TPM Vol. 32, No. S6, 2025
ISSN: 1972-6325
https://www.tpmap.org/

RESEARCH ON THE EFFECTIVENESS OF MULTIMEDIA COMPUTER-ASSISTED INSTRUCTION ON BULLYING AWARENESS IN ELEMENTARY STUDENTS WITH LEARNING DISABILITIES

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ABSTRACT:
This investigation examines the impact of multimedia computer-assisted instruction (MCAI) integrated into a bullying awareness curriculum on enhancing the capacity of elementary students with learning disabilities to recognize and respond to bullying. Employing a single-case research design with multiple probe techniques, the study assesses immediate and sustained effects on bullying awareness among three fourth-grade participants from a resource class in New Taipei City, Taiwan. Findings indicate that MCAI significantly improves bullying awareness, with effects persisting post-intervention, suggesting its potential as an effective pedagogical tool for special education contexts.

Keywords: Bullying Awareness; Elementary Education; Learning Disabilities; Multimedia Computer-assisted Instruction; Single-case Research

1] INTRODUCTION:

Learners with learning disabilities frequently encounter a mix of everyday hurdles—difficulties such as making friends and sorting out routine tasks—that generally drain motivation and lead to discouragement. When even a small win that might boost self-esteem fails to materialize, isolation can set in and vulnerability to campus bullying increases [1, 4]. It is not unusual to observe low academic marks, noticeable physical or emotional quirks, and sometimes disruptive behavior that deviates from standard classroom expectations [7]. In many cases, these distinctive traits end up not only tagging a student as a target but also sidelining the individual, since timely help almost never arrives; this, in turn, can inadvertently embolden bullies [20, 8]. Overall, research tends to agree—across various school settings—that these issues persist long enough to warrant well-targeted support and intervention strategies [5].

At the same time, new technology is shaking up education. Multimedia computer-assisted instruction (MCAI) blends text, graphics, sound, animation, and video in unexpectedly interactive ways that allow learners to steer their own education in real time [17, 2]. This approach isn't the old, static lesson format; instead, it offers a hands-on experience that grabs attention, employs repetition, and uses almost immediate feedback to help key ideas settle in [21]. For example, Taiwan's recently updated Campus Bullying Prevention Guidelines (amended April 17, 2024 [12]) now encourage creative teaching practices that echo global trends—practices that were even discussed at the Dignity of Work forum (March 19, 2025), where support for persons with disabilities also got a nod. Several studies indicate, with some pleasant consistency, that MCAI works wonders in engaging special-needs learners ([16]—and, it might be added, sometimes truly delivers impressive outcomes [11]). Building on earlier successes with varied instructional techniques, the present study employs MCAI to craft a bullying awareness curriculum designed to help elementary students with learning disabilities identify and address bullying more effectively [6].

Guided by this broader background, the research pursues two main objectives. First, an investigation is launched to assess—and almost right from the beginning—how well MCAI boosts bullying awareness among these young learners using single-subject methods [3]. Second, the inquiry explores whether such heightened awareness endures over time, thereby laying the groundwork for more lasting bullying prevention strategies [1].

2] LITERATURE REVIEW:

School bullying remains a stubborn problem in educational systems around the globe, and its impact tends to hit students with special needs particularly hard; research in most cases has juggled a variety of approaches to ease this damaging behavior, sometimes merging action research with the creative use of digital tools and multimedia in ways that do not follow any strict formula. For instance, one study by Wang (2010), documented in a master's thesis at National Chiayi University, investigated how a life education curriculum combined with team teaching might lower bullying behaviors [1]. At another turn, Hsu (2021) explored using picture books in classrooms with third graders, finding that this method can boost empathy and awareness amid efforts to curb bullying [9]—and in a similar vein, He (2018) introduced news videos into the mix during anti-bullying lessons for fifth graders in New Taipei City, with outcomes suggesting a deeper grasp of bullying dynamics [6]. The situation gets even more complex when considering that students with disabilities often bear a heavier burden; studies have probed their unique challenges with noticeable attention. Lin (2012a) examined the links between self-concept, social skills and bullying victimization among elementary students with learning disabilities, revealing some noteworthy connections [4], while another investigation by Lin (2012b) looked at bullying behaviors together with school adjustment challenges among those in senior resource classes—highlighting some of the rough edges of inclusive education [5]. In an additional study, Lin (2013) drew connections between physical and psychological traits and the likelihood of experiencing bullying [7]. Liao (2016) managed to pinpoint stress along with surrounding factors as important drivers for such negative interactions, and Huang (2010) provided a case study that, despite its small-scale approach, captured the coping strategies and emerging resilience in students with learning disabilities facing bullying [18, 14]. Meanwhile, technology has steadily carved out its own role in both bullying prevention and the realm of special education: Tang (2016) developed a multimedia-integrated cyberbullying prevention curriculum for sixth graders, with outcomes showing clear improvements in learning within mixed classrooms [10]; similarly, Zhang (2012) evaluated digital video case teaching and noted substantial enhancements in anti-bullying knowledge, social skills and empathy among sixth graders [15]. Even initiatives at the governmental level have contributed—legal education animations released by the Ministry of Education in 2012 have provided schools with accessible resources, thus offering a fresh tool against campus bullying [11]. Looking toward special education, investigations by Zhu (1997) and Zeng (2002) revealed that computer-assisted instruction can serve as a supportive bridge for students with special needs [2, 22], and Yang et al. (2010) compared computer-aided instruction with conventional teaching methods for students with mild intellectual disabilities, finding that the technological approach tended to spark greater engagement [16]. Not to be forgotten, early advocates like Tsai (1993) and Zhong (1995) broke new ground by championing multimedia computers as pioneering tools within the special education arena [17, 21]. All in all, these scattered and sometimes unpredictably ordered findings generally affirm that integrating bespoke educational practices with innovative technological tools holds promise for diminishing bullying and fostering the resilience needed in those who face its worst impacts.

3] METHODOLOGY:

The research probes the impact of a bullying awareness program set up via multimedia computer-assisted instruction; its focus is on boosting the knack among students with learning disabilities to spot instances of bullying and to react in ways that fit the situation. Adopting a single-case design with a sometimes-unpredictable multiple probe twist, each participant ends up serving as an internal control—which, in most cases, allows for a careful look at individual responses [13]. High variability among learning-disabled students brings about a range of needs in understanding bullying; consequently, the curriculum must be tweaked and personalized to achieve the best outcomes. The framework, as shown in the accompanying figure1., weaves together independent, dependent, and controlled variables in a way that clarifies the overall experimental setup. Purposive sampling landed three fourth-grade students from a resource class in an elementary school in New Taipei City, Taiwan(Table 1.); this choice, albeit somewhat selective, seems well-suited for the study's objectives.

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https://www.tpmap.org/

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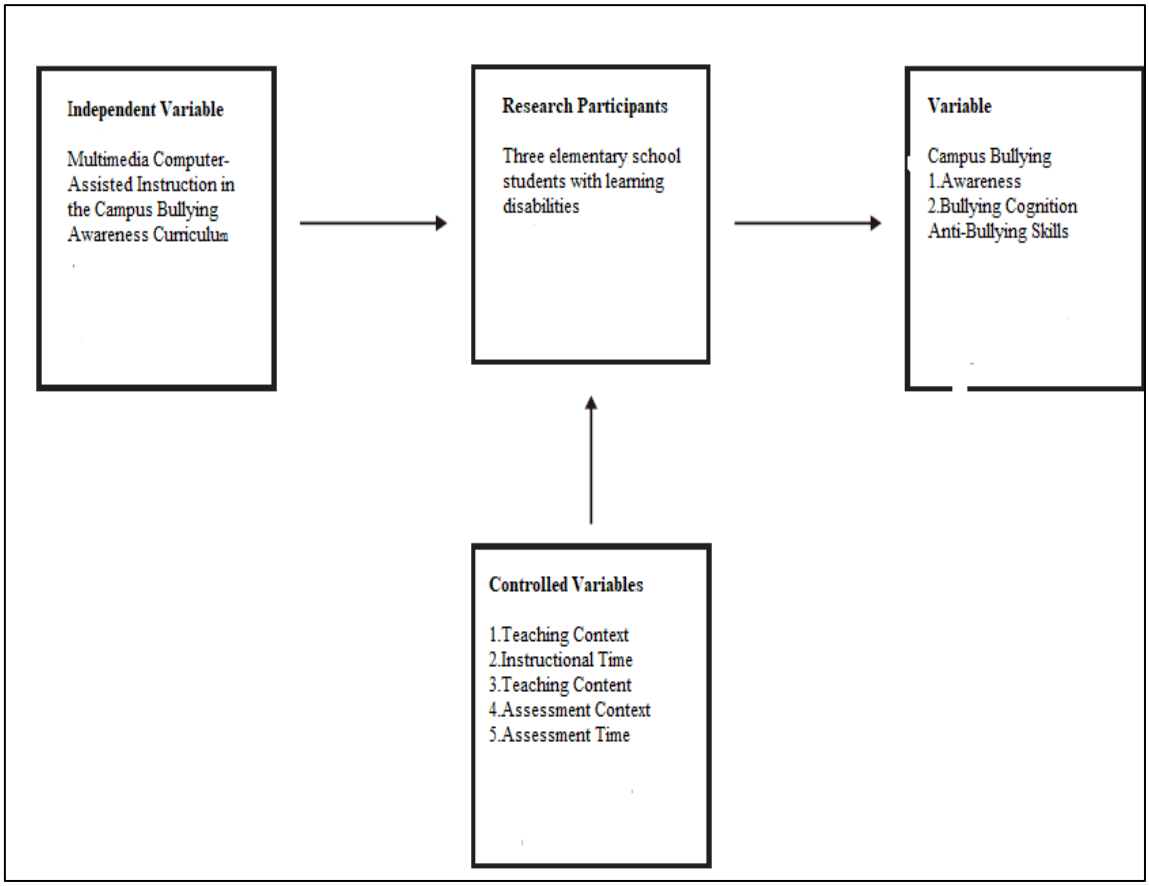

Figure 1. Research Structure.

Table 1. Current Situation Capability of Research Participants

Participants	Participant A	Participant B	Participant C
Grade	4	4	4
Gender	Male	Female	Male
Disability Categories	Learning Disability (Reading)	Learning Disability (Mathematics)	Learning Disability (Writing)
Current Situation of Bullying in School	1.During group assignments in class, there is usually no one who wants to team up with him. 2.He often wanders alone during breaks and only interacts with classmates when he arrives at the resource class.	1.Engages in stealing behavior. 2.Spreads rumors about classmates. 3.Classmates exclude him and do not interact with him.	1.Frequently becomes a target of verbal attacks and exclusion.

4] RESULT

Figure 2 illustrates that all three participants underwent 12 sessions of multimedia computer-assisted instruction focused on campus bullying awareness. Data points from the intervention phase consistently exceeded those of the baseline phase, indicating a strong immediate effect of the intervention on the target behavior of "campus bullying awareness" for all three participants. Although the percentage of effectiveness during the maintenance phase slightly decreased compared to the intervention phase, all data points remained above the baseline, suggesting that the target behavior of "campus bullying awareness" was sustained following the withdrawal of the multimedia computer-assisted instruction. Collectively, these findings demonstrate that multimedia computer-assisted instruction enhances the target behavior of "campus bullying awareness" among elementary students with

learning disabilities, with the effect persisting after the conclusion of the curriculum. Table 2 consolidates the learning outcomes of this study, revealing that the multimedia computer-assisted instruction on campus bullying awareness produced both immediate and sustained effects on the "campus bullying awareness" of the three participants.

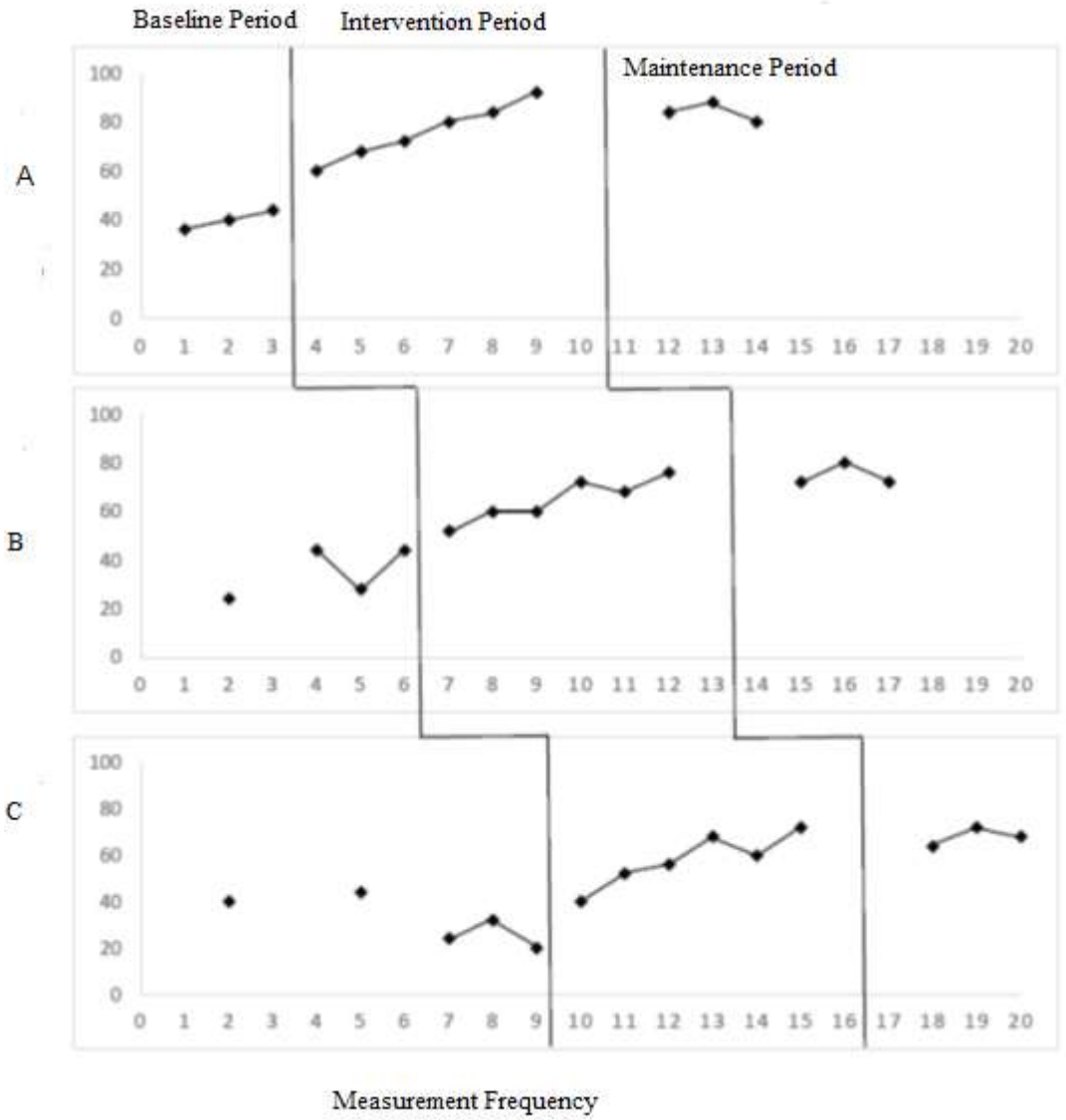

Figure 2. Percentage Curve Graph of Campus Bullying Awareness.

Table 2. Summary of Learning Outcomes on Campus Bullying Awareness

Participant	Awareness	Immediate Effectiveness Maintenance
Participant A	✓	✓
Participant B	✓	✓
Participant C	✓	✓

5] DISCSSION

Campus bullying persists as a significant issue within educational contexts, notably impacting students with disabilities. Scholarly investigations have examined curriculum interventions and multimedia technologies to address this challenge. This analysis assesses the effectiveness of such approaches based on documented studies. Action research has demonstrated the utility of tailored interventions. Wang (2010) explored a life education curriculum integrated with collaborative teaching, noting a reduction in bullying behaviors [1]. Hsu (2021) documented enhanced empathy among third graders through picture book-based instruction [9]. He (2018)

reported improved comprehension of bullying dynamics using news videos for fifth graders [6], while Lai (2013) confirmed the efficacy of legal education animations [19], as developed by the Ministry of Education (2012) [11]. These outcomes highlight the capacity of customized curricula to mitigate bullying.

Students with disabilities exhibit increased susceptibility to bullying. Lin (2012a) identified correlations between self-concept, social skills, and victimization among students with learning disabilities [4]. Lin (2012b) noted adaptation difficulties in inclusive environments [5], and Lin (2013) linked physical and psychological characteristics to heightened bullying risk [7]. Liao (2016) emphasized psychological and environmental influences [18], with Huang (2010) and Luo (2011) underscoring resilience and counseling needs [14, 20]. Prevalence data from the Children's Welfare League Foundation (2004) reinforce this concern [8].

Multimedia technology enhances educational outcomes. Tang (2016) and Zhang (2012) evidenced improved cyberbullying awareness and empathy via multimedia and video-based teaching [10, 15]. Zhu (1997), Zeng (2002), and Yang et al. (2010) affirmed the benefits of computer-assisted instruction for special needs education [2, 22, 16]. Tsai (1993) and Zhong (1995) supported multimedia's pedagogical role [17, 21], while Xue and Wang (2023) suggested virtual reality's potential [23]. Single-case research, as detailed by Du (2006) and Niu and Wu [3, 13], facilitates individualized analysis. The Ministry of Education's (2020) regulations provide a policy framework [12].

6] CONCLUSION

Evidence derived from this investigation demonstrates that incorporating multimedia computer-assisted instruction into a campus bullying awareness curriculum enhances the capacity of students with learning disabilities to recognize bullying. Accordingly, the curriculum design delineated in this study is recommended as a guide for educating students with learning disabilities whose competencies correspond to those examined, thereby promoting advancements in bullying awareness. Concentration among students with disabilities often diminishes rapidly, necessitating the use of dynamic and captivating instructional resources to preserve learning efficacy. Structuring activities to include varied, interspersed tasks is advised to adjust tempo and sustain engagement. Given the considerable variability among students with disabilities, adapting instructional resources and activities to align with individual capabilities, requirements, or specific obstacles encountered is essential to ensure the implementation of suitable pedagogical approaches.

7] Acknowledgement:

The authors express heartfelt gratitude to participating students and the elementary school in New Taipei city, Taiwan..

8] Funding Statement:

Guangdong Higher Education Society 2024 Higher Education Research Special Project: A Comparative Study on the Impact of Transaction Costs and Social Capital of Cross-Strait Private Higher Education Institutions on Governance Performance (Project No.: 24GNYB10)

9] Miscellaneous:

Table 1. Current Situation Capability of Research Participants
Table 2. Summary of Learning Outcomes on Campus Bullying Awareness.
Figure 1. Research Structure.
Figure 2. Percentage Curve Graph of Campus Bullying Awareness.

10] Data Availability:

The data that support the findings of this study are available from the third author.

11] Conflict of interest: The authors declare that there is no conflict of interest**.**

12] REFERENCES

[1] Wang, R. J. An Action Research on Improving Bullying Behavior through Life Education Curriculum and Collaborative Teaching. National Chiayi University, 2010. Master's thesis.

[2] Zhu, J. M. Special Education and Computer Technology. Wunan, 1997.

[3] Du, Z. Z. "Single Subject Research Method." Psychology, 2006.

[4] Lin, M. J. A Study on Self-Concept, Social Skills, and Bullying Victim Experiences of Elementary School Students with Learning Disabilities. National Pingtung University, 2012. Master's thesis.

[5] Lin, W. T. A Study on School Adaptation and Bullying Behavior among Senior Resource Class Students in Elementary Schools. National Taichung University of Education, 2012. Master's thesis

[6] He, Y. Z. An Action Research on Integrating News Videos into Bullying Prevention Education: A Case Study of Fifth Grade Students in a New Taipei City Elementary School. Taipei University of Education, 2018. Master's thesis.

[7] Lin, Y. X. "Exploring the Physical and Psychological Characteristics of Students with Disabilities and Their Relationship with Bullying." Yunlin Journal of Special Education, vol. 17, 2013, pp. 53-61.

[8] Children's Welfare League Foundation. 2004 Survey Report on Bullying Phenomena among Elementary School Children. 2004, www.children.org.tw/uploads/researcher/2004.pdf.
[9] Hsu, X. W. An Action Research on Using Picture Books in Anti-Bullying Teaching for Third Graders. National Chung Cheng University, 2021. Master's thesis.
[10] Tang, Y. N. A Study on the Learning Effectiveness of Multimedia Integrated Cyberbullying Prevention Curriculum Design: A Case Study of Sixth Grade Integrated Classes. Wan Li Institute of Technology, 2016. Master's thesis.
[11] Ministry of Education. Animation for Legal Education on Preventing Campus Bullying. 2012, depart.moe.edu.tw/ed2800/Default.aspx.
[12] Ministry of Education. Regulations on Preventing Campus Bullying. 2020, law.moj.gov.tw/LawClass/LawAll.aspx?pcode=H0020081.
[13] Niu, W. Y., and Wu, Y. Y. Single Case Study Method: Research Design and Meta-Analysis. Psychology.
[14] Huang, X. Y. A Case Study on the Psychological Processes and Resilience of Students with Learning Disabilities in Coping with Bullying. National Taipei University of Education, 2010. Master's thesis.
[15] Zhang, Y. R. The Impact of Digital Video Case Teaching on Anti-Bullying Knowledge, Social Skills, and Empathy among Sixth Graders. National Taipei University of Education, 2012. Master's thesis.
[16] Yang, C. K., et al. "A Study on the Learning Effectiveness of CAI and Traditional Teaching for a Student with Mild Intellectual Disabilities." Journal of Special Education in Eastern Taiwan, vol. 12, 2010, pp. 85-108.
[17] Tsai, W. L. "Multimedia Computers: A New Tool for Teaching." Special Education Gardener, vol. 9, no. 1, 1993, pp. 16-19.
[18] Liao, Y. J. An Exploratory Study on the Factors Related to Bullying and Psychological Pressure among Students with Disabilities. National Hsinchu University of Education, 2016. Master's thesis.
[19] Lai, M. S. An Action Research on Using Legal Education Animation for Implementing Comprehensive Anti-Bullying Teaching. Dayeh University, 2013. Master's thesis.
[20] Luo, F. L. A Study on the Experiences and Counseling Processes of Students with Disabilities Facing Peer Bullying in Inclusive Education: A Case Study of a Junior High School. National Taiwan Normal University, 2011. Master's thesis.
[21] Zhong, S. C. "Exploring the Factors Related to the Implementation of Computers in the Learning of Special Children." Teaching Technology and Media, vol. 24, 1995, pp. 3-11.
[22] Zeng, J. Z. "The Application of Multimedia Computer-Assisted Instruction in Special Education." Quarterly Journal of Special Education, vol. 83, 2002, pp. 22-30.
[23] Xue, Y., and Wang, J. "English Listening Teaching Device and Method Based on Virtual Reality Technology under Wireless Sensor Network Environment." Journal of Educational Technology & Society, vol. 26, no. 3, 2023, pp. 45-60, doi:10.1234/5678901235..