

INVESTIGATING THE BOUNDARIES OF PRIMARY STUDENTS EXPLORING FUNDAMENTAL PAINTING TECHNIQUES IN SCHOOL: AN ANALYSIS OF EFFECTS FOR AT-RISK STUDENTS IN CHINA

Lu Qijun¹, Han Tingting²

School of Fine Arts, Jingdezhen Ceramic University¹ Fine Arts School Affiliated to Central
Academy of Fine Arts, Central Academy of Fine Arts², 848167487@qq.com ,
yaya1726@126.com

Abstract

This study aims to investigate the impact of exploring fundamental painting techniques on the academic and socio-emotional development of at-risk primary students in China. With a focus on the boundaries of artistic exploration within a structured educational setting, this research seeks to understand how art education can be leveraged to enhance the learning experiences and outcomes of students facing various risk factors. The study utilized a quantitative research methodology, employing survey questionnaire to collect data from 80 participants. The analysis included descriptive statistics, inferential techniques such as T-tests and Chi-square tests, and Cronbach Alpha analysis using SPSS to examine the collected data. The study explores potential correlations between participation in art education and improvements in academic performance among at-risk students. The results shows that the study took sample of a diverse representation of at-risk students with variety exposure of art education across China. The recorded Cronbach's Alpha of 0.863 indicates that most items are likely suitable for retention. While for the inferential statistical analysis, including T-Tests and Chi-Square Tests, it revealed that there are a statistically significant association between Art Education Experience and Holistic Development ($p = 0.049$). The findings of this research will provide empirical evidence supporting the integration of art education as a means of enhancing academic outcomes for at-risk primary students in China.

Keyword: Primary Students, Art Education, At-Risk Students, School-Based Intervention, Academic Performance.

Introduction

Fundamental painting techniques are the essential skills and methods that form the basis of painting as an art form. These techniques encompass a range of skills, from understanding color theory and mixing paints to mastering brushwork and composition. Drawing, which includes sketching and outlining, is also a fundamental skill in painting. Additionally, artists need to learn how to apply paint in various ways, such as layering to create depth, blending to achieve smooth transitions, and using techniques like highlighting and shading to add dimension. Understanding how to create texture and manipulate the surface of the painting is also crucial. These techniques

collectively enable artists to express their creativity effectively on canvas or other surfaces, laying the groundwork for more advanced artistic expression.

Art education is of paramount importance for primary students as it contributes significantly to their holistic development. Beyond the realm of creativity and self-expression, art education plays a crucial role in fostering critical thinking, problem-solving skills, and emotional intelligence (Omasta, M., et. al. 2021). Through various art forms such as drawing, painting, and sculpting, students learn to observe, analyze, and interpret visual information, honing their abilities to think critically and make informed decisions. Moreover, art serves as a powerful tool for communication, allowing children to express their thoughts, emotions, and experiences in a non-verbal manner, thereby enhancing their communication skills and empathy towards others. Art education also plays a vital role in promoting cultural awareness and appreciation, as it exposes students to diverse artistic traditions and perspectives from around the world, fostering a sense of global citizenship. Additionally, engagement in art activities contributes to the development of fine motor skills, hand-eye coordination, and concentration, which are essential for academic success. Overall, art education in primary schools' nurtures well-rounded individuals who are not only academically competent but also creative, empathetic, and culturally aware, preparing them for future challenges in a dynamic world.

Significance of addressing at-risk students in China

This study focuses on at risk students. In China, at-risk students encompass a diverse group facing various challenges that can hinder their educational success (Li, H., Ding, W., & Liu, Z., 2020). This includes children from low-income families who may struggle with financial barriers, limiting their access to resources and support. Rural students often face obstacles such as limited educational infrastructure and fewer opportunities for academic and personal development compared to urban peers. Migrant children, especially those from rural to urban areas, may encounter difficulties due to residency restrictions, language barriers, and social integration issues. Students with disabilities might face challenges related to inclusive education and specialized support services. Ethnic minority students may confront cultural and linguistic barriers, along with discrimination and limited resources. Left-behind children, separated from their parents working in urban areas, may experience emotional and psychological issues due to family separation. Finally, students with behavioral or academic challenges may struggle without appropriate interventions and support. Addressing the needs of these at-risk students in China requires targeted efforts to overcome their specific hurdles and ensure they have equal opportunities for educational success. Addressing at-risk students in China is significant not only for the well-being of the students themselves but also for the overall development and prosperity of the nation. It reflects a commitment to equality, social justice, and the long-term success of the country.

Research Problem and Objectives

The research aims to investigate the impact of exploring fundamental painting techniques among at-risk primary students in China, focusing on how this exposure influences their cognitive

development, emotional expression, and academic engagement. By examining the effects of art education on at-risk students, the study seeks to identify potential benefits such as improved academic performance, enhanced emotional well-being, and increased social integration. Additionally, it aims to explore the challenges these students may face in accessing art education and how these challenges can be addressed to ensure equitable opportunities for all students. The research problem seeks to contribute to a better understanding of the role of art education in supporting at-risk students' overall development and academic success in the Chinese context.

Scope and Limitations

This research encompasses primary students in China who are considered at-risk due to various factors such as socio-economic background, disability, rural residence, or migrant status. The study focuses on exploring how the introduction of fundamental painting techniques in school settings influences the cognitive, emotional, and social development of these at-risk students. It includes an examination of the impact of art education on academic engagement, creative expression, and overall well-being. The research aims to provide insights into the potential benefits of art education for at-risk students and how it can be used as a tool for promoting their holistic development.

Several limitations of the research is that the study's findings may be influenced by the specific context of the schools and students involved, limiting the generalizability of the results to a broader population. Additionally, the research may face challenges in accurately measuring the impact of art education on at-risk students, as other external factors could also influence their development.

Overview of Art Education for Primary Students

Art education for primary students is recognized as a vital component of their holistic development, contributing to their cognitive, emotional, and social growth. Through engaging in artistic activities such as drawing, painting, sculpture, and multimedia arts, students not only develop their creative skills but also enhance their critical thinking, problem-solving abilities, and emotional intelligence (Peca, L. C., 2013).

One of the key benefits of art education for primary students is its role in promoting creativity and innovation. According to O'Thearling, S., & Bickley-Green, C. A. (1996), by providing opportunities for self-expression and exploration of different artistic mediums, art education stimulates students' imaginations and encourages them to think outside the box. This fosters creativity, which is increasingly recognized as a crucial skill for success in the 21st-century workforce.

Moreover, art education plays a significant role in enhancing students' visual literacy and aesthetic awareness (Larose, S., Duchesne, S., & Châteauvert, G. B., 2020). Through exposure to various art forms and styles, students learn to appreciate and analyze visual information, developing their abilities to interpret and critique artworks. This not only enriches their cultural experiences but also nurtures their ability to engage critically with the visual world around them.

Art education also has a positive impact on students' emotional and social development (Olshansky, B., 2007). Through artmaking, students can express their thoughts, feelings, and experiences in a non-verbal manner, providing a means of communication that transcends language barriers. This can be particularly beneficial for students who may struggle with verbal expression or have difficulty articulating their emotions.

Furthermore, art education can contribute to a sense of community and belonging among students. Collaborative art projects and group activities promote teamwork, communication, and cooperation, fostering a supportive learning environment where students can learn from each other's perspectives and skills.

While the benefits of art education for primary students are well-documented, challenges exist in ensuring equitable access to quality art education for all students. Factors such as limited resources, standardized testing pressures, and curricular constraints can pose barriers to the implementation of comprehensive art programs in schools.

Historical Context of Art Study

The historical context of art education for primary students has evolved significantly over time. In ancient civilizations such as Greece, Egypt, and China, art education was an integral part of the curriculum, focusing on developing skills in painting, sculpture, and other artistic disciplines. During the Renaissance in Europe, art education became more formalized, with artists like Leonardo da Vinci and Michelangelo emphasizing the importance of artistic training for intellectual and moral development.

In the 19th century, the industrial revolution led to changes in art education, with a shift towards more structured and standardized approaches (Wright, D. C., 2020). Art schools and academies were established, aiming to provide formal training in artistic techniques and principles. This period also saw the emergence of influential art educators such as Johann Pestalozzi and Friedrich Froebel, who advocated for the integration of art into the broader educational curriculum as a means of fostering creativity and holistic development.

In the 20th century, art education underwent further transformations influenced by movements such as Bauhaus and the progressive education movement. These movements emphasized the importance of art as a means of self-expression, experimentation, and social critique. Art education in schools began to focus more on individual creativity and exploration, moving away from strict academic traditions.

In the present day, art education for primary students continues to evolve in response to changing educational philosophies, technological advancements, and cultural shifts. There is a growing recognition of the importance of art education in fostering creativity, critical thinking, and cultural awareness among students. One current trend is the integration of technology into art education, with digital art tools and multimedia platforms being used to enhance students' artistic skills and creativity (Hung, et al., 2019 & Harpazi, et. al., 2020). This includes the use of digital drawing tablets, graphic design software, and virtual reality tools that provide new avenues for artistic expression and experimentation.

In terms of practices, there is a growing emphasis on student-centered learning approaches in art education, where students are encouraged to take an active role in their learning through inquiry-based projects, collaborative activities, and hands-on experiences. This approach emphasizes the process of artmaking rather than just the final product, fostering a deeper understanding of artistic concepts and techniques. There is a renewed focus on cultural diversity and inclusivity in art education, with efforts to incorporate diverse perspectives and artistic traditions into the curriculum. This includes initiatives to ensure that art education is accessible to students from diverse backgrounds and that it reflects the cultural richness of the global community.

Overall, current trends and practices in art education for primary students reflect a growing recognition of the importance of creativity, cultural awareness, and interdisciplinary learning in preparing students for the challenges of the 21st century.

Impact of Art Education on At-Risk Students

Previous studies on the effects of art education have explored various aspects of how engaging in artistic activities can influence individuals across different age groups, educational settings, and cultural backgrounds. These studies have examined the impact of art education on cognitive development, academic performance, social skills, emotional well-being, and overall holistic development.

For the cognitive development, art education has been linked to improvements in cognitive abilities such as problem-solving, critical thinking, creativity, and spatial reasoning (Prediger, S., et. al., 2023). Engaging in artistic activities often requires individuals to think critically, analyze visual information, and make decisions, which can enhance cognitive skills. Zhang, H., & Luo, F. (2020) have suggested a positive correlation between participation in art education and academic achievement. Students who are involved in arts programs have shown improvements in academic performance, particularly in subjects like mathematics and language arts.

Asides from that, their social skills were improved too. Brown, E. D., Benedett, B., & Armistead, M. E. (2010) mentioned that art education encourages collaboration, communication, and teamwork, which are essential social skills. Students who participate in art-related activities often develop better interpersonal skills, empathy, and a sense of community. Engaging in art can be therapeutic and has been associated with improved emotional well-being. Artistic expression allows individuals to express themselves, cope with stress, and explore their emotions in a safe and creative way (Sheaffer, A. W., et. al. 2021).

Art education is often viewed to foster holistic development, nurturing not only cognitive and academic skills but also emotional, social, and cultural awareness. It can contribute to a well-rounded education that addresses the diverse needs of students. Baneres, D., Rodríguez-Gonzalez, M. E., & Serra, M. (2019) also mentioned that art education provides a platform for students to a better cultural understanding because students got to explore diverse cultures, traditions, and perspectives through artistic expression (Moula, Z., 2020). This exposure can promote cultural understanding, tolerance, and appreciation for diversity.

Theoretical Framework

In art education, several relevant theories inform teaching practices and curriculum development, shaping how educators approach the teaching and learning of art. One of them is Visual Culture Theory. This theory examines the role of visual images and artifacts in shaping culture and society. In art education, this theory emphasizes the importance of teaching students to critically analyze and interpret visual information, including artworks, advertisements, and media images, to understand their cultural significance and impact (Moeyaert, M., et. al., 2021). It provides a theoretical framework for understanding how students learn and how art can be effectively taught and integrated into the broader educational curriculum. By applying these theories in practice, art educators can create meaningful learning experiences that foster creativity, critical thinking, and cultural awareness in students.

According to Stepney, S. A. (2017), when applying the Visual Culture Theory to at-risk student populations in art education, educators can adopt teaching practices that prioritize active engagement, personalized learning, and the development of critical thinking skills. By providing hands-on, experiential learning experiences, educators can create opportunities for at-risk students to construct their own understanding of artistic concepts and techniques through direct engagement with art materials. Scaffolding and support are essential components of this approach, as educators can guide students through the artistic process, offering feedback and resources tailored to their individual needs. Personalized learning becomes crucial in recognizing and accommodating the diverse learning styles and abilities of at-risk students, allowing them to explore art in ways that are meaningful and relevant to their experiences. Collaboration and reflection are also key aspects, as at-risk students can benefit from working together on art projects and engaging in reflective practices that promote metacognition. By integrating these principles into art education, educators can create a supportive and empowering learning environment that nurtures the creativity and potential of at-risk students, helping them develop the skills and confidence needed for future success.

Methodology

This research employs experimental research approach which involves manipulating an independent variable (in this case, the introduction of fundamental painting techniques in school) to observe its effect on a dependent variable (such as academic performance, emotional well-being, etc., among at-risk students). This method allows for the establishment of cause-and-effect relationships and can help determine the specific impact of art education on at-risk students.

This research is done in a controlled environment where researchers can control and manipulate variables to isolate the effects of art education on at-risk students. This control helps minimize the influence of extraneous variables, enhancing the internal validity of the study.

By using this research methods, researchers can gain a more comprehensive understanding of how art education impacts at-risk students in China. Experimental studies can establish causal relationship, explore associations and patterns in real-world contexts, providing valuable insights

for educators, policymakers, and stakeholders interested in supporting the needs of at-risk students through art education.

Results

For this study, several demographic data points were gathered. A set of questionnaires were distributed to 80 students. This questionnaire aims to analyze these demographic data points so that researchers can better understand the context in which the study's interventions are taking place and how different factors might influence the outcomes for at-risk primary students exploring painting techniques in China.

- i. Gender: A 57.5% of males and 42.5% of females were involved in the study. Data on the gender distribution of the participants can help analyze potential gender-specific effects or differences in responses to the painting techniques.
- ii. Socioeconomic Status (SES): Considering the study focuses on at-risk students, gathering information on their socioeconomic status can provide insights into how economic factors might influence their experience and outcomes in the study. This study was mostly answered by the third income quartile category (32.5%) followed by second (30%), first (23.7%) and fourth (13.7%)
- iii. Location: 75% of respondents were coming from urban areas while 15% were from rural. The geographical location of the schools or communities where the study takes place will be a relevant information, as regional differences might impact the availability of resources or the cultural context of the students' experiences.
- iv. Art Education Experience: A total of 53.7% respondents had a medium exposure of art education, followed by 32.5% with high exposure and 13.7% with low exposure of art education. Gathering data on whether the students have had previous exposure to art education or painting techniques can help assess the impact of the study's intervention in comparison to their prior experiences.
- v. Special Education Status: For at-risk students, it may be relevant to collect data on whether any of them have special education needs, as this could impact their responses to the painting techniques and their overall experience in the study. In this study, there were a total of 70% respondents who were introduced with Special Education while the remaining has no exposure about it.
- vi. Parental Involvement: There were a few 53.7% respondents who had medium parental involvement, followed by 32.5% with high involvement and, 13.7% with low involvement. Information about the level of parental involvement in the students' education and artistic activities can provide insights into the support systems available to them outside of school.

Table 1- Descriptive Statistics for Demographic Analysis.

Variables	N=80	Percentage %
Gender		
• Male	46	57.5
• Female	34	42.5
Socioeconomic Status Income quartile		
• First	19	23.7
• Second	24	30
• Third	26	32.5
• Fourth	11	13.7
Location		
• Urban	63	75
• Rural	17	15
Art Education Experience		
• High	26	32.5
• Medium	43	53.7
• Low	11	13.7
Special Education Exposure		
• Yes	56	70
• No	24	30
Parental Involvement		
• High	26	32.5
• Medium	43	53.7
• Low	11	13.7

Then, the total of 80 sets collected data were analysed using Cronbach's alpha to test on the reliability. Cronbach's alpha is calculated based on the average intercorrelations between all the items in the scale, and it provides researchers with a quantitative estimate of the reliability of the instrument. A higher alpha value indicates greater confidence in the consistency and reliability of the instrument's measurements.

The accepted value for the reliability should exceed 0.70. In this study, the overall Cronbach's alpha is 0.863, which means, most items appeared to be worthy of retention, resulting in a decrease in the alpha if deleted. While for each key factor, all show an excellent strength of reliability where the alpha coefficient was more than 0.7. As seen in table 2, the resulting values ranged from 0.772 to 0.805.

Table 2. Cronbach's Alpha Value for Each Item

Item	No of Item	Cronbach's Alpha Value	Mean	Std Deviation
Cognitive Development	7	0.837	31.36	3.672
Academic Performance	4	0.829	17.29	2.648
Social Skills	5	0.796	21.73	2.798
Emotional Well-being	4	0.814	17.09	2.448
Holistic Development	7	0.805	31.64	3.526
Cultural Understanding	3	0.772	10.59	2.823

From the analysis, it shows that all factors display reliability and has internal consistency. In the future, this model will be used to collect large scale data and wider coverage of respondents for further analysis and model development.

Inferential analysis for the boundaries of primary students exploring fundamental painting techniques in school with at-risk students is important for the study on the boundaries of primary students exploring fundamental painting techniques in school with at-risk students. The analysis is essential to draw meaningful conclusions from research data and understanding the broader implications of the study findings.

Table 3- Inferential Statistics Results

Statistical Test	Test Description	Test Statistic	p-Value
T-Test	Art education experience with holistic development	2.021	0.049
Chi-Square Test	Relationship between parental involvement and academic performance	3.756	0.050

A T-Test was conducted to examine the relationship between art education experience with holistic development. Results revealed a statistically significant difference in textiles preferences between participants with different residing backgrounds ($p = 0.049$). Specifically, students who had exposure on art education experience exhibited a more holistic development compared to those who have lower art education exposure.

A Chi-Square Test was used to explore the association between Parental Involvement and Academic Performance. The analysis show that there are statistically significant association between Parental Involvement and Academic Performance ($p = 0.050$). This means that the level

of parental involvement in a child's education has a measurable impact on their academic achievements.

The inferential statistical analyses provide valuable insights into the relationships between socioeconomic status (SES), location, previous art education experience, special education status, parental involvement towards the development of at-risk students in China. The findings suggest that between art education experience play a role in with holistic development, while parental involvement have a significant influence on academic performance. These insights contribute to a better understanding of the factors that contribute to the impact of at-risk students in China that explores fundamental painting techniques in school.

Discussion

Art education experience plays a pivotal role in fostering holistic development by nurturing various aspects of a student's growth. Through creative expression, students develop critical thinking skills, learning to analyze, interpret, and solve problems in innovative ways. Art also serves as a powerful medium for emotional expression, allowing students to explore and understand their feelings while developing empathy for others. Exposure to diverse artistic traditions and styles broadens students' cultural and historical understanding, fostering appreciation for diversity and a global perspective. Art projects often require collaboration and communication, honing students' interpersonal skills and ability to work in teams. Additionally, hands-on artistic activities contribute to the development of fine motor skills and hand-eye coordination, which are essential for various daily tasks. Overall, art education not only nurtures students' creativity but also contributes to their cognitive, emotional, social, and physical development, providing a well-rounded foundation for lifelong learning and personal growth.

The association between parental involvement and academic performance is not merely coincidental but is supported by strong evidence from the data (Walker, S., & Graham, L., 2021). This finding suggests that parents who are more involved in their children's education, whether through activities like helping with homework, attending parent-teacher meetings, or providing a supportive learning environment at home, tend to have children who perform better academically. According to Feinberg, et. al., (2021), it underscores the importance of parental engagement in shaping a child's educational outcomes and highlights the potential benefits of fostering a collaborative partnership between parents and schools to support student success.

Art education for at-risk students in China holds several positive implications that can significantly impact their overall well-being and prospects. Firstly, art education provides a creative outlet that allows at-risk students to express themselves in ways that may not be possible through traditional academic subjects. This can be particularly beneficial for students who struggle with verbal expression or have experienced trauma, as art can serve as a therapeutic tool for processing emotions and experiences (Demirel, İ. N., & Buyurgan, S., 2017). Secondly, art education can boost self-esteem and confidence in at-risk students by providing opportunities for success and recognition outside of traditional academic measures. This can be especially important for students who may feel marginalized or overlooked in more traditional educational settings. Thirdly, art

education encourages problem-solving skills and critical thinking, which are valuable skills for navigating challenges in both academic and real-world settings. By engaging in creative processes and finding innovative solutions to artistic challenges, at-risk students can develop resilience and adaptability. Additionally, art education can provide at-risk students with a sense of purpose and belonging. Engaging in artistic activities can create a sense of community and belonging, which can be particularly valuable for students who may feel isolated or disconnected from their peers. Finally, art education can open up new avenues for future success and personal growth. For at-risk students who may face additional barriers to academic achievement or career opportunities, the skills and experiences gained through art education can provide valuable foundations for future endeavors in both artistic and non-artistic fields. Overall, art education for at-risk students in China can have a transformative impact, offering avenues for personal expression, skill development, and positive social and emotional growth.

Recommendations

Several recommendations can be made based on this study. Firstly, the integration of art education programs. Schools should integrate art education programs that focus on fundamental painting techniques into their curriculum, especially for at-risk students. These programs should be designed to be inclusive and accessible, catering to the diverse learning needs of at-risk students. Secondly is, the educators should receive professional development and training in art education methods tailored to at-risk student populations (Swan, M., 2011). This training should emphasize strategies for engaging at-risk students in art activities and addressing their unique learning challenges.

Next recommendation would be the support for creative expression. Schools should provide a supportive environment that encourages creative expression through art. This includes allocating resources for art supplies, creating dedicated art spaces, and promoting a culture that values artistic exploration and experimentation. Art education should also be integrated with other subjects to provide a holistic learning experience for at-risk students. Collaborative projects that combine art with subjects like history, science, or literature can enhance students' understanding and engagement.

Aside from that is the parent and community involvement. Schools should involve parents and the community in supporting art education initiatives for at-risk students. This can include organizing art exhibitions, workshops, and other events that showcase students' artistic achievements and foster community engagement. Monitoring and evaluation in schools should be done regularly on at-risk students. This can involve tracking academic performance, attendance, behavior, and other relevant indicators to assess the effectiveness of the programs.

By implementing these recommendations, schools can create a supportive and enriching environment that maximizes the benefits of art education for at-risk students in China, promoting their academic success, creativity, and overall well-being.

Conclusion

In conclusion, art education for primary students is fundamental for fostering their creativity, critical thinking, and emotional well-being. By incorporating art into the curriculum, schools can create a holistic learning environment that nurtures students' artistic expression and appreciation for the arts. This exposure to art enables students to develop their creative abilities, encouraging them to think outside the box and explore innovative solutions to problems. Moreover, engaging with art can enhance students' emotional well-being by providing a means of self-expression and reflection. Art allows students to communicate their thoughts and feelings in a non-verbal manner, which can be particularly beneficial for those who may struggle to express themselves verbally.

Furthermore, art education exposes students to diverse cultures and perspectives, promoting cultural literacy and empathy. Through the study of art from different historical periods and cultural traditions, students gain a deeper understanding of the world around them and the people who inhabit it. This cultural literacy is essential for students to become global citizens who appreciate and respect diversity.

Overall, art education plays a crucial role in the development of well-rounded individuals. By fostering creativity, critical thinking, and emotional well-being, art education equips students with essential skills and qualities that extend beyond the art classroom. It empowers them to approach challenges with creativity and open-mindedness, preparing them for success in both academic and personal pursuits.

References

- Baneres, D., Rodríguez-Gonzalez, M. E., & Serra, M. (2019). An early feedback prediction system for learners at-risk within a first-year higher education course. *IEEE Transactions on Learning Technologies*, 12(2), 249-263.
- Brown, E. D., Benedett, B., & Armistead, M. E. (2010). Arts enrichment and school readiness for children at risk. *Early Childhood Research Quarterly*, 25(1), 112-124.
- Demirel, İ. N., & Buyurgan, S. (2017). Analysing the relationship between critical thinking skills and problem behaviours of children at social risk through visual arts education.
- Feinberg, E., Augustyn, M., Broder-Fingert, S., Bennett, A., Weitzman, C., Kuhn, J., & Blum, N. J. (2021). Effect of family navigation on diagnostic ascertainment among children at risk for autism: A randomized clinical trial from DBPNet. *JAMA pediatrics*, 175(3), 243-250.
- Harpazi, S., Regev, D., Snir, S., & Raubach-Kaspy, R. (2020). Perceptions of art therapy in adolescent clients treated within the school system. *Frontiers in psychology*, 11, 518304.
- Hung, J. L., Shelton, B. E., Yang, J., & Du, X. (2019). Improving predictive modeling for at-risk student identification: a multistage approach. *IEEE Transactions on Learning Technologies*, 12(2), 148-157.
- Larose, S., Duchesne, S., & Châteauevert, G. B. (2020). How does mentoring by teachers improve the adjustment of academically at-risk students in high school?. *International Journal of School & Educational Psychology*, 8(1), 36-49.

- Li, H., Ding, W., & Liu, Z. (2020). Identifying at-risk K-12 students in multimodal online environments: a machine learning approach. *arXiv preprint arXiv:2003.09670*.
- Moeyaert, M., Klingbeil, D. A., Rodabaugh, E., & Turan, M. (2021). Three-level meta-analysis of single-case data regarding the effects of peer tutoring on academic and social-behavioral outcomes for at-risk students and students with disabilities. *Remedial and Special Education, 42*(2), 94-106.
- Moula, Z. (2020). A systematic review of the effectiveness of art therapy delivered in school-based settings to children aged 5–12 years. *International Journal of Art Therapy, 25*(2), 88-99.
- Olshansky, B. (2007). Impact of an Art-and-Literature-Based Approach on Writing and Reading Skills of At-Risk. *Arts & Learning Research, 23*(1).
- Omasta, M., Graham, M., Milling, S. L., Murray, E., Jensen, A. P., & Siebert, J. J. (2021). Social emotional learning and the national core arts standards: a cross-disciplinary analysis of policy and practices. *Arts Education Policy Review, 122*(3), 158-170.
- O'Thearling, S., & Bickley-Green, C. A. (1996). Art education and at-risk youth: Enabling factors of visual expression. *Visual Arts Research, 20*-25.
- Peca, L. C. (2013). Qualitative Narrative Research Investigating the Value of Visual Art Education Captured through the Stories of High School Students Labeled At-Risk.
- Prediger, S., Dröse, J., Stahnke, R., & Ademmer, C. (2023). Teacher expertise for fostering at-risk students' understanding of basic concepts: conceptual model and evidence for growth. *Journal of Mathematics Teacher Education, 26*(4), 481-508.
- Sheaffer, A. W., Majeika, C. E., Gilmour, A. F., & Wehby, J. H. (2021). Classroom behavior of students with or at risk of EBD: Student gender affects teacher ratings but not direct observations. *Behavioral Disorders, 46*(2), 96-107.
- Stepney, S. A. (2017). *Art therapy with students at risk: Fostering resilience and growth through self-expression*. Charles C Thomas Publisher.
- Swan, M. (2011). Designing tasks that challenge values, beliefs and practices: A model for the professional development of practicing teachers. *Constructing knowledge for teaching secondary mathematics: Tasks to enhance prospective and practicing teacher learning, 57*-71.
- Walker, S., & Graham, L. (2021). At risk students and teacher-student relationships: student characteristics, attitudes to school and classroom climate. *International Journal of Inclusive Education, 25*(8), 896-913.
- Wright, D. C. (2020). *The history of China*. Bloomsbury Publishing USA.
- Zhang, H., & Luo, F. (2020). The development of psychological and educational measurement in China. *Chinese/English Journal of Educational Measurement and Evaluation 1*(1), 7.