also encountered various problems during the application process. When children reached the age to start primary school, the ABPS automatically enrolled them in the school closest to their home. Parents were either not informed about this registration process or they were informed very late, which caused students not being able to attend the orientation activities held during the school adjustment week, the late arrivals missed the integration activities, and thus the late adjustment to the school occurs.

During orientation activities, the desks in the classroom narrowed the range of activities, so the creative drama activities considered to be in mutual interaction could not be carried out. Thus, the studies were conducted in the school garden. However, the school garden was available to all classes and parents distracted the students during the practices. Since the students at other levels wanted to watch the activities, it was not possible to move comfortably in the place where this study was managed. In addition, changes were made to the planned games since the ground of the school garden was not proper for the activities.

The students' classroom teacher did not participate in the creative drama practices and observed the practices remotely. This situation caused first-year students to feel closer to the researcher who conducted the application and the teacher candidates who supported the applications. This problem delayed them from getting to know their classroom teachers, getting along and generally adapting to each other.

The classroom teacher, teacher candidate, and researcher monitored the positive and negative attitudes of the parents and their effects on the students through creative drama. The parents who actively participated in the practices and did not interfere with their own children and other students, respected students' own decisions, and shared the excitement with the students were evaluated as holding at positive attitude. However, some of the parents ignored children's feelings, some of the parents wanted to stay with their children in the classroom, spoke instead of their children and intervened the process unnecessarily, became overprotective and forced them to participate in activities. These behaviors indicated the negative attitudes of the parents.

These problems should also be considered within the limitations of this research. It was determined as an important limitation that especially the classrooms in schools were not suitable for creative drama activities and therefore orientation training.

The fact that schools and teachers do not have a written program or plan regarding orientation training and that teachers try to carry out orientation training with their past habits has negatively affected the effects of different student-centered practices, such as creative drama.

The lack of a study by the school or national education to raise the awareness of parents of first-grade students led to communication conflicts, especially between parents and practitioners, in the implementation of creative drama activities.

All these situations were considered obstacles to the proper conduct of this research and problems, such as inadequacy of spaces, indifference of teachers, and lack of a planned orientation program, were foreseen and the creative drama process was planned and implemented as a solution to these problems. However, unforeseen and spontaneous situations, especially parents' involvement in the process, lack of information about orientation training, students having difficulties registering through the system, attending orientation training late or not attending it at all are important problems. However, the fact that the class in which the students would study was not clear from the beginning and the children constantly changed branches (classes) have emerged as the most important problem that could be encountered in orientation education.

## DISCUSSION, CONCLUSION, and SUGGESTIONS

The orientation program consisting of "Become Acquainted with, Communication-Interaction, Orientation, Confidence, Place Recognition, Getting to Know School Staff, Adopting Class-School Rules and Assessment" workshops was organized through using creative drama activities. The attitudes of all the participants indicated that the creative drama activities contributed to the orientation of the students to the school.

Creative drama activities carried out together with communication, cooperation, trust, and interaction between student-parent-teacher had a positive effect on students' orientation to the school. It was determined that the difference between the pre-post observation scores of the orientation studies carried out was statistically significant ($p<.05$), which supports that this study achieved its purpose.

The findings obtained by examining the opinions and observations of students, teachers, administrator, parents and prospective teachers showed that orientation activities were attractive and orientation program has the features that stimulate emotions, and support students' and parents' development (Tam, 2021). In addition, the behaviors of the participants indicated that the creative drama activities were a holistic process that positively affected the participants mentally, physically, and emotionally. Çeliktürk (2011), Hui and Lau (2006), Tam (2016), and Taşçı and Dikici Sığırtmaç (2014) said that the integration

activities allow students to get to know each other, the school's units, teachers, parents, and school personnel.

The attitudes of all stakeholders showed that creative drama orientation activities strengthened the interaction between teachers, parents, and students. It also contributed positively to the skills, such as acting together, working in cooperation and getting used to the classroom teacher.

This study supported the idea that creative drama activities improved cooperation, self-control, social and life skills in previous studies in literature. In addition, it reduces the students' problematic behaviors, prejudges (Akhan et al., 2018; Akhan & Arık Karamık, 2019; Altıntaş, 2015; Aktaş et al., 2019; Bulut Özsezer, 2019; Demir, 2019; Akhan & Demir, 2020; Demir et al., 2020; Köksal Akyol, 2019; Şeren, 2021; Temel & Sapsağlam, 2018).

This study proved that the students who regularly participated in orientation activities behaved comfortably at school, came to school with pleasure, and adapted to school more easily. On the other hand, students who could not participate in the studies regularly behaved timidly. They had difficulty in getting used to school, friends and teachers and it was noticed that they had problems in initiating and maintaining activities. Some of the studies conducted on the orientation program, showed that when students do not participate in their activities regularly, they experience problems, such as not being able to communicate, not expressing themselves, starting and maintaining activities and daily life. It has been seen that there are problems that make it difficult to adapt to school (Borbélyová et al., 2018; Boriones, Gallego & Palomera, 2022; Güner & Kartal, 2019; Taşçı & Dikici Sığırtmaç 2014; Yalçın, 2017).

According to the views of the parents who actively participated in this study, children easily adapted to the school and loved the school. Besides, the parents were pleased to participate in such a program, and they knew the other parents and the teacher closely. Many other studies indicate that family participation gives confidence to the student and facilitates the student's orientation to the school (Correia & Marques-Pinto, 2016; Osher et al., 2010; Zupancic & Kavcic, 2011).

Participation of prospective teachers as participant observers in this study offered them the opportunity to have a different experience and improve their teaching skills. This result, which emerged as a latent product of this study, reveals the importance of the hidden curriculum in improving the teaching skills of teacher candidates. This result is significant in that it is consistent with the results of the research conducted by Köse (2023) and Özaslan (2019), which show the place of the hidden curriculum in teacher training. Also, the contribution of prospective teachers facilitated the research process and supported the research findings with their unbiased observations and opinions.

**Suggestions**

Current study supported that creative drama activities help students adapt to school and improve their social and affective skills. Based on this meaningful result, we developed the following recommendations. Orientation activities integrated with creative drama increase social skills, such as communication, cooperation and facilitate school orientation by supporting emotional development. Thus, studies on orientation to school should be revised with creative drama activities.

Creative drama activities increase the school-family cooperation and support the orientation of the students to the school. Therefore, before the orientation week, orientation activities based on creative drama activities between parents should be planned and implemented.

In the process of application of the orientation programs, the parents of the primary school first-grade students should be deemed to be on leave by their workplaces and their participation in the orientation programs should be ensured.

Primary school first-grade teachers should attend in-service training courses on creative drama to improve skills among students, such as communication, interaction, cooperation, and orientation to school. Orientation programs applied should be developed, planned, implemented, and evaluated by student-centered methods, such as creative drama in primary schools.

The period of the orientation program prepared by the Ministry of National Education can be extended and this period can be rearranged as at least five days and 15 lesson hours. Orientation activities should be integrated with primary school first-grade lessons and continued for at least two weeks. School-university interaction should be increased by ensuring that prospective teachers take part in orientation programs, and projects that will contribute to the professional development of teacher candidates should be developed. Activities and projects should be prepared in education faculties to improve the knowledge and skills of teacher candidates on how to conduct orientation training or this subject should be included in programs as an independent course. Finally, education faculties and national education directorates should work in cooperation for the orientation training of new students. Teacher candidates trained in education faculties should be ensured to participate in this orientation training.

**Ethics and Conflict of Interest**

This article was produced from the master's thesis titled "Development of Primary School Students' Adaptation to School with Creative Drama". This study was conducted between 5-13 September 2019 before the ethical rules were applied at the university. Despite this situation, necessary permissions were obtained for the present study from the Burdur Provincial Directorate of National Education through the Institute of Educational Sciences of Burdur Mehmet Akif Ersoy University/Türkiye, with the approval of the governorship dated 09 August 2019 and numbered "39958266-605.01-E.14730879." In addition to the permissions above, the applications were made after informing the school administrator, classroom teacher, students' parents and primary school first-grade students. There is no conflict of interest between the authors.

**Author Contributions**

The authors contributed equally to this study, 50% and 50%.

**Corresponding Author**

Correspondence to Kenan DEMİR, kenandemirkfe@gmail.com

**REFERENCES**

Adıgüzel, Ö. (2019). *Eğitimde yaratıcı drama* [Creative drama in education]. İstanbul: Yapı Kredi Publishing.

Akhan, N. E., & Arık Karamık, G. (2019). Ensuring adaptation of first-year students at the faculty of education to university through creative drama. *The Journal of Education, Theory and Practical Research (JETPR), 5*(2), 141-152.

Akhan, N. E., & Demir, K. (2020). Supporting the adaptation process to the faculty of social studies teacher candidates with creative drama. *Mehmet Akif Ersoy University Journal of Education Faculty, 53*, 266-292.

Akhan, N. E., Acar, H., & Güngör, B. (2018). Metaphorical perceptions of first-year students at faculty of education before and after the university orientation program. *Eurasian Journal of Social and Economic Research (EJSER*), *5*(12), 174-194.

Akis, G. (2018). Okul oncesi egitim kurumlarına devam eden 5-6 yaş grubu cocukların okula uyumlarını yordayan degiskenlerin incelenmesi [Investigation of variables predicting the school adaptation of 5-6 years old children attending preschool education institutions] (Unpublished master thesis). Selcuk University.

Aktaş Arnas, Y., Sarıbaş, Ş., & Yaşar, M. (2019, October). *Drama activities in the context of classroom adaptation and social relations* [Oral Presentation]. Uluslararası Eğitimde Yaratıcı Drama Kongresi [30. International Congress on Creative Drama in Education], Çukurova University, Adana, Turkey.

Altıntaş, E. (2015). *Birinci sınıflarda uygulanan uyum ve hazırlık çalışmalarının öğretmen görüşlerine göre değerlendirilmesi* [Evaluation of adaptation and preparation studies applied in first classes according to teachers' views] (Unpublished doctoral dissertation). Recep Tayyip Erdoğan University.

Arastaman, G., Fidan, İ. Ö., & Fidan, T. (2018). Nitel araştırmada geçerlik ve güvenirlik: Kuramsal bir inceleme [Validity and reliability in qualitative research: A theoretical analysis]. *Van Yuzuncu Yıl University Journal of Education Faculty*, *15*(1), 37-75.

Ateş, E. Ş. (2016). *Sınıf öğretmenlerinin ilkokul 1. sınıfa devam eden öğrencilerin okula uyumlarına ilişkin görüşleri: Ankara ili Çubuk ilçesi örneği* [Teachers' observations on first year elementary students' adaptation to the school (an empirical study of Çubuk District of Ankara)] (Unpublished master thesis). Gazi University.

Baldwin, P., & Galazka, A. (2022). *Process drama for second language teaching and learning*. London: Bloombury Academic.

Barlow, W. D. (2019): 'We ur al aff tae th' big schuil' – pupils' and teachers' views and experiences on using Drama Conventions to support primary-secondary transition, *Education 3-13,* 1-16. http://doi.org/10.1080/03004279.2019.1668819

Bascoe, S. M., Davies, P. T., Sturge-Apple, M. L., & Cummings, E. M. (2009). Children's representations of family relationships, peer information processing, and school adjustment. *Developmental psychology*, *45*(6), 1740.

Batdi, V., & Elaldi, S. (2020). Effects of drama method on social communication skills: A comparative analysis. *International Journal of Research in Education and Science*, *6*(3), 435-457.

Bay, D. N., & Şimşek Çetin, Ö. (2014). Passing problems from kindergarten to primary school and alternative implementation recommended. *The Journal of Academic Social Science Studies International Journal of Social Science, 30*, 163-190. http://doi.org/10.9761/JASSS2598

Borbélyová, D. (2017). Adaptation to the school environment in early elementary education. *Paidagogos-Journal of Education in Contexts*, 2, 206-228.

Borbélyová, D., Slezáková, T., Tirpáková, A., & Kurucová, Z. (2018). Using an adaptation program to introduce children to the early years of schooling in Slovakia, Education. *International Journal of Primary, Elementary and Early Years Education 3-13, 47*(6), 1-16. http://doi.org/10.1080/03004279.2018.1531045

Briones, E., Gallego, T., & Palomera, R. (2022). Creative Drama and Forum Theatre in initial teacher education: Fostering students' empathy and awareness of professional conflicts. Teaching and Teacher Education, 117, 103809.

Brown, V. (2017). Drama as a valuable learning medium in early childhood. *Arts Education Policy Review, 118*(3), 164-171. http://doi.org/10.1080/10632913.2016.1244780

Bulut Özsezer, M. S. (2019, October). *A drama practice to improve social adjustment in the classroom* [Oral Presentation]. Uluslararası Eğitimde Yaratıcı Drama Kongresi [30. International Congress on Creative Drama in Education], Çukurova University, Adana, Turkey.

Büyüköztürk, Ş. (2020). *Sosyal bilimler için veri analizi el kitabı* [Manual of data analysis for social sciences]. Ankara: Pegem Publishing.

Büyüköztürk, Ş., Kılıç-Çakmak, E., Akgün, Ö., Karadeniz, Ş., & Demirel, F. (2019). *Eğitimde bilimsel araştırma yöntemleri* [Scientific research methods in education] Ankara: Pegem Publishing.

Carida, H. C. (2011). Planning and implementing an educational programme for the smooth transition from kindergarten to primary school: The Greek project in all-day kindergartens. *The Curriculum Journal, 22*(1), 77-92. http://doi.org/10.1080/09585176.2011.550800

Çeliktürk, Z. (2011). *İlköğretim birinci sınıfa uyum haftasına ilişkin öğretmen ve veli görüşleri* [The views of teachers and parents to the first grade of primary school adaptation week] (Unpublished master thesis). Anadolu University.

Ceylan, R., Gök Çolak, F., & Demir, B. (2019). The effect of drama activities on five-year-old children's social skills. *Educational Research and Reviews, 14*(12), 434-442. http://doi.org/10.5897/err2019.3739

Chi, S. A, Kim, S. H., & Kim, N. H. (2018). A study of school adjustment related variables of young children. *South African Journal of Education, 38*(2), 1–9.

Coelho, V. A., Marchante, M., & Jimerson, S. R. (2017). Promoting a positive middle school transition: A randomized-controlled treatment study examining self-concept and self-esteem. *Journal of Youth and Adolescence, 46*(3), 558-569. http://doi.org/10.1007/s10964-016-0510-6

Cokuk, K., & Kozikoglu, I. (2020). School adaptation problems of primary school students in mixed-age classrooms. *Research in Pedagogy, 10*(1), 13-31.

Çomakli, M., & Koçyigit, S. (2021). Primary school adaptation problems of children: Parental experiences and practices. *Psycho-Educational Research Reviews, 10*(2), 176-193.

Cook, K. D. & Coley, R. L. (2017). School transition practices and children's social and academic adjustment in kindergarten. *Journal of Educational Psychology, 109*(2), 166-177. http://doi.org/10.1037/edu0000139

Cook, K. D., Coley, R. L. & Zimmermann, K. (2019). Who benefits? Head start directors' views of coordination with elementary schools to support the transition to kindergarten. *Children and Youth Services Review*, 100, 393-404. http://doi.org/10.1016/j.childyouth.2019.03.021

Correia, K. & Marques-Pinto, A. (2016) Adaptation in the transition to school: Perspectives of parents, preschool and primary school teachers, *Educational Research, 58*(3), 247-264, http://doi.org/10.1080/00131881.2016.1200255

Creswell, J. W. (2021). *A concise introduction to mixed methods research*. California: SAGE Publishing.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches*. California: SAGE Publishing.

Creswell, J. W., & Plano Clark, V. L. (2015). *Karma yöntem araştırmaları tasarımı ve yürütülmesi* [in Turkish] (Y. Dede & S. B. Demir, Trans. Ed.). Ankara: Anı Publishing (Original work published 2003).

de Moura Pereira, V. A. B., & Figueira, A. P. C. (2011). Project" Positive Attitude": Promoting school success through social and emotional abilities development. Design for elementary and middle school students, in Portugal. *Interamerican Journal of Psychology*, *45*(2), 185-191.

Demir, K. (2019). Evaluation of adaptation studies implemented by creative drama activities. *Creative Drama Journal*, *14*(1), 161-180. http://doi.org/10.21612/yader.2019.008

Demir, K., Savaş, B., & Türkel, A. (2020). Kırsal kesim yaşam becerileri ve yaratıcı drama [in Turkish], Onur Zahal (Ed.), *Eğitim Bilimleri Alanında Akademik Çalışmalar* [in Turkish] (pp. 319-337). Gece Kitaplığı.

Demir, O. Ö. (2011). Nitel araştırma yöntemleri [in Turkish]. K. Böke (Ed.), *Sosyal bilimlerde araştırma yöntemleri* [in Turkish] (pp. 287-318). Istanbul: Alfa Publishing.

Dockett, S., & Perry, B. (2003). The transition to school: What is important? *Educational leadership: journal of the Department of Supervision and Curriculum Development, N.E.A60*(7), 30-37.

Emig, C., Moore, A., & Scarupa, H. J. (2001). School readiness: Helping communities get children ready for school and schools ready for children. *Child Trend.* Retrived from *https://www.childtrends.org/publications/school-readiness-helping-communities-get-children-ready-for-school-and-schools-ready-for-children-2nd-printing*

Folostina, R., Tudorache, L., Michel, T., Erzsebet, B., Agheana, V., & Hocaoglu, H. (2015). Using play and drama in developing resilience in children at risk. *Procedia-Social and Behavioral Sciences*, *197*, 2362-2368.

Freeman, G. D. & Ray-Fulton, K. S. C. (2003). Effects of creative drama on self-concept, social skills and problem behavior. *The Journal of Educational Research*, *96*(3), 131-138.

Gao, Q., Hall, A., Linder, S., Leonard, A., & Qian, M. (2022). Promoting head start dual language learners' social and emotional development through creative drama. *Early Childhood Education Journal*, *50*(5), 761-771.

Göktaş, İ., & Gülay Ogelman, H. (2019). Examining the predictor effect of the teacher-student relationships on school adjustment levels of students in preschool education. *International Anatolia Academic Online Journal*, *5*(1), 30-42.

Gülay Ogelman, H. (2014). Gözlem [in Turkish]. A. Önder (Ed.), *Okul öncesi dönemde çocuklarıtanıma ve değerlendirme teknikleri* [in Turkish]. Ankara: Pegem Publishing.

Güler, H. (2016). *İlkokul 1. sınıfa başlayan öğrencilerin okula başlama yaşına göre okula uyumlarının ve okuma-yazma becerilerinin incelenmesi* [The research on school adjustment and literacy skills of first grade primary school students according to schooling age] (Unpublished master thesis). Giresun University.

Güner, F., & Kartal, H. (2019). A qualitative analysis on schools' readiness. *Trakya Journal of Education*, *9*(2), 244-259.

Hui, A., & Lau, S. (2006). Drama education: A touch of the creative mind and communicative-expressive ability of elementary school children in Hong Kong. *Thinking skills and creativity*, *1*(1), 34-40.

Işıkoğlu Erdoğan, N., & Şimşek, Z. C. (2014). Investigation of school readiness of first grade children, parents and teachers. *International Journal of New Trends in Arts, Sports & Science Education*, *3*(2), 62–70.

Jindal-Snape, D. (2018). "Transitions From Early Years to Primary and Primary to Secondary." In Scottish Education (Fifth Edition), edited by T. G. K. Bryce, W. M. Humes, D. Gillies, and A. Kennedy, 281–291. Edinburgh: Edinburgh University Press.

Jindal-Snape, D., Vettraino, E., Lowson, A., & McDuff, W. (2011) Using creative drama to facilitate primary–secondary transition, Education 3-13: *International Journal of Primary, Elementary and Early Years Education*, *39*(4), 383-394. http://doi.org/10.1080/03004271003727531

Köksal Akyol, A. (2019, October). *Okul yaşamına ve okul süreçlerine uyum* [Oral Presentation]. Uluslararası Eğitimde Yaratıcı Drama Kongresi [30. International Congress on Creative Drama in Education], Çukurova University, Adana, Turkey.

Köse, C. (2023). *Örtük programın öğretmen yetiştirme sürecinde öğretmen kimliğine etkisi* [The impact of hidden curriculum on teacher identity in the pre-service teacher education] (Unpublished doctoral dissertation). Anadolu University.

Kurtuluş Çalışkan, G., & Canbulat, T. (2023). İlkokul 1. sınıf öğrencilerinin okula uyum ve okula hazırbulunuşluklarının değerlendirilmesi [Evaluation of the adaptation and readiness of 1st grade primary school students to school] *Van Yuzuncu Yıl University Journal of Education Faculty*, *20*(1), 254-280. http://doi.org/10.33711/yyuefd.111479

Ladd, G. W. & Price, J. M. (1987). Predicting children's social and school adjustment following. *Child Development, 58*(5), 1168-1189. http://doi.org/10.2307/1130613

Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: related spheres of influence? *Child Development,* 70, 1373–1400.

Lee, P., & Bierman, K. L. (2015). Classroom and teacher support in kindergarten: Associations with the behavioral and academic adjustment of low-income students. *Merrill-Palmer Quarterly, 61*(3), 383-411.

Legkauskas, V., & Magelinskaitė-Legkauskienė, S. (2021) Social competence in the 1st grade predicts school adjustment two years later, *Early Child Development and Care, (191)*1, 83-92. http://doi.org/10.1080/03004430.2019.1603149

Li, W. H. C., Mak, Y. W., Chan, S. S. C., Chu, A. K. Y., Lee, E. Y. M., & Lam, T. H. (2012). Effectiveness of a play-integrated primary one preparatory programme to enhance a smooth transition for children. *Journal of Health Psychology, 18*(1), 10-25. http://doi.org/10.1177/1359105311434052

Lifshin, U., Kleinerman, I. B., Shaver, P. R., & Mikulincer, M. (2019). Teachers' attachment orientations and children's school adjustment: Evidence from a longitudinal study of first graders. *Journal of Social and Personal Relationships, 37*(2), 559-580. http://doi.org/10.1177/0265407519874881

Loukas, A., Ripperger-Suhler, K. G., & Herrera, D. E. (2012). Examining competing models of the associations among peer victimization, adjustment problems, and school connectedness. *Journal of School Psychology, 50*(6), 825-840. http://doi.org/10.1016/j.jsp.2012.07.003

MEB. (2014). *Eğlence hizmetleri: Yaratıcı drama* [in Turkish]. Ankara: Ministry of Education.

MEB. (2018). *Drama dersi öğretim program* [in Turkish]. Ankara: Ministry of Education.

MEB. (2019a). *Okula uyum program* [in Turkish]. Ankara: Ministry of Education.

MEB. (2019b). *Sınıf rehberlik programı (Okul Öncesi, İlkokul, Ortaokul, Ortaöğretim/Lise)* [in Turkish]. Ankara: Ministry of Education.

Miles, M. B., & Huberman, A. M. (2016). *Genişletilmiş bir kaynak kitap: Nitel veri analizi* [in Turkish]. (S. Akbaba Altun & A. Ersoy, Trans. Ed.). Ankara: Pegem Publishing (Original work published 1994).

O'Farrelly, C., Booth, A., Tatlow-Golden, M., & Barker, B. (2020). Reconstructing readiness: Young children's priorities for their early school adjustment. *Early Childhood Research Quarterly, 50*, 3-16. http://doi.org/10.1016/j.ecresq.2018.12.001

Önder, A. (2012). *Okul öncesi çocukları için eğitici drama uygulamaları* [in Turkish]. Ankara: Morpa Kültür Publishing.

Önder, A., & Gülay, H. (2010). Reliability and validity of the Teacher Rating Scale of School Adjustment for 5-6 years of children. *International Online Journal of Educational Sciences, 2*(1), 204-224.

Osher, D., Bear, G. G., Sprague, J. R., & Doyle, W. (2010). How can we improve school discipline? *Educational Researcher, 39*(1), 48–58. http://doi.org/10.3102/0013189X09357618

Özaslan, D. (2019). *Eğitim fakültesi öğrencilerinin örtük program algılarının incelenmesi* [Exploring education faculty students' perceptions towards hidden curriculum] (Unpublished master thesis). Kahramanmaraş Sütçü İmam University.

Özer, A., Ergene, T., Demirtaş Zorbaz, S. Gençtanırım Kurt, D., & Gençoğlu, C. (2022). İlkokul birinci sınıfa geçiş sırasında okula uyum etkinliklerinin katkısı: Ankara ili örneği [The positive contribution of school adjustment activities to the transition of first grade students: A case study in Ankara]. *Education and Science, 47*(210), 27-39. http://doi.org/10.15390/EB.2022.10397

Özgür İnam, B. (2013). *İlkokul 1. sınıf uyum ve hazırlık çalışmaları programının değerlendirilmesi* [Evaluation of the primary school 1st grade adaptation and preparation works program] (Unpublished master thesis). Ankara University.

Roorda, D. L., Zee, M., & Koomen, H. M.Y. (2020). Don't forget student-teacher dependency! A meta-analysis on associations with students' school adjustment and the moderating role of student and teacher characteristics. *Attachment & Human Development, 23*(5), 490-503. http://doi.org/10.1080/14616734.2020.1751987

Ryan, A. M., Shim, S. S., & Makara, K. A. (2013). Changes in academic adjustment and relational self-worth across the transition to middle school. *Journal of Youth and Adolescence,* 42, 1372–1384. http://doi.org/10.1007/s10964-013-9984-7

Schneider, B. H., Manetti, M., Frattini, L., Rania, N., Santo, J. B., Coplan, R. J., & Cwinn, E. (2014). Successful transition to elementary school and the implementation of facilitative practices specified in the Reggio-Emilia philosophy. *School Psychology International, 35*(5), 447-462. http://doi.org/10.1177/0143034313511003

Seppänen, S., Toivanen, T., Makkonen, T., Jääskeläinen, I. P., & Tiippana, K. (2021). The paradox of fiction revisited—Improvised fictional and real-life social rejections evoke associated and relatively similar psychophysiological responses. *Brain Sciences*, *11*(11), 1463.

Şeren, N. (2021). The views of the students who newly started training at the department of primary school teaching at university about orientation program applied with creative drama activities. *International Journal of Social and Educational Sciences*, *3*(5), 239-256.

Tam, P. C. (2016). Children's creative understanding of drama education: A Bakhtinian perspective. *Thinking Skills and Creativity*, *20*, 29-39.

Tam, P. C. (2021). Blurring the play–drama boundary: A case study investigating the teaching and learning of a drama-integrated curriculum in a Hong Kong kindergarten. *Contemporary Issues in Early Childhood*, *22*(4), 328-341.

Taşçı, N., & Dikici Sığırtmaç, A. (2014). Okula uyum haftasının okul öncesi öğretmenleri ve sınıf öğretmenleri açısından incelenmesi [The analyse of school adjustment program based on the experiences of pre school teachers and primary school teachers]. *Milli Eğitim Dergisi*, *44*(202), 101-116.

Temel, N., & Sapsağlam, Ö. (2018). An analysis of the effect of the real-life based values education program on students' school adjustment skills and social competence of the first-grade primary school students. *Journal of Turkish Studies (Elektronic)*, *13*(4), 1015-1034.

Tuğluk, M. N., & Ayhan, M. (2019). *İlkokula hazıroluş ve hazıroluşuna ilişkin faktörler* [in Turkish]. D. Yalman and M. Ü. Öztabak (Ed.), Okula uyum ve erken okuryazarlık eğitimi [in Turkish] (p. 116). İstanbul: Efe Akademi.

Türker, M. & Tunç, E. (2021). İlkokul birinci sınıf öğrencilerinin okula uyum ve sosyal yeterlik düzeylerini etkileyen yordayıcıların incelenmesi [An investigation of the predictors that affect first-grade students school adaptation and social competence levels]. *International Journal of Social and Educational Sciences*, *16*, 104-122.

Urbina-Garcia, A. (2019). Preschool transition in Mexico: exploring teachers' perceptions and practices. Teach. Teach. Educ. 85, 226–234. http://doi.org/10.1016/j.tate.2019.06.012

Urbina-Garcia, A. (2020). An intervention programme to facilitate the preschool transition in Mexico. *Front. Educ. 5*(95). http://doi.org/10.3389/feduc.2020.00095

Usakli, H. (2018). Drama based social emotional learning. *Global Research in Higher Education. 1*(1), 1-16. http://doi.org/10.22158/grhe.v1n1p1

Üstündağ, N. (2014). *İlkokul birinci sınıf uyum ve hazırlık programının öğretmen görüşlerine göre değerlendirilmesi* [Evaluation of the primary school first grade orientation and preparation curriculum according to teachers views] (Unpublished master thesis). Adnan Menderes University.

Wildenger, L., and McIntyre, L. (2011). Family concerns and involvement during kindergarten transition. *J. Child Fam. Stud. 20*, 387–396. http://doi.org/10.1007/s10826-010-9403-6

Yalçın, V. (2017). Teacher's opinions and experiences about the adjustment processes of preschool children to the school. *Journal of Current Researches on Educational Studies*, *7*(2), 1–12. http://doi.org/10.26579/jocures-7.2.1

Yıldırım, A., & Şimşek, H. (2016). *Sosyal bilimlerde nitel araştırma yöntemleri* [in Turkish]. Ankara: Seçkin Publishing.

Yoo, Y. G., & Lee, I. S. (2013). The effects of school based Maum meditation program on the self-esteem and school adjustment in primary school students. *Global Journal of Health Science*, *5*(4), 14-27. http://doi.org/10.5539/gjhs.v5n4p14

Zupancic, M., & Kavcic, T. (2011). Factors of social adjustment to school: Child's personality, family and pre-school. *Early Child Development and Care*, *181*(4), 493-504.

## About the authors:

**Nazife TOSUN**
Nazife TOSUN, who completed her undergraduate education in the Department of Preschool Teaching, works as a Preschool Teacher in a village school in Isparta. She is also a PhD student in Curriculum and Instruction at Burdur Mehmet Akif Ersoy University. Adopting a student-centered teaching approach, she works on creative drama in education, teaching through games, educational sciences, teacher training, especially orientation in primary school, teaching, and teacher enthusiasm.

**Kenan DEMİR**
Kenan DEMİR works as an Associate Professor in the field of Curriculum and Instruction at Burdur Mehmet Akif Ersoy University. He especially works on instructional design, teaching through games

and gamification, and ipsative evaluation within the scope of integrated curriculum applications. He is a former classroom teacher and holds a bachelor's degree in measurement and evaluation and a master's degree in the same field. It supports learning in accordance with the nature and mentality of the individual and in this sense, examines the concept of "Green Education" and carries out studies on the enthusiasm of teaching and learning in this direction.

IOJPE

IOJPE

ISSN: 1300 – 915X
www.iojpe.org

*International Online Journal of Primary Education* *2024, volume 13, issue 1*

# A CRITICAL INCIDENT ANALYSIS OF PARENT-SCHOOL ADMINISTRATORS' CONFLICTS IN PRIMARY SCHOOLS

Metin ÖZSOY
YTU Faculty of Education, İstanbul, Türkiye
ORCID: https://orcid.org/0000-0003-3548-4386
metinozsoy05@gmail.com

Erkan TABANCALI
Assoc.Prof.Dr., YTU Faculty of Education, İstanbul, Türkiye
ORCID: https://orcid.org/0000-0001-7536-2696
tabanca@yildiz.edu.tr

**Received:** March 16, 2023 **Accepted:** March 10, 2024 **Published:** March 31, 2024

**Suggested Citation:**
Özsoy, M., & Tabancalı, E. (2024). Parents-school administrators conflicts in primary schools: A critical incident analysis. *International Online Journal of Primary Education (IOJPE), 13*(1), 78-92. https://doi.org/10.55020/iojpe.1266450

This is an open access article under the CC BY 4.0 license.

**Abstract**

Examining the disputes that arise between parents, teachers, and students is the goal of this study. The study, which was carried out at the primary school level, where parent-child interaction is high, employed the critical incident analysis method. The typical sampling method was used to select participants for the study, and school principals were required to have at least 5 years of managerial experience. As a part of this research, interviews were conducted with 10 elementary school principals working in the Tuzla district of Istanbul. A semi-structured form, prepared by the researchers in consultation with experts, was used as a data collection tool. As a result of the interviews, themes were identified relating to "reasons of conflict," "conflict resolution methods," "end of conflict," and "impact and change of conflict." Effective communication, active listening, valuing others, seeking support, and displaying a firm stance were identified as conflict resolution methods. The conflicts affected school principals emotionally and influenced them to behave more professionally. The study's conclusions include that school principals should receive training in communication skills, have their legal standing reinforced, and become more professional. Given the critical importance of managing conflicts in educational settings, recommendations for researchers are offered.

**Keywords:** Critical incident analysis, conflicts, professionalization, effective communication.

## INTRODUCTION

“School is our second home.” This expression implies that parents can enter the school with wide open arms. The relationship between parents and schools has been a topic that has long attracted the attention of educational researchers (Bilton et al., 2018; Guo & Mohan, 2008; Saltmarsh & McPherson, 2022). Effective school approaches that value parental involvement in school attendance argue that increasing the level of parental involvement has positive effects on students' education (Sanders & Epstein, 1998). Increasing teacher-parent interaction accelerates student adaptation (Kim et al., 2013) and supports academic success (Kainz & Aikens, 2007). Additionally, it is said that parents are expressing a wish to be more active in their kids' education on a regular basis. (Peters et al., 2008).However, the involvement of students’ parents in the school ecosystem can generate conflicts in practice (Saltmarsh & McPherson, 2022). Cultural differences, time constraints (Lasky, 2000), and socioeconomic status (Thijs & Eilbracht, 2012) can be cited as some of the reasons for these conflicts. One of the main causes of these disputes is communication issues brought on by differences in parenting viewpoints and educational approaches, which is why it's critical to enhance communication channels (Guo & Mohan, 2008). Furthermore, it's necessary to acknowledge the expectations of the parents of the pupils, ascertain the difficulties they encounter, and devise workable solutions (Rhijn et al., 2018).

Research on conflicts in schools has often been based on teacher-administrator relationships (Aydin et al., 2011; Kimber & Campbell, 2014; Zembat, 2012), teacher-student relationships (Carbonneau, 2020; Ciuladiene & Kairiene, 2018; Xie & Jiang, 2021), and teacher-parent relationships (Addi-Raccah &

Grinshtain, 2021; Amado et al., 2012; Gwernan-Jones et al., 2015; Ruiz et al., 2015). However, when conflicts in schools are not resolved, the school principal may become a part of the conflict, directly or indirectly. Nevertheless, there are limited studies about the role of school principals in the conflicts of students' parents (Lareau & Munoz, 2012; Saltmarsh & McPherson, 2022).

This study aims to understand the reasons behind conflicts between parents in primary schools. Primary schools are seen as the level of education where parental involvement is intense and school administrators organize this involvement most effectively (Albez, 2016), and to analyze conflict resolution strategies employed by school principals. The critical incident analysis method was applied in this study to examine previous instances involving the interaction of parents and school principals. The question of what conduct school principals would display in the same situation was then used to analyze the behavioral changes that had happened.

**Conflict**

Conflict can arise in every situation where people interact.. Conflict is generally perceived as a frightening concept, as human memory associates it with negative experiences such as bitterness, enmity, and wars (Karip, 2013). However, interpersonal conflicts are inherently neither positive nor negative. Conflicts have a neutral value. Whether they acquire a positive or negative quality depends on how they are managed and resolved (Türnüklü et al., 2002). If the management of a conflict is destructive or competitive, the outcomes are negative, whereas if it creates development opportunities, the results can be positive (Crawford & Bodine, 1996).

There are several approaches that can be used to handle conflicts. Five conflict resolution tactics are listed by Rahim (2001): integrating, complying, dominating, avoiding, and compromise. By thoroughly exploring the core causes of the dispute, integrating seeks to eliminate them. It is a strategy that can result in a permanent resolution of the conflict. Obliging refers to one party in the conflict giving up their interests due to the other party's more significant concerns. The dominating strategy generally leads to the imposition of the dominant party's demands. Avoiding is a method that can be temporarily used in cases where the reasons for the conflict are insignificant or when the conflict is escalating. Compromising is a strategy employed to reach an agreement by giving up some of the demands mutually (Rahim, 2001).

Conflicts arise for many reasons, such as communication problems, lack of information (Podolchak et al., 2016), workload, high expectations from managers (Yılmaz & Öztürk, 2012), managerial uncertainties, and power struggles (Koçel, 2015), among others. The conflict that emerges may result in negative consequences such as decreased organizational commitment, loss of motivation, weakening of friendships, decreased productivity, and increased stress (Çalık, 2021), as well as positive outcomes such as the acquisition of psychological maturity, increased self-esteem, achieving better solutions, eliminating monotony, and enabling the organization to keep up with the requirements of the era (Karip, 2013).

Not only can conflicts arise between administrators in educational institutions, but they can also arise between teachers and teachers, teachers and staff, staff and staff, students and students, students and parents, parents and parents, teachers and students, and teachers and parents. educational institutions(Köseoğlu & Aydın, 2022; Özge Sağbaş & Özkan, 2022; Sarıpınar, 2014; Türnüklü et al., 2002). Considering that educational institutions are structures that contain the human factor at their core and that conflict is inevitable, knowledge of the concept of conflict and how to manage it by educational administrators will be beneficial for schools, which are educational institutions (Şimşek et al., 2003).

**Conflicts in Educational Organizations**

Conflicts in schools can arise from a variety of factors, including structural reasons, individual differences (Nikolaou, 2018), unclear job descriptions, perceptual differences (Salleh & Adulpakdee, 2012), material issues (Karip, 2013), personal reasons in relationships, and organizational reasons (Saiti, 2015). Principals of schools are reported to have the biggest disagreements with teachers(Karip, 2013), and teachers have the most conflicts with students (Andreea-Mihaela, 2014). Conflict resolution

strategies that are frequently used by school principals can be listed as integrating (Karip, 2013; Saiti, 2015; Salleh & Adulpakdee, 2012), compromising (Girgin, 2020; Karip, 2013), and conceding (Girgin, 2020). Conversely, other research indicates that when the experience grows or is not regularly employed as a dispute resolution tactic, compromise is not favored. (Şahin, 2016; Vestal, 2011). Only disputes with parents—the largest stakeholders in education—have been the subject of studies.. Educational leaders will benefit from a review of parent-school conflicts, an investigation of the reasons behind them, and a study of the efficacy of conflict resolution techniques.. The successful management of parents' involvement in a school ecosystem will have a positive impact on an educational system.

The purpose of this study is to examine the conflict stories between parents of primary school students and school administrators in Türkiye. For this purpose, first, the school administrator was asked about having a conflicting story. The following questions were asked to school administrators who had a conflicting story:

How did the parents' and the school administrator's disagreement begin, grow, and ultimately be resolved?How would the conflict resolution process differ if a comparable incident occurred today,?

## METHOD

### Design of the Study

In this study, the critical incident technique from a qualitative research approach has been used. Rich data can be collected using this technique for situations where humans are active agents, especially in the social sciences.. The strength of the critical incident technique is that it allows for the extraction of rich data from real-life events and the revelation of shared realities. It is sufficient that the event analyzed is a specific event experienced by an individual and reveals any aspect of the topic (Butterfield et al., 2005; Hughes et al., 2007; Trepal & Hammer, 2014). The critical incident technique is useful when hypotheses are unclear, and the responses determine the trends. Adequate and systematic responses are sufficient for accuracy and reliability (Butterfield et al., 2005). The critical incident analysis technique involves five stages: determining goals, devising plans, collecting data, analyzing data, and interpreting data (Hughes et al., 2007). The present investigation has undertaken an analysis grounded in the experiences of school administrators employed in primary schools, where parent-teacher interaction is more intense (Albez, 2016). Conflict stories were analyzed using the critical incident analysis method.

### Participants

Typical case sampling is a purposive sampling technique that was used to choose study participants. A technique that can represent the universe and has features that don't deviate greatly from the population is typical case sampling. (Marshall & Rossman, 2014). Typical cases can be identified using data from surveys and demographic analyses (Bernard, 2011). Tuzla district ranks 12th in terms of socio-economic development among the districts of Istanbul (SEGE, 2022). Considering that it has parent profiles with different statuses, it was evaluated as a typical sample for Istanbul as a whole. There are 23 primary schools in Tuzla district, and 10 school principals who work in these schools were interviewed voluntarily. The participants were asked questions about their professional seniority, managerial experience, and educational background. The data obtained from the participants is presented in Table 1.

**Table 1.** Participants of the study.

| Code | Position | Gender | Professional Experience (Teaching + Management) (Year) | Duration of Manager (Year) | Education Level |
|---|---|---|---|---|---|
| Shark | School Manager | Male | 22 | 10 | Bachelor's D. |
| Fox | School Manager | Male | 13 | 10 | Master's D. |
| Turtle | School Manager | Female | 27 | 9 | Master's D. |
| Teddy Bear | School Manager | Male | 17 | 10 | Master's D. |

**Table 1** (Continued). Participants of the study.

| Code | Position | Gender | Professional Experience (Teaching + Management) (Year) | Duration of Manager (Year) | Education Level |
|---|---|---|---|---|---|
| Owl | School Manager | Female | 25 | 12 | Bachelor's D. |
| Sword | School Manager | Male | 22 | 11 | Bachelor's D. |
| Brain | School Manager | Male | 24 | 18 | Master's D. |
| Shield | School Manager | Female | 16 | 8 | Bachelor's D. |
| Spear | School Manager | Male | 27 | 25 | Bachelor's D. |
| Chess | School Manager | Male | 18 | 6 | Master's D. |

The research participants, who are school principals, are 7 males and 3 females. It was observed that the participants had professional seniority ranging from 13 to 27 years and managerial experience ranging from 6 to 25 years. Among the participants, five had completed their undergraduate studies, while the rest had completed their graduate studies.

**Data Collection**

In order to get more information about the initiation, progression, resolution, and effects of conflicts involving researchers, school administrators, and student parents, researchers have created a semi-structured form with two interview questions.. To validate the effectiveness of the developed form, input was sought from two different experts in the field of educational management, who provided feedback indicating that the form could be adequate and suggested conducting a sample application. A pilot study was conducted, and the transcripts of the obtained responses were shared with the same experts. The results demonstrated that the semi-structured form was consistent, comprehensible, and adequate for the research objectives. By providing a specific framework for interviews, semi-structured forms ensured that the researcher remained within the anticipated parameters (Robson & McCartan, 2016). Prior to the interviews, participants were briefed about the research, and they were informed of their right to withdraw at any time. Permission was obtained for recording the interviews, and participants were asked to complete informed consent forms. The interviews were conducted face-to-face, with each session lasting approximately 20-25 minutes. The data collection process of the study was carried out with the approval number 2022.12 obtained from the Yıldız Technical University Ethics Committee.

**Data Analysis**

The data were subjected to content analysis, which involves the systematic disaggregation of details pertaining to participants' opinions (Merriam & Grenier, 2019). The audio recordings of the interviews were transcribed into written text using a computer, resulting in a total of 43 pages of content. The researcher carefully examined the raw data twice, and descriptive codes were generated using terms that encapsulated the primary notion, in accordance with Saldana's (2013) recommendations.. As acknowledged in qualitative research methodologies (Creswell, 2013), the researcher is situated at the core of data analysis, employing inquiries, observations, researcher journals, and commentaries as integral tools for data collection. The fact that the researcher was at the focal point of the analysis process and had personal observations ensured that the data analysis was carried out manually in order not to miss the fine details in the interviews. Categories and themes were then derived from the similarities among the assigned codes. An expert in qualitative studies in the field of education was consulted for their opinions, and based on their feedback, the theme of conflict reasons was subdivided into two sub-themes: initiators and maintainers.

## RESULTS

The conflicts between parents and school administrators in primary schools were analyzed through the analysis of an event that the participants, who had five or more years of managerial experience and still served as school principals, had experienced in the past and considered important. Based on the narratives of the participating school principals, the themes of "reasons of conflict," "conflict resolution

methods," "ending of conflict," and "impact and change of conflict" were formed. The findings, along with sub-themes and categories, are presented in Figure 1.

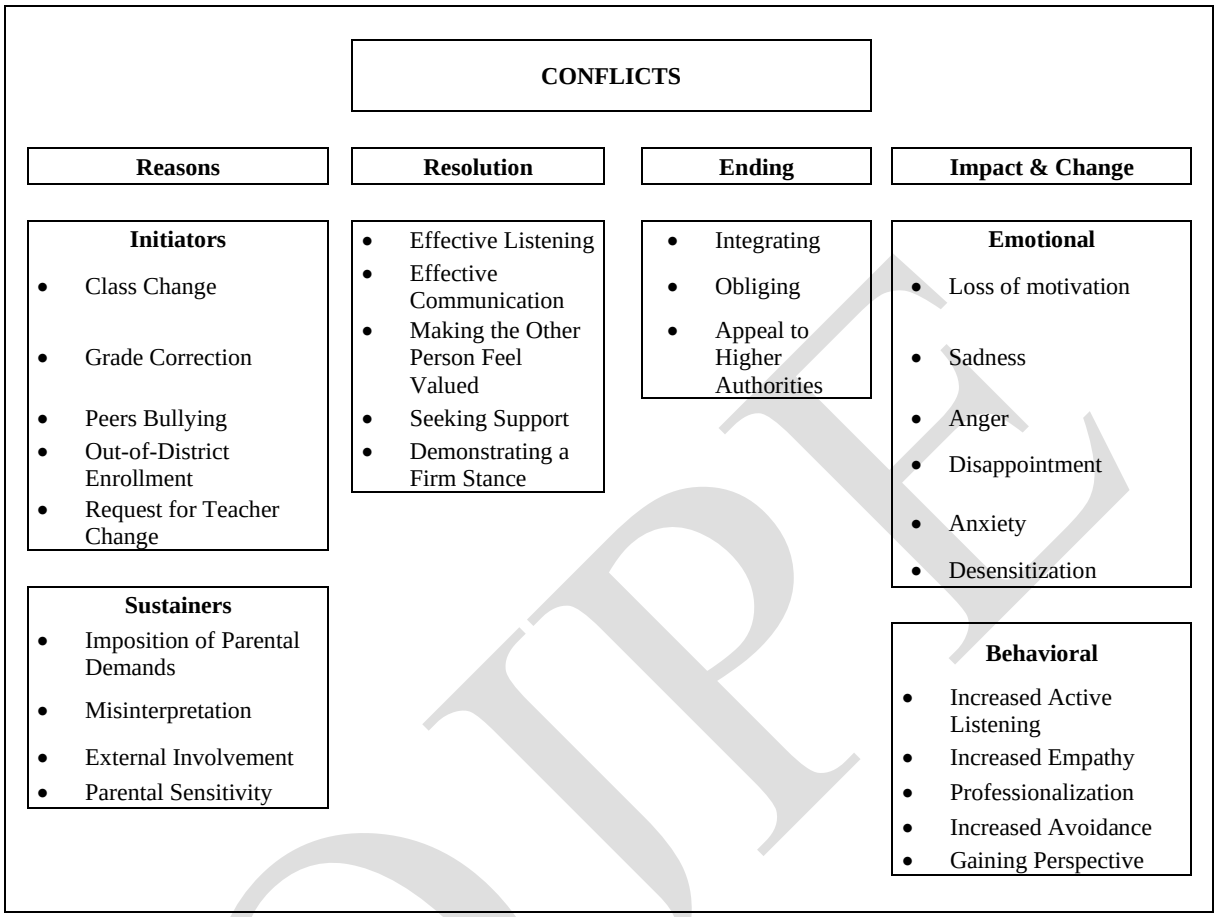


**Figure 1.** Conflicts between parents and school administrators.

**Theme 1: Reasons of Conflict**

Based on the narratives of school principals, two sub-themes and a total of eight categories were identified regarding the initiating and sustaining factors of conflicts between parents and school administrators in primary schools. Initiating factors were identified as class change, requests for grade correction, peer bullying, out-of-district enrollment, and requests for teacher selection. Sustaining factors were identified as the imposition of parents' demands, misinterpretation, external involvement in the matter, and parental sensitivity. Among the initiating factors, class change was the most frequently mentioned by the participants. Regarding their experience, the participant, known as Shark, stated the following:

> *"The issue is about a classroom change, which is actually a simple matter. The student was still in the 1st grade. The parent requested a classroom change for the student. It was an early period, maybe only 1 or 2 weeks since school had started. The parent was complaining about the teacher. The teacher in question, in our opinion, is a successful and good teacher. The child was a little younger than his or her peers. When the teacher talked to the parent about this issue, the parent thought that the teacher did not want the student."*

Fox is a different school principal who has voiced disagreements over class changes. Here, the parent's request is really motivated by their desire to transfer their student to a different teacher..

> *"I will tell you about a conflict I experienced about a class change. When the student started school, the parent saw that the teacher did not fit the profile they had in mind for their child. So, they came to me with a request. We told them that we could not fulfill that request. Then they made a complaint*

*against us. Parents hear things about teachers from others and think it would be better for their child to have a specific teacher. But this particular parent realized that their child was doing very well with the current teacher, and even if we suggested a change, they wouldn't want it."*

Turtle, sharing an experience where peer bullying was the initiating factor for a classroom change;

*"I often receive requests for class changes. They are not happy with the teacher, and they are not happy with their classmates. I will tell you about one of these cases. The parent wanted their child to change classes. I said I would look into it in detail. We talked to the class teacher and the guidance counselor. The student was bullying their classmates in the class, so they were having problems. After discussions with our guidance counselor, we determined that the student had entered early adolescence and was showing behavioral problems as a result. Then we made referrals to psychiatry, etc."*

Bullying among peers can cause problems for students in school and can lead to conflicts that affect parents as well. Misunderstandings and parental sensitivities can complicate solutions. As Teddy Bear reported;

*"During lunch break, my student got a rope tangled around his neck while playing. More precisely, the rope left a mark after hitting him. Later, when the teacher handed over the student at the end of the school day, the mother noticed the mark on the child's neck and asked what happened. The teacher replied that the student did not mention anything important to her. When they got home, the parents learned the truth from what the student told them and immediately came to the school. They were angry and asked questions such as, 'Why didn't anyone care? Isn't there any security here? How did you not notice?' They thought their child was choked with a rope by his friends. When I reviewed the videos, I saw that while playing jump rope in the yard, the rope hit his neck and left a mark. I showed it to the parents."*

As for the initiating reasons, the request for grade correction, and the sustaining reasons, the involvement from outside the issue, Owl has this to say:

*"The teacher gave the student a low grade. The parent came to me with anger towards the teacher. Then, I talked to the teacher. The teacher was concerned about the issue, but the conflict did not end. Later, when the incident continued, the teacher took a cool attitude, said that she would not do anything, and withdrew. The parent turned completely towards me because she was obliged to maintain a relationship with the teacher. She started complaining to me about unrelated issues in different departments."*

Sword presented another example of external involvement in the matter. The category of sustaining reasons, where the parent imposes their demands, is again prominent here.

*"The issue started with the teacher and eventually came to me. The teacher was not responding to the parents' text messages. The parent was asking about assignments and important topics for their child. Then, I wanted to understand the situation by talking to the teacher. However, the teacher stated that they were not obligated to do so and that they had received constant messages. As a result, we also had a problem with our teacher. The parents tried to justify themselves by telling us about how other schools and teachers maintain excellent communication. In short, they said that we, as administrators, could not manage this situation."*

Based on the narratives, it can be observed that conflicts between parents and school administrators generally start with a request from the parents, such as a request for a class change, a specific teacher, out-of-district enrollment, a low grade, or peer bullying experienced by the student. As reasons for sustaining the conflict, misunderstandings, a dominant attitude in parents' demands, the sensitivity created by being a parent, and the sudden involvement of the school administrator in the matter have been identified. The beginning of the incidents and the following process can directly affect the behavior adopted by the school administrator.

**Theme 2: Conflict Resolution Methods of the School Principal**

Based on the narratives, five categories of conflict resolution methods used by the school principal in parent-school conflicts in primary schools were identified as active listening, effective communication,

making parents feel valued, seeking support, and demonstrating a firm stance. Regarding the incident that Brain experienced, the following has been presented;

> *"A parent came to me claiming that their child had been harassed. The uncle of the child also came with a gun in his hand. As you know, these are critical situations. I immediately called my guidance counselors. I asked them to have discussions about the matter and provide information. It turned out that one child reached into another child's pocket to take some money, which caused this misinterpretation."*

Here, it can be observed that the relevant school principal requested support from the guidance counselor, who is an expert on the subject. After the counselor's consultation, it was determined that the incident was more accurately described as peer bullying among 1st grade students. Similarly, in the case of Fox and Tortoise, they expressed their intention to act in accordance with the guidance of the counselor regarding their class change problems and received expert support as a conflict resolution method. In order to make parents feel valued, Teddy Bear and Spear shared a common expression unique to Turkish culture. Spear indicated;

> *"We usually focus on the solution; try to understand while doing it over a cup of tea."*

Bear is similarly said;

> *"I made him/her understand that I sensed his/her anger. Then I offered a cup of tea before our conversation."*

During the conflicts that arose, school principals were observed to exhibit a resolute stance and act towards the implementation of their own ideas. Despite the crisis growing in intensity, Shark refrained from implementing an alternative solution as he was certain of the correctness of the teacher selection.

> *"We are confident in the competence of our teacher. I explained to the parent that their request would have negative consequences and that we have the best interests of our student in mind. The parent even threatened to harm me physically if I did not make the change. However, I persisted in explaining and did not make the alteration. In the end, the student successfully graduated from the class."*

In a conflict that arose due to out-of-district enrollment, the school principal, Shield, demonstrated a determined stance and attempted to manage the conflict in accordance with the required regulations.

> *"The parent came to the school to register their child, who was going to start first grade in August, when this incident occurred. When I checked the system through identity verification, I realized that the student was not on our list. When I explained the situation, the parent expressed that everyone was making non-residential registrations, discrimination was taking place, and that I had to register their child. I explained the regulations again and told them that they had to go to the school close to their home. I also informed them about exceptional circumstances. As a result, the parent made a complaint against me to CIMER (Presidential Communication Center)."*

Effective communication frequently appears among the statements. Chess;

> *"In first grade, we determine our students' classes by drawing lots. However, every year, some parents come to our office to discuss their preferences for teacher selection. First, we listen to their reasons and explanations. Then, we explain our procedures, the reasons behind them, and the criteria we consider preventing certain situations. Through mutual communication, we usually resolve the issue. "*

The strategy followed by school principals to resolve conflicts involves primarily effective listening to the opposing party, maintaining effective communication by presenting their explanations, seeking expert support from guidance counselors and class teachers, ensuring that the parent feels understood, reducing emotional intensity, and exhibiting a determined stance to make correct decisions that serve the best interests of the student.

**Theme 3: Ending of Conflict**

Based on the narratives of participating school principals, three categories have been identified regarding how conflicts between parents and school administrators in primary schools are resolved: integrating, obliging, and appealing to higher authorities. Although the integrating approach has been attempted by most participating school principals, the success rate has remained low and often resulted in appeals to higher authorities. For example, as expressed by the school principal, Shark,

> *"A parent requested a classroom change for their student. It was still early in the school year, perhaps only 1 or 2 weeks since the start. They were unhappy with the teacher. I listened to them in detail and told them that we had the best interest of the student in mind. They even threatened me with physical violence. But I kept explaining, and explaining... Eventually, we ended up in court."*

As for the outcome of the incident, school principal Owl stated that:

> *"The incident started with the teacher and then turned to me. They started complaining about me to CIMER every week, saying that I was causing discrimination in many areas."*

Fox, a different school principal, also received complaints regarding his inability to exert authority and dominance..

> *"A parent requested a classroom change, but we did not accept it. Later, we received several complaints from CIMER. Many different things were written, and the request for classroom change was squeezed in between them."*

If we look at situations where conflicts were completely resolved, the account of school principal Turtle can serve as a suitable example for integrating.

> *"I expressed that I would examine the request for a class change for the student. We had meetings with the class teacher and guidance counselors. After the guidance counselor's discussions, we determined that the student entered early adolescence and showed behavioral problems as a result. Then a psychiatric referral was made. The class was changed. The student started medication, and the problem was completely resolved."*

A similar example can be given from the account of the school principal, Chess.

> *"The parent of a student expressed a desire to choose a specific teacher during the registration period for the first grade. They had learned the name of a teacher and wanted their child to be assigned to them. I explained to them about our policy of using a lottery system for teacher assignments and emphasized the importance of fairness and treating everyone equally. However, the parent became angry and threatened to file a complaint if we did not comply with their request. After an investigation and assuring them of our commitment to fairness, they expressed their concerns to us, and we were able to resolve the issue."*

There are narratives that describe the obliging behaviors of student parents. In the experience of school principal Spear, a parent showed obliging behavior and acted according to the guidance provided.

> *"We had a successful student at the time when I worked at a school located in a disadvantaged area. A scholarship opportunity came up, and we wanted this student to benefit from it. The father was working for the minimum wage. When we called him, he did not accept it and responded with anger. We tried to persuade him and asked him to spend the money on his child's education. The student benefited from the scholarship and became the first in Türkiye in the exam he took later in life."*

Another experience involving integrating and ending with obliging behavior from a parent was experienced by the school principal, Sword.

> *"The teacher did not respond to the parents' phone messages. The parent wanted to ask about homework, and there were important topics for their child... Trying to justify themselves, the parent mentioned that teachers at other schools maintain very good communication. I explained that we cannot communicate with teachers outside of school hours without the teacher present, and if there is something very important, we should request a meeting and act according to the teacher's availability. I also said that parents can communicate with each other regarding issues like*

*homework. They were not pleased, but I didn't hear anything further from the teacher or parent regarding this issue."*

The overall finding is that parents expect their demands to be resolved as they wish. School principals also anticipate that by establishing lines of communication, parents will embrace the practices that they view as appropriate.In this direction, six of the ten distinct tales that were evaluated resulted in a complaint being filed with higher authorities. In the other stories, it was found that the parent behaved obligingly even though they did not quite embrace it or that the issue was cooperatively settled.

**Theme 4: Impact and Change**

The conflicts between parents and school administrators in primary schools have been divided into two sub-themes in terms of emotional and behavioral effects and changes. Loss of motivation, sadness, anger, disappointment, anxiety, and insensitivity were among the categories identified in the emotional impact and change sub-theme. Similarly, the behavioral impact and change sub-theme included categories like professionalization, enhanced empathy, increased effective listening, preference for avoidance behavior, and gaining new perspectives. Some school administrators stated that they would approach the same situation in the same way and did not experience any effect or change.

The conflicts that arise in primary schools can evoke a multitude of emotions. In the case of school principal Teddy Bear, who experienced parent conflict after his student developed rope marks on his neck, he reported feeling sad for the student, anger towards the parent's behavior, and a loss of motivation as a result of the incident. In terms of behavioral impact and change, he recognized the need to behave more professionally.

*"When I first heard about the incident, I expressed my sympathy by stating that I was also a parent and could understand their situation. However, the parent called me back that evening, threatening to sue me. The next morning, they came back, and when I showed them the video footage, they calmed down. Despite this, they continued to make other accusations, and I became very angry. This incident had a significant impact on my mood, and if it were to happen again, I would not spend so many hours dealing with it. I could have reached similar results in a shorter amount of time."*

The experience of being threatened with a weapon by parents in two of the incidents described was considered quite normal, causing a sense of anxiety for the school principal. It takes significant experience to be able to handle and manage such a crucial occurrence. The school principal, Brain, expressed the emotional impact of the experience as follows:

*"The mother came to my room, saying that her child was sexually assaulted. The father and uncle came in while I was talking to the child, and the uncle put his gun on the table... When the assault was first mentioned, I became very anxious. It is already sad and concerning that one of our students could experience such a thing. And when people come to you with information that they heard from others, they can come to harm you, physically or otherwise, directly."*

These experiences can lower the motivation and enthusiasm of school administrators and have a negative impact on their work. They might thus grow more callous and engage in avoidance behaviors more regularly. The school principal, Owl, stated:

*"Can you imagine that in this situation I got involved because of my teacher, but my teacher left me alone? Relationships of interest are important. The parent approached me because they had expectations from the teacher... Now, I do not show my side openly. I approach more cautiously without revealing my emotions. If incidents are told to me, I prefer to remain in the listening dimension."*

Avoidance behavior that has been developed as a result of encountering such circumstances can also be demonstrated by referring to formal protocols or by addressing the matter with other educators within the organization. School principal Fox explains this situation with the following statement:

*"When they inquire about a class change, I direct them by stating that the guidance counselor needs to provide their opinion."*

Similarly, Shield stated:

> *"I explain the official procedure and exceptional cases in detail without adding any interpretation. If someone makes a complaint, my response will also adhere to the official procedure. This way, I am preventing any different effects that such problems may have on me."*

The accuracy of the reaction to be delivered depends on one's understanding of the emotional intensity of the new parents. Spear stated that he learned to behave more professionally, improve his active listening skills, and establish better empathy through his experience.

> *"I experienced this incident in 2002, and I still remember it. Back then, the guidance service was not as effective as it is now. We were trying to deal with it. If it had happened now, we would have taken a more conscious approach with the guidance counselor towards the parent. I would have listened better to why the parent was angry. It was an experience that made me realize the importance of empathy."*

The school principal, Turtle, after experiencing an incident that resulted in an unexpected outcome, stated that he gained an understanding of the importance of approaching situations from a different perspective.

> *"After our guidance counselor's meetings, we determined that the student entered early puberty and showed behavioral problems as a result. Then, a referral was made to psychiatry. What we thought was a normal request for a class change led to a very different outcome. The child is bullying peers, but why? What are they experiencing? Look at it from another dimension! That is what I gained from it."*

The conflicts with parents that school principals encounter will have an impact on their management styles in the future. This impact can lead to various outcomes, ranging from personal development to undesirable consequences such as loss of motivation and insensitivity for educators.

When the research's findings were generally evaluated, it became clear that while certain factors contributed to the conflict's beginning, others had long-lasting consequences.. The methods employed by school principals to resolve the conflicts were decided to be active listening, effective communication, making the parent feel valued, seeking support from other professionals, and displaying a resolute stance regarding the methods deemed correct. The conflicts ended in three ways: integration, the parent's obligingness to the decision of the school principal, or the transmission of appeals to higher authorities. Conflicts have an impact on a person's emotions and conduct, changing school principals.. These effects and changes can be either positive or negative.

## DISCUSSION, CONCLUSION, and SUGGESTIONS

The aim of this study was to analyze conflicts between school administrators and parents through critical incidents. The study was conducted at the primary school level, where interactions between parents and school administrators are more frequent. The focus on the primary school level yielded specific results regarding the causes of conflicts. The initiators of conflicts were identified as changes in class placement, requests for grade adjustments, peer bullying, enrollment outside of the school district, and requests for specific teachers. The causes of conflicts related to enrollment outside of the school district, requests for grade adjustments, and requests for specific teachers can be viewed as corresponding to class conflicts within society. Marx and Engels, in their publication of The Communist Manifesto, connected the main reasons for conflicts in society to this class conflict (Freyer, 2012). Individuals from lower socioeconomic backgrounds attempt to enroll their children in schools located in more affluent areas by enrolling them outside of the school district. Students need to achieve excellent scores because of Türkiye's exam-based educational system.. Students with lower grades are more likely to remain in the lower class of society in the future. This is why there is pressure to achieve high grades in schools, starting at the primary school level. In a similar vein, teacher selection can also be explained. Parents want to enroll their children in the classrooms of well-regarded teachers since they are well-known in the community. Thus, Marx's concept of class is indirectly reflected within schools. This situation also

overlaps with Weber's understanding of interest groups in his three-dimensional stratification model (Collins, 2015).

The initiating factors of class changes and peer bullying, along with sustaining reasons such as parental insistence, misperception, involvement of outsiders, and parental sensitivity, can be listed as reasons related to social interaction, where emotions are at the center. Peer bullying is a common and serious problem in Turkish schools (Karaman Kepenekçi, & Çınkır, 2006). Experiencing peer bullying and students' problems with their friends brings about requests for class changes and causes parents to adopt an assertive attitude in this regard. Parental internalization of their children's experiences combined with oversensitivity might result in misconceptions..

School administrators employ different methods to solve conflict situations they face, either directly or indirectly. Active listening, effective communication, showing appreciation, seeking support from colleagues, and demonstrating a resolute stance are prominent conflict resolution methods. Regarding communication, the competence of school administrators and meeting parents' communication expectations are crucial for conflict resolution (Saltmarsh & McPherson, 2022). School principals often emphasize the importance of proper communication in meetings. Some conflicts, however, fall within the expertise of teachers and school counselors, so their support is necessary. Aljhani et al. (2011) found that school principals consult with teachers on topics in which they lack experience. In cases where legal regulations support them and the decision is in the student's best interest, school principals try to resolve conflicts by demonstrating a resolute stance. According to the study by Çakmak (2013), school principals persist in their decisions after providing detailed explanations to parents, and they use this as a conflict resolution method.

According to research findings, conflicts are resolved either by solving the problem or by the parent obliging with the school principal's decision. When expectations are not fulfilled, complaints are made to higher authorities. Studies have shown that school principals frequently use integrating (Saiti, 2015; Salleh & Adulpakdee, 2012), one of the conflict resolution strategies described by Rahim (2001). It has been stated that understanding individuals' problems and presenting detailed solutions through effective communication during interviews eliminate conflicts. It has been observed that some conflicts are resolved by the parent complying with the decision made by school principal's firm stance. It might be argued that in these situations, accurate knowledge and effective communication are equally crucial.. Conflicts that cannot be resolved in a school environment are continued through complaints by parents to higher authorities. School principals state that they receive complaints from higher authorities and communicate the same information they explained to the parent, and conflicts are thus resolved in this manner. This result shows that school principals make decisions in accordance with legal regulations in the incidents recounted.

Conflicts have emotional and behavioral effects on school principals. The study's key participants believe that their work in education is vital, but they also feel demotivated, unhappy, angry, disappointed, and anxious when they hear unfavorable feedback and complaints from parents. This situation can create a negative judgment about the professionalism of the principals. The behavioral impact and change dimensions of the study also support this statement. Professionalization and gaining different perspectives are judgments that school principals have accepted emotionally. Increasing effective listening and empathy skills also indicates professionalization. It is also observed that conflicts particularly result in disappointment, insensitivity, and avoidance behaviors.

The motivations, strategies, and outcomes of disputes between parents and school administrators are all covered in detail in this study. Effective conflict management will have a positive impact on school administrators' ability to carry out their duties, and the success of management activities will also bring educational gains.

**Limitations of the research**

The fact that this study only included ten school principals in its sample size is a notable limitation.. In addition, the exclusivity of participation for principals operating in a single residential area is another

limitation. The generalizability of the findings of the study is limited, primarily because they reflect cultural nuances specific to the Tuzla district of Istanbul.

**Suggestions**

Some recommendations can be made based on the research results. Firstly, by empowering school administrators and addressing legislative gaps, many of the initiating causes of conflict can be prevented. Providing effective communication training to school principals can help reduce communication problems. The professionalization of school administration can also reduce emotional reactions. The research was conducted with primary school administrators, and a similar study can be conducted at different levels. Moreover, conducting studies with the participation of student parents and focusing on teacher-parent conflicts could offer valuable perspectives."

**Ethics and Conflict of Interest**

This study was presented as an oral presentation at the X$^{th}$ International Eurasian Educational Research Congress. Permission number 2022.12 (December 28, 2022) was obtained from the Yıldız Technical University Ethics Committee for the study. The researchers followed the research ethics guidelines. There is no potential conflict of interest between the authors.

**Author Contributions**

Metin Özsoy: Conceptualization, methodology, conducting the interviews, data curation, preparing the original draft. Erkan Tabancalı: Conceptualization, methodology, analysis, data curation, review and editing, preparing the original draft.

**Corresponding Author**

Correspondence to Metin ÖZSOY, metinozsoy05@gmail.com

## REFERENCES

Addi-Raccah, A., & Grinshtain, Y. (2021). Teachers' professionalism and relations with parents: teachers' and parents' views. *Research Papers in Education,* 1-23. https://doi.org/10.1080/02671522.2021.1931949

Albez, C. (2016). *Okul yöneticilerinin veli katılım çalışmalarını örgütleme becerilerinin incelenmesi* [Examining school administrators' organizing skills for parent involvement activities] (Unpublished doctoral dissertation). Atatürk University.

Aljhani, Y. M. S., Hassan, J., & Amzat, I. H. (2011). Strategic conflict management of secondary school administrators in the Tabuk region, Saudi Arabia. *Interdisciplinary Journal of Contemporary Research in Business, 3*(4), 725.

Amado, N., Pratas, H., & Horta, I. (2012). *Teachers and parents` perceptions of conflict in early childhood.* In L. Chova, A. Martínez, and I. Torres (eds.), Proceedings of the 5th International Conference of Education, Research, and Innovation- ICERI 2012 (pp.1165-1171). Madrid: IATED.

Andreea-Mihaela, N. (2014). Education organizations and conflict management: A sociological analysis of the pre-university system. *Revista de Ştiinţe Politice. Revue des Sciences Politiques,* (44), 170-183.

Aydın, İ., Arastaman, G., & Akar, F. (2011). Türkiye 'de ilköğretim okulu yöneticileri ile rehber öğretmenler arasındaki çatışma kaynakları [Sources of conflict between primary school principals and school counsellors in Turkey]. *Education and Science, 36*(160), 199–212.

Bernard, H. R. (2011). *Research methods in anthropology: Qualitative and quantitative approaches.* Rowman & Littlefield Publishers Inc.

Bilton, R., Jackson, A., & Hymer, B. (2018). Cooperation, conflict and control: Parent–teacher relationships in an English secondary school. *Educational Review, 70*(4), 510-526. https://doi.org/10.1080/00131911.2017.1410107

Butterfield, L. D., Borgen, W. A., Amundson, N. E., & Maglio, A. S. T. (2005). Fifty years of the critical incident technique: 1954-2004 and beyond. *Qualitative research, 5(*4), 475-497. https://doi.org/10.1177/146879410505692

Carbonneau, K. J. (2020). Teacher judgments of student mathematics achievement: The moderating role of student-teacher conflict. *Educational Psychology, 40*(10), 1211-1229. https://doi.org/10.1080/01443410.2020.1768223

Ciuladiene, G., & Kairiene, B. (2018, May). *The resolution of conflict between teacher and student: teachers' narratives. In society. Integratıon. Education.* Proceedings of the International Scientific Conference (Vol. 3, p. 235-245). https://doi.org/10.17770/sie2018vol1.3249

Collins R. (2015). *Sosyolojide dört ana gelenek* [Four Sociological Traditions] (Trans: Ümit Tatlıcan). Sentez Publishing.

Crawford, D., & Bodine, R. (1996). *Conflict resolution education: A guide to implementing programs in schools, youth-serving organizations, and community and juvenile justice settings.* Washington DC: US Department of Justice. https://www.ojp.gov/pdffiles/conflic.pdf

Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches.* Sage

Çakmak, E. (2013). *Sosyo-ekonomik açıdan farklı bölgelerdeki ilkokul müdürlerinin öfkeli velilerle çatışma durumlarının incelenmesi* [Examining the conflict situations of primary school principals in socio-economically different regions with angry parents] (Unpublished master thesis). Yıldız Technical University.

Çalık, A. (2021). *Duygusal zekâ ve örgütsel çatışma yönetimi* [Emotional intelligence and organizational conflict management]. Gazi Publishing.

Epstein, J. L., & Sanders, M. G. (1998). What we learn from international studies of school-family-community partnerships. *Childhood Education, 74*(6), 392-394.

Freyer, H. (2012), *Sosyoloji kuramları tarihi* [Sociological theory of history]. Doğu Batı Publishing.

Girgin, S. (2020). *Öğretmenlerin algılarına göre okul yöneticilerinin çatışma yönetim tarzları ile öğretmenlerin örgütsel sessizlik düzeyleri arasındaki ilişki* [The relationship between school administrators' conflict management styles and teachers' organizational silence levels according to teachers' perceptions] (Unpublished doctoral dissertation). İstanbul Okan University.

Gremler, D. D. (2004). The critical incident technique in service research. *Journal of service research, 7*(1), 65-89.

Guo, Y., & Mohan, B. (2008). ESL parents and teachers: Towards dialogue? *Language and Education, 22*(1), 17-33. https://doi.org/10.2167/le731.0

Gwernan-Jones, R., Moore, D. A., Garside, R., Richardson, M., Thompson-Coon, J., Rogers, M., Cooper, P., Stein, K., & Ford, T. (2015). ADHD, parent perspectives and parent–teacher relationships: Grounds for conflict. *British Journal of Special Education, 42*(3), 279-300. https://doi.org/10.1111/1467-8578.12087

Hughes, H., Williamson, K., & Lloyd, A. (2007). Critical incident technique. In S. Lipu, K. Williamson, & A. Lloyd (Eds.), Exploring methods in information literacy research (Vol. 28, p. 49–66). Centre for Information Studies, Charles Sturt University. https://doi.org/10.1016/B978-1-876938-61-1.50004-6

Kainz, K., & Aikens, N. L. (2007). Governing the family through education: A genealogy on the home/school relation. *Equity & Excellence in Education, 40*(4), 301-310. https://doi.org/10.1080/10665680701610721

Kepenekci, Y. K., & Çınkır, Ş. (2006). Bullying among Turkish high school students. *Child abuse & neglect, 30*(2), 193-204.

Karip, E. (2013). *Çatışma yönetimi* [Conflict Management]. Pegem A Publishing.

Kimber, M., & Campbell, M. (2014). Exploring ethical dilemmas for principals arising from role conflict with school counsellors. *Educational Management Administration & Leadership, 42*(2), 207-225. https://doi.org/10.1177/1741143213499259

Koçel, T. (2015). *İşletme yönetimi* [Business Management]. Pegem A Publishing.

Köseoğlu, Ö., & Aydin, İ. (2022). Sosyal ağlar ve örgütsel çatışma: Devlet ilkokullarında bir uygulama [Social networks and organizational conflict: an application in public primary schools]. *Bilgi Journal of Social Sciences, 24(*1), 174-221. https://doi.org/10.54838/bilgisosyal.1084629

Lareau, A., & Muñoz, V. L. (2012). "You're not going to call the shots" structural conflicts between the principal and the PTO at a suburban public elementary school. *Sociology of education, 85*(3), 201-218.

Lasky, S. (2000). The cultural and emotional politics of teacher-parent interactions. *Teaching and Teacher Education, 16*, 843-860. https://doi.org/10.1016/S0742-051X(00)00030-5

Marshall, C., & Rossman, G. B. (2014). *Designing qualitative research.* Sage publications.

Merriam, S. B., & Grenier, R. S. (Eds.). (2019). *Qualitative research in practice: Examples for discussion and analysis.* John Wiley & Sons.

Nikolaou, P. (2018). Effective strategies for human resource management in educational organizations. Conflict management case studies. *Journal of Contemporary Education, Theory and Research, 2*(2), 30-34.

Özge Sağbaş, N., & Özkan, C. (2022). Veli ile yaşanan çatışmanın öğretmen performansına etkisine ilişkin öğretmen görüşleri [Teachers' views on the effect of conflict with parents on teacher performance]. *Nevşehir Hacı Bektaş Veli University Journal of ISS, 12*(1), 414-433. https://doi.org/10.30783/nevsosbilen.983282

Peters, M., Seeds, K., Goldstein, A., & Coleman, N. (2008). *Parental involvement in children's education 2007.* BMRB Social Research, Department for children, schools and families.

Podolchak, N. Y., Kovalchuk, G. R., & Blynda, Y. O. (2016). *Evaluation management conflicts as an economic security approach.* In International Scientific Days (ISD) Conference on Agri Food Value Chain-Challenges for Natural Resources Management Society. http://dx.doi.org/10.15414/isd2016.s4.06

Rahim, M.A. (2001). *Managing conflict in organizations* (3rd Edition). Quorum Books Greenwood Publishing Group.

Robson, C., & McCartan, K. (2016). *Real world research.* Wiley Global Education.

Rodríguez-Ruiz, B., Rodrigo, M. J., & Martínez-González, R. A. (2015). Cross-contextual variability in parents' and school tutors' conflict resolution styles and positive development. *The Journal of Educational Research, 108*(6), 480-491. https://doi.org/10.1080/00220671.2014.905764

Saiti, A. (2015). Conflicts in schools, conflict management styles and the role of the school leader: A study of Greek primary school educators. *Educational Management Administration & Leadership, 43*(4), 582-609. https://doi.org/10.1177/1741143214523007

Saldaña, J. (2013). *The coding manual for qualitative researchers.* London: Sage.

Salleh, M. J., & Adulpakdee, A. (2012). Causes of conflict and effective methods to conflict management at Islamic secondary schools in Yala, Thailand. *International Interdisciplinary Journal of Education, 1*(1), 15-22.

Saltmarsh, S., & McPherson, A. (2022). Un/satisfactory encounters: Communication, conflict and parent-school engagement. *Critical Studies in Education, 63*(2), 147-162. https://doi.org/10.1080/17508487.2019.1630459

Sarıpınar, G. G. (2014). *Meslek liselerinde öğrenim gören öğrencilerin akranları ve öğretmenleri ile yaşadıkları çatışma ile çatışma yönetim stratejileri* [Conflict and conflict management strategies of vocational high school students with their peers and teachers]. (Unpublished master's thesis). Bahcesehir University.

SEGE, (2022). *İlçelerin sosyo-ekonomik gelişmişlik sıralaması* [Socio-economic development ranking of districts] Ministry of Industry and Technology, General Directorate of Development Agencies.

Şahin, A. (2016). *İlköğretim kurumu yöneticilerinin yönetsel ilişkilerinde kullandıkları mizaha ilişkin görüşler ile mizah iklimi, yöneticilerin mizah tarzları ve çatışma yönetimi stratejileri arasındaki ilişki* [The relationship between primary school administrators' views on the humor they use in their managerial relationships and humor climate, administrators' humor styles and conflict management strategies] (Unpublished doctoral dissertation). Akdeniz University.

Şimşek, M. Ş., Akgemci, T., & Çelik, A. (2003). *Davranış bilimlerine giriş ve örgütlerde davranış* [Introduction to behavioral sciences and behavior in organizations]. Adım Publishing

Thijs, J., & Eilbracht, L. (2012). Teachers' perceptions of parent–teacher alliance and student–teacher relational conflict: Examining the role of ethnic differences and "disruptive" behavior. *Psychology in the Schools, 49*(8), 794-808. https://doi.org/10.1002/pits.21635

Trepal, H. C., & Hammer, T. R. (2014). Critical incidents in supervision training: Doctoral students' perspectives. *Journal of Professional Counseling: Practice, Theory & Research, 41*(1), 29-41. https://doi.org/10.1080/15566382.2014.12033931

Türnüklü, A., Kaçmaz, T., Gürler, S., Kalender, A., Zengin, F., & Şevkin, B. (2010). Çatışma çözümü ve akran arabuluculuk eğitiminin öğrencilerin empati becerileri üzerindeki etkileri [The effects of conflict resolution and peer mediation training on students' empathy skills]. *Education and Science, 34*(153), 15-24.

Van Rhijn, T. M., Acai, A., & Lero, D. S. (2018). Measuring School–Family Conflict and Enrichment in University Student Parents: A Measurement Validation Study. *Canadian Journal of Higher Education/Revue canadienne d'enseignement supérieur, 48*(3), 98-124. https://doi.org/10.7202/1057131ar

Vestal, B. D. (2011). *An investigation of preferred conflict-management behaviors in small-school principal* (Unpublished doctoral dissertation). Texas A and M University.

Xie, X., & Jiang, G. (2021). Chinese tertiary-level English as a foreign language teachers' emotional experience and expression in relation to teacher-student interaction. *Frontiers in Psychology, (12).* https://doi.org/10.3389/fpsyg.2021.759243

Yılmaz, F., & Öztürk, H. (2012). Hastanelerde yönetici hemşirelerin karşılaştıkları çatışma nedenleri ve çatışma yönetim yaklaşımları [Causes of conflict and conflict management approaches faced by nurse managers in hospitals]. *Florence Nightingale Journal of Nursing, 19*(3), 145-152.

Zembat, R. (2012). Okul öncesi öğretmenlerinin okul yöneticisi, meslektaşları ve aileler bağlamında algıladıkları çatışma durumlarının incelenmesi [Examining the conflict situations perceived by preschool teachers in the context of school administrators, colleagues and parents]. *Education and Science, 37*(163), 203-215.

**About the authors**

**Metin ÖZSOY**
Metin Özsoy is a PhD student at the Department of Educational Sciences in the Faculty of Education at Yildiz Technical University. He has studied in the fields of human resources in education, educational psychology, higher education, and andragogy.

**Erkan TABANCALI**
Erkan Tabancalı is an associate professor at the Department of Educational Sciences in the Faculty of Education at Yildiz Technical University. He has studied leadership, higher education, organizational culture, and human resources in education.

IOJPE