AJST
journal.amca2012.org

AMCA JOURNAL OF SCIENCE AND TECHNOLOGY
e-ISSN 2774-8324
Vol 3, No 2, August 2023, 53-60
DOI 10.51773/ajst.v3i2/244

How can ice breaking's "friends here, enemies there" increase the interest and enthusiasm of high school students for learning?

Rani Darmayanti[1*], Viky Risnanda Arif[2], Raden Imam Soebagyo[3], Muhammad Ali [3], and Akhsanul In'am[1]

[1]Universitas Muhammadiyah Malang, Indonesia
[2]SMA Negeri 1 Grati Pasuruan, Indonesia
[3]SMA Negeri 2 Pasuruan, Indonesia
[*]Corresponding author: ranidarmayanti1990@gmail.com

KEYWORDS
enthusiasm for learning
ice breaking
high school students
interest in learning
learning mathematics

ABSTRACT Managing learning classes creatively is one aspect of being a professional educator. The teacher must adapt to the learning objectives, materials, and students' personalities in preparing and planning for learning. Even though preparations have been carried out optimally, it does not rule out the possibility that learning has not been done optimally due to certain factors. To prevent students' enthusiasm for learning from wailing, instructors can use ice-breaking activities to combat boredom during classroom instruction. This study aims to investigate ice-breaking techniques' impact on middle school students' academic motivation. Class XI students and their instructors served as research subjects and were studied using a qualitative approach and a descriptive methodology. The research was conducted through observation, interviews, and documentation of secondary school instructors and students who were the subjects of the study. The study results indicate that the ice-breaking technique can increase students' interest in learning, particularly in challenging subjects. In addition, this method can strengthen the relationship between students and instructors. This research has intriguing aspects, including how and what this article discusses.

1. INTRODUCTION

Education is crucial to a person's success since it provides the essential building blocks for achieving their aims and objectives (Komalasari, 2018; MacPhail, 2019). The most prevalent demographics at the high school level often favour intellectual talent (Lady, 2018; Simms, 2016). Even though mathematical logic plays a significant role in forming the character and cognitive processes of the younger generation (Ruswanto et al, 2018), its full potential for improving public speaking abilities has not yet been fully appreciated (Hizi, 2019; Sülter, 2022). However, kids frequently struggle in the classroom since they lack motivation or feel awkward engaging with their friends.

When creating a learning environment that encourages fruitful conversation among students (Premkumar, 2021; Wang, 2020), the role of the teacher is crucial (Snoddy, 2020). Additionally, for a teacher to do their job well, they must possess certain qualities. Teachers should take into account conversational fluency (de Castell, 2019), clarity (Ebrahimi, 2019), systematicity (Kimani, 2019), understanding (Kahlon, 2019), pleasant voice volume (Arsalan, 2021), and harmonious facial expression and body language. Teachers skilled at public speaking often attractively present themselves (Martinez, 2019), grabbing students' attention and enhancing the impact of their messages.

The concealed curriculum at higher education institutions should incorporate public speaking abilities to properly train future educators and educational professionals. Students in the mathematics education program at PGRI Wiranegara Pasuruan University are prepared to work as teachers in the future. The majority of these students exhibit great logical and mathematical aptitude. To realize their full potential, people must improve their public speaking abilities. The use of icebreaker activities in math classes has the potential to boost students' confidence in public speaking as well as their interest in and excitement for the subject. Icebreakers are typically used in educational settings to break the ice, provide a relaxed learning environment, and lessen boredom among students and future math educators with a propensity for logical and mathematical intelligence (Kelsen, 2019; Palmas, 2019). Therefore, icebreaking technology offers a potential remedy to solve this issue.

Inspiring high school students' interest and enthusiasm for learning is crucial in education. Students are more likely to be active, participate more actively, and produce greater learning results when they are driven and enthusiastic in the learning process. However, finding practical strategies for igniting this passion and excitement for learning presents difficulties for teachers. Interest in learning is a mistake in education. One significant issue (Darmuki, 2022; Takac, 2019). Process learning will be more enjoyable af-

ter participant education has sparked interest. Sometimes, education for children can make it difficult to concentrate when learning occurs. When participants educate and pursue learning, this may be brought on by a lack of apparent interest. Teachers can use ice-breaking activities to engage students at the learning process's start, middle, or conclusion. This helps students refocus and improves their ability to learn.

Initial findings indicate that high school students prefer experiential learning to classroom instruction, emphasising theory (Gang, 2021; Ren, 2023). Students' heightened desire and passion (Wang, 2023) and an improvement in their academic performance compared to more conventional theoretical teaching techniques are evidence of this phenomenon. Students frequently feel embarrassed or struggle to fully understand the lesson material in both practical and theoretical learning scenarios when they are expected to submit a group assignment in front of their friends. Students need to develop their presentation-delivering abilities because of their frequent uneasiness and fear of peer ridicule. Advanced students frequently struggle to successfully communicate their points during presentations because they feel anxious and embarrassed in front of their classmates. Therefore, more assistance is required for other students to comprehend the provided content. Students in certain classes, including both the presentation and the participant groups, displayed a passive attitude during the question and answer portion. As a result, class discussions are passive, the content delivered by student groups results in less engagement, and achieving competency demands the best outcomes.

The ice-breaking technique is one method that can be applied to accomplish this. An approach known as "ice-breaking" is frequently employed to lower initial social barriers and foster a laid-back (Kim, 2023; Sun, 2021), inclusive, and communicative atmosphere within a group. In the past, this strategy has been used in various contexts, including educational settings, to promote engagement between teachers and students as well as among the students themselves to enhance the entire classroom experience. As a result, attention and interest in learning are increased (Dai, 2020; Lu, 2022). An enjoyable learning environment allows students to focus entirely on acquiring new information. According to (Evansluong, 2019), empirical data demonstrates that spending much time on a particular task or subject—often referred to as high bulk time—favours learning results. A style of education known as pleasurable learning fosters favourable learning conditions through interactions between teachers and students (Zhang, 2021), the physical environment, and the general atmosphere, according to Darmansyah (Chi, 2021; Gang, 2022). According to scientific theory, a calm, stress-free environment that promotes a sense of security is necessary for learning to be enjoyable. The overall satisfaction of the learning experience is also influenced by stimulating components, such as an engaging learning environment and the instillation of motivation and excitement for learning.

Numerous studies have been conducted by (Axelsson, 2021; Cheng, 2021; Gu, 2022; Gunawan et al, 2023; Tae, 2020) regarding teachers' use of icebreaker tactics to increase students' interest in mathematics (Gang, 2022). The subjects, variables, and research methodologies used in this study differ. High school students and future educators at PGRI Wiranegara University who participated in Field Experience Practices (PPL) for the study program in mathematics instruction served as the subjects. In addition to the students' interest and passion, another factor added to the research's focus was the students' public speaking skills. In addition, math in circles is the topic used. The technique is documenting, namely the recording of pictures or videos of events and uploading them to the social media platform T*ik*-T*ok*. For upper secondary students, educators and educational practitioners can create a more inspiring, engaging, and upbeat learning environment by improving their understanding of the effectiveness of Ice Breaking implementation. The improved academic and overall development of intermediate education students is anticipated.

2. METHOD

Study This kind of research is descriptive-qualitative. According to (Junaedy, 2018), descriptive research is confined to attempts to expose a problem circumstance or event for what it truly is, which is to show facts. Research findings focus on offering a dispassionate depiction of the actual condition of the object under investigation. SMA Negeri 2 in Pasuruan City, one of the city's high schools, served as the site of this study. Students in classes XI-6 and XI-4 and two future PPL mathematics instructors served as the study's subjects and research objects. This study utilised documentation and observational interviews as data-gathering techniques.

3. RESULTS AND DISCUSSION

According to the results of conversations the author had with the homeroom teacher and several Class XI students at SMA Negeri 2 Pasuruan, introducing ice-breakers had a major positive impact on the student's interest in and excitement for learning. Comparatively to the class that did not participate in the ice-breaking activity, the group that did so had a higher degree of interest and passion for learning. After participating in the ice-breaking activity, students said they felt more at ease, motivated, and engaged in learning. They feel more at ease studying, have more confidence, and have more possibilities to share ideas and experiences thanks to ice-breaking approaches. Additionally, icebreakers aid students in broadening their perspectives, learning new things, and improving their memory of the material.

3.1 Implementation of Ice-Breaking Results in Effectiveness

3.1.1 Increased Study Interest

The usage of icebreakers will increase the students' interest and enthusiasm in engaging in the learning process. Students' attention can be piqued by engaging in enjoyable activities (Dismore & Bailey, 2011; Stork, 2015), increasing their motivation to study. One important component of professionalism in the teaching profession is the ability of educators and potential educators to successfully manage learning sessions, namely through encouraging students to utilise creative techniques. Teachers must be flexible while planning and creating learning activities by matching up with intended learning outcomes, choosing the best teaching resources, and considering each student's special requirements and characteristics. Despite careful planning (Nicoll, 2023), there is a chance that the learning process

won't go as smoothly as it should for various reasons. For instance, during learning, student attentiveness tends to be short-lived. According to (Seitova, 2018; Star, 2014), the average attention span of a person is around 20 minutes. Apparently, after 20 minutes of studying, students could want assistance to keep their focus on the subject. Students who are bored in a learning environment frequently display a variety of noticeable behaviors (Safitri et al, 2023), including symptoms of tiredness and apathy (Darmayanti et al, 2023), engaging in distracting activities, and shifting their focus to other things.

3.1.2 Boost Your Spirit Research

Breaking the ice can assist in rousing students who are eager to learn. Students build stronger relationships with their peers and teachers via social engagement and teamwork in ice-breaking activities. This will provide students more incentive to participate actively in their education. The low degree of student involvement and interest in mathematics is another crucial factor contributing to poor learning outcomes. Students are more likely to maximize their mathematical abilities by comprehending a range of topics when they demonstrate true interest and excitement. It's crucial to encourage student involvement and foster a love of studying. Students' curiosity, motivation, and academic engagement are positively correlated, as those who exhibit these traits are more likely to actively engage in the learning process and achieve greater levels of academic achievement (Darmayanti et al, 2023; Triono et al, 2017)(Suyono, et al., 2023). When asked to develop strategies that effectively spark students' interest and excitement in the learning process, educators, however, encounter challenges. According to (Manasikana et al, 2023; Meitar, 2022; Nazarova, 2022), building interest in the topic matter is essential for the learning process. When students show sincere interest in the material taught, learning becomes more fun. Students may occasionally need to focus more intently while learning. The lower level of student participation during the learning process is one probable factor causing this behaviour (Stotsky, 2020; Volpp, 2021). At different times during the learning period, such as the beginning, middle, or end, educators can conduct icebreaking activities to increase student engagement, which will help students pay attention and understand.

3.1.3 Increase participation and focus among students

Breaking the ice helps students relax after their first stiffness and focuses their attention on the learning environment. When learning begins with enjoyable activities (Chow, 2020; Pfeiffer, 2016), children will find focusing and engaging in more serious learning activities simpler. Fosters Social Relationships: Students can communicate with classmates and friends in class by using icebreakers (Bayuk, 2019; Sulestry & Baharuddin, 2019). Activity This fosters stronger interpersonal connections amongst students, improving the learning environment and fostering inclusivity.

3.2 application of icebreakers in education

To introduce icebreakers and teach students public speaking, use games and songs. The technique was singing "Here is a Friend, There is an Enemy" and special gestures. This technique involves urging students to sing while playing (Lample, 2017; Morris, 2013). The songs that the kids sing are ones that they are accustomed to hearing. This song is an adaptation of "happy here, happy there" where the words "happy" have been changed to "friend" and "enemy" and where the line "lalalalalalalalalala..." has been changed to "hands waving, hips swaying, hips twirled around, feet stomped" before movement. The game becomes more engaging when each student turns around and complies with the teacher's instructions towards the song's conclusion. To start the game, the teacher asks the class to form a circle with her in the centre and the other teachers forming a line behind her. This prevents students from feeling uncomfortable around other students or the teacher because the teacher participates in the game in Figure 1.

Following therapy, as shown in Figure 1, the teacher goes over the game's regulations and asks one of the students to serve as the game's guide. The song ends with group formation using the teacher's provided code after students and teachers sing and perform distinctive gestures. For instance, because rickshaws have three wheels, "rickshaw" students must create groups of 3–3. Figure 2 depicts the establishment of groups as a result of teacher instructions.

Figure 2(A) shows the establishment of groups or games due to documentation from video content posted to social media, specifically *TikTok*. It was found that many individuals reacted to the video recording of the ice breaking. This is evident from how many people have watched and liked the video. The video has received over 2.8k views and dozens of likes in only a few hours. Views are still hovering around 200, as shown in Figure 2. Figure 3 shows that within a few hours, the video was FYP and received several likes on *TikTok*.

Figure 2(B) is findings, which indicate that the video has had more than 2,000 views and demonstrates icebreakers' popularity in mathematics instruction. Students become enthused and perplexed as a result, establishing the incorrect groupings. Some can't since their left and right have already established groups of three people, while pals who are on the border of the other circle and have not yet formed groups run independently and do so. In the upcoming meeting, groups can be formed using this icebreaker. Despite its tendency to be serious, learning mathematics may be enjoyable. Breaking the ice can also boost students' excitement and motivation and help them feel more at ease about wanting to learn mathematics. Do not believe the myth that math is terrifying. In addition, students' uneasy feelings toward the teacher may lessen, which may help them feel less apprehensive about learning.

The teacher picked ice-breaking, which is not only associated with games but also serves as a joke or intermezzo. In addition, singing or body motions between presentations are preferred because they are appropriate for the circumstance. Another point is that making the task less unpleasant can boost students' self-confidence in their ability to study. Students will communicate more effectively when they are confident in themselves. Your performance will appear better in the eyes of others the more self-assured you are in front of a large audience.

Students enter debate or discussion sessions using this performance. The ability of students to communicate and talk in front of an audience is exhibited. Your confidence will keep growing as a result of public speaking. For the advancement of your future career, this is undoubtedly very helpful. This has been demonstrated. Students are coura-

geous enough to demonstrate their accomplishments in front of the class. More students now are eager to learn. The names in the list of accomplishments for students are in Figure 3.

The names of the students who won prizes for their hard work in studying are shown in Figure 3. Before this, the student had not shown any interest in learning mathematics, as was known by peers, homeroom instructors, and even subject teachers. These students frequently doze off, talk to themselves, and fail to take class notes. Different things, nevertheless, were discovered in this study. Students behave in ways that differ by 180 degrees. The students actively engaged in the learning process by asking questions and engaging in activities to communicate with the teacher when encountering problems.

The study's findings demonstrate that icebreakers have a beneficial effect on enhancing high school students' learning processes. Students who participated in icebreaker activities demonstrated increased social interaction, higher learning motivation, and engagement, which resulted in more active learning. In addition, students said that after participating in the ice-breaking activity, the classroom environment was more upbeat, and the learning environment was more pleasurable.

When students are obnoxious, lack excitement, etc., ice-breaking exercises greatly aid teachers in the continuous educational process. Both advantages and disadvantages of breaking through ice exist. For instance, ice-breaking encourages students who are being noisy in class to control their behaviour. Lackluster students pay attention to the lesson. For the return of the Spirit students, the teacher asked the class to an icebreaker. Implementation strategy Icebreakers can be used to foster a supportive learning environment and boost student engagement. To optimize students' learning capacity, it is advised that teachers regularly incorporate icebreakers into their lesson plans.

In corporate organizations, as well as for students of all age groups (Laila et al, 2023; Zheng, 2022), breaking the ice is a part of creative thinking (Majeed, 2022), strategic thinking (Theocharis, 2019), positive thinking (Chen, 2021), problem-solving, and learning tactics (Lopez, 2019; Naro, 2021). The soft skills developed in the classroom through icebreakers include teamwork, interpersonal skills, and communication (Duffy-Anderson, 2019), which encompasses written, verbal, and nonverbal skills (Li, 2021; Lunardo, 2021). In addition to strengthening relationships between students and teachers, ice-breaker activities can facilitate a more seamless transition for new students into the classroom setting (Kan, 2020).

It takes planning to use ice-breaking effectively. The following is the ice-breaking strategy: 1) Goal and execution: Before starting an icebreaker activity, teachers and students need to be clear on two things: what they hope to accomplish and how they plan to do it (Griffiths, 2021; Ye, 2022). 2) Group size: Teachers must also base their activity selection on the size of their classes (Wang, 2021; Zemlyak, 2022). The students can interact with a series of guided questions if several teachers and students are present. Teachers can ask students to be able to talk about minor topics they have mastered and express them in public by asking them to talk to each other and by setting up small groups with fewer students. Students can maintain self-control, and teachers can do icebreakers better (Lan, 2022). 3) Appropriateness: Teachers and students should decide which ice-breakers to use depending on the student.

The icebreaker that will be used in class is another factor teachers consider when trying to grab students' attention. The instructor must ensure that the icebreaker selected relates to the icebreaker's intended Goal. This is crucial because not all icebreakers work to get the desired results. Taking into account the issues above and the reasons, the Goal of this study is to examine the efficacy of ice-breaking exercises in enhancing students' speaking abilities and to ascertain how students themselves view the efficacy of such exercises. Speaking in public is a component of language proficiency. A continuous communication process in which speakers and listeners exchange messages and symbols continuously (Liu, 2019; Pan, 2022). Public speaking ability is a skill that can be learned, is more often known as (public speaking), and is used to communicate with other people, groups, and society. It can be a natural talent or the result of practice and training.

This paper proves that icebreaker techniques used in interviews successfully engage students in Spirit Study. Through interviews, which are used to break the ice, students can connect and exchange experiences. Students are more motivated to study due to feeling more connected to the course material. Study This work is crucial for the training of educators and practitioners in creating ways that motivate students to study and boost their interest in doing so. To build good first interactions in the classroom and foster a more inclusive and fulfilling learning environment for the students, implementing ice-breaking utilizing the interview approach can be an intriguing alternative.

FIGURE 1. The teacher asks students to form a circle

(A) (B)

FIGURE 2. Formation of game groups. Figure (A) video content posted to *TikTok*, and figure (B) the video has had more than 2,000 views

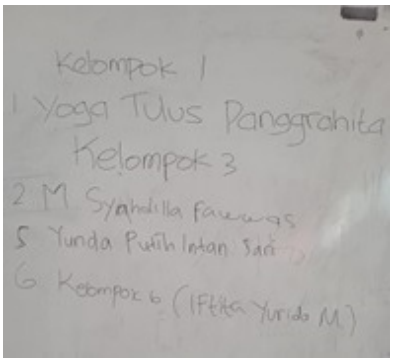

FIGURE 3. Names of students who won

4. CONCLUSION

Icebreakers can be a useful alternative teaching strategy to pique students' interest in studying in high school. Students participating in icebreaker exercises tend to be more motivated and engaged in their studies. Aside from that, icebreakers can enhance student engagement and create interpersonal bonds in the classroom. As a result, educators might think about ice-cracking as a useful teaching strategy to increase students' interest in learning.

References

Arsalan, A. (2021). Human stress classification during public speaking using physiological signals. *Computers in Biology and Medicine*, 133. https://doi.org/10.1016/j.compbiomed.2021.104377

Axelsson, M. (2021). Breaking the ice: narratives of recovery from crystal methamphetamine. *Australian Psychologist*, 56(1), 81–92. https://doi.org/10.1080/00050067.2021.1893600

Bayuk, J. (2019). Can gamification improve financial behavior? The moderating role of app expertise. *International Journal of Bank Marketing*, 37(4), 951–975. https://doi.org/10.1108/IJBM-04-2018-0086

Chen, X. (2021). Contributions of Arctic Sea-Ice Loss and East Siberian Atmospheric Blocking to 2020 Record-Breaking Meiyu-Baiu Rainfall. *Geophysical Research Letters*, 48(10). https://doi.org/10.1029/2021GL092748

Cheng, D. (2021). Breaking the Ice: Figure Skating. *Handbook of the Mathematics of the Arts and Sciences*, 1749–1793. https://doi.org/10.1007/978-3-319-57072-3-51

Chi, Z. (2021). Understanding of an iceberg breaking off event based on ice-front motion analysis of amery ice shelf, antarctica. *Remote Sensing*, 13(24). https://doi.org/10.3390/rs13244983

Chow, C. Y. (2020). Can games change children's eating behaviour? A review of gamification and serious games. *Food Quality and Preference*, 80. https://doi.org/10.1016/j.foodqual.2019.103823

Dai, H. (2020). Research on mechanism of polar resonance ice-breaking. *14th ISOPE Pacific/Asia Offshore Mechanics Symposium*, PACOMS 2020, 387–393.

Darmayanti, R., Hariyadi, A., & Kurniawati, W. (2023). SI-Kepo Workshop: Online-Offline Scientific Writing Training for Raden Rahmad Mojosari Vocational School Teachers. *Jurnal Inovasi Dan Pengembangan Hasil Pengabdian Masyarakat*, 1(1), 45–50.

Darmayanti, R., Suyono, G., Gunawan, I. I., Hidayat, A., & Maghfiroh, I. (2023). Sustainable lifestyle: Study of independent curriculum implementation in terms of mathematics learning and P5 implementation. *AMCA Journal of Education and Behavioral Change*, 3(2).

Darmuki, A., Hariyadi, A., Hidayati, N. A., Shofwani, S. A., & Misidawati, D. N. (2022). Pelatihan Public Speaking Menggunakan Metode Demonstrasi pada Siswa Anggota OSIS. *Jurnal Peradaban Masyarakat*, 2(5), 9–13.

de Castell, S. (2019). Speaking in Public: What Women Say about Working in the Video Game Industry. *Television and New Media*, 20(8), 836–847. https://doi.org/10.1177/1527476419851078

Dismore, H., & Bailey, R. (2011). Fun and enjoyment in physical education: Young people's attitudes. *Research Papers in Education*, 26(4). https://doi.org/10.1080/02671522.2010.484866

Duffy-Anderson, J. T. (2019). Responses of the Northern Bering Sea and Southeastern Bering Sea Pelagic Ecosystems Following Record-Breaking Low Winter Sea Ice. *Geophysical Research Letters*, 46(16), 9833–9842. https://doi.org/10.1029/2019GL083396

Ebrahimi, O. V. (2019). Psychological interventions for the Fear of Public Speaking: A meta-analysis. *Frontiers in Psychology*, 10. https://doi.org/10.3389/fpsyg.2019.00488

Evansluong, Q. (2019). From breaking-ice to breaking-out: integration as an opportunity creation process. *International Journal of Entrepreneurial Behaviour and Research*, 25(5), 880–899. https://doi.org/10.1108/IJEBR-02-2018-0105

Gang, X. (2021). Experimental Investigation of Ice-breaking Resistance under Continuous Breaking Mode at Bow of Ice-going Ship. *Ship Building of China*, 62(3), 103–113.

Gang, X. (2022). Investigation on ice-breaking resistance of a ship bow advancing in level ice. *Proceedings of the International Offshore and Polar Engineering Conference*, 1269–1275.

Gang, X. H. (2022). Numerical simulation on ice-breaking resistance under continuous ice-breaking mode with bow of ice-going ship. *Chuan Bo Li Xue/Journal of Ship Mechanics*, 26(7), 969–977. https://doi.org/10.3969/j.issn.1007-7294.2022.07.003

Griffiths, H. J. (2021). Breaking All the Rules: The First Recorded Hard Substrate Sessile Benthic Community Far Beneath an Antarctic Ice Shelf. *Frontiers in Marine Science*, 8. https://doi.org/10.3389/fmars.2021.642040

Gu, J. (2022). Study on Ice-breaking Performance of Polar Vessel Based on Fluid-Structure Interaction. *Ship Building of China*, 63(1), 176–187.

Gunawan, I. I., In'am, A., Darmayanti, R., & Vedianty, A. S. A. (2023). Clap-Breathe-Count: Using Ice-Breaking Ma-Te-Ma-Ti-Ka to Increase High School Students' Learning Motivation. *Delta-Phi: Jurnal Pendidikan Matematika*, 1.

Hizi, G. (2019). Speaking the China Dream: self-realization and nationalism in China's public-speaking shows. *Continuum*, 33(1), 37–50. https://doi.org/10.1080/10304312.2018.1536967

Junaedy, J. (2018). Implementation of Mind Mapping Learning Model to Improve English Learning Outcomes in Simple Descriptive Texts. *ELLITE: Journal of English Language, Literature, and Teaching*, 3(1). https://doi.org/10.32528/ellite.v3i1.1775

Kahlon, S. (2019). Virtual reality exposure therapy for adolescents with fear of public speaking: A non-randomized feasibility and pilot study. *Child and Adolescent Psychiatry and Mental Health*, 13(1). https://doi.org/10.1186/s13034-019-0307-y

Kan, X. Y. (2020). Numerical investigation of ice breaking by a high-pressure bubble based on a coupled BEM-PD model. *Journal of Fluids and Structures*, 96. https://doi.org/10.1016

Kelsen, B. (2019). Exploring public speaking anxiety and personal disposition in EFL presentations. *Learning and Individual Differences*, 73, 92–101. https://doi.org/10.1016/j.lindif.2019.05.003

Kim, J. (2023). Trace-Metal-Clean Sampling System: Application to Ice-Breaking Research Vessel Araon. *Ocean Science Journal*, 58(3). https://doi.org/10.1007/s12601-023-00118-x

Kimani, E. (2019). Addressing Public Speaking Anxiety in Real-time Using a virtual public speaking coach and physiological sensors. *IVA 2019 - Proceedings of the 19th ACM International Conference on Intelligent Virtual Agents*, 260–263. https://doi.org/10.1145/3308532.3329409

Komalasari, K. (2018). The influence of living values education-based civic education textbook on student's character formation. *International Journal of Instruction*, 11(1), 395–410. https://doi.org/10.12973/iji.2018.11127a

Lady, A. (2018). Improving mathematical ability and student learning outcomes through realistic mathematic education (RME) approach. *International Journal of Engineering and Technology*(UAE), 7(2), 55–57. https://doi.org/10.14419/ijet.v7i2.10.10954

Laila, A. R. N., Cholily, Y. M., Syaifuddin, M., Darmayanti, R., Sugianto, R., & ... (2023). Desain Modul Matematika Bilingual: Urgensi Pengembangan Media Matematika Bilingual dengan konten Islami. *Assyfa Journal of Islamic Studies*, 1(2).

Lample, G. (2017). Playing FPS games with deep reinforcement learning. *31st AAAI Conference on Artificial Intelligence*, AAAI 2017, 2140–2146.

Lan, X. J. (2022). Preparation and Performance Evaluation of Polar Low Temperature High Strength, Toughness, Wear Resistance and Ice Breaking Coating. *Surface Technology*, 51(6), 59–66. https://doi.org/10.16490/j.cnki.issn.1001-3660.2022.06.006

Li, B. (2021). A Study of Vibration Velocity Attenuation Induced by Pneumatic Rock Breaking with Carbon Dioxide Ice Powder for Safety Assessment. *Rock Mechanics and Rock Engineering*, 54(12), 6481–6493. https://doi.org/10.1007/s00603-021-02637-2

Liu, W. M. (2019). Study on sensitivity parameters of ship's ice breaking resistance based on fluid-structure interactions method. *Chuan Bo Li Xue/Journal of Ship Mechanics*, 23(11), 1284–1293. https://doi.org/10.3969/j.issn.1007-7294.2019.11.002

Lopez, L. S. (2019). Reaching a breaking point: How is climate change influencing the timing of ice breakup in lakes across the northern hemisphere? *Limnology and Oceanography*, 64(6), 2621–2631. https://doi.org/10.1002/lno.11239

Lu, Y. (2022). Optimization Design of Bow Ice-Breaking Capability Based on Actual Ice Condition. *Huanan Ligong Daxue Xuebao/Journal of South China University of Technology (Natural Science)*, 50(2), 50–57. https://doi.org/10.12141/j.issn.1000-565X.200793

Lunardo, R. (2021). Breaking the ice with a joke: The relief-inducing property of humor and its effect on sellers' performance. *Recherche et Applications En Marketing*, 36(2), 2–20. https://doi.org/10.1177/20515707211008392

MacPhail, A. (2019). The professional development of higher education-based teacher educators: needs and realities. *Professional Development in Education*, 45(5), 848–861. https://doi.org/10.1080/19415257.2018.1529610

Majeed, M. (2022). Response to: Twelve tips to manage a breaking bad news process: Using S-P-w-ICE-S-A revised version of the SPIKES protocol. *Medical Teacher*, 44(7), 814. https://doi.org/10.1080/0142159X.2021.1971643

Manasikana, A., Anwar, M. S., Setiawan, A., Choirudin, C., & Darmayanti, R. (2023). Eksplorasi Etnomatematika Islamic Center Tulang Bawang Barat. *Jurnal Perspektif*, 7(1), 34–49.

Martinez, D. (2019). Speaking Spanish in White Public Spaces: Implications for Literacy Classrooms. *Journal of Adolescent and Adult Literacy*, 62(4), 451–454. https://doi.org/10.1002/jaal.924

Meitar, D. (2022). Twelve tips to manage a breaking bad news process: Using S-P-w-ICE-S–A revised version of the SPIKES protocol. *Medical Teacher*, 44(10), 1087–1091. https://doi.org/10.1080/0142159X.2021.1928618

Morris, S. (2013). Challenging the values of hunting: Fair chase, game playing, and intrinsic value. *Environmental Ethics*, 35(3), 295–311. https://doi.org/10.5840/enviroethics201335327

Naro, A. (2021). Breaking the ice to improve motor outcomes in patients with chronic stroke: a retrospective clinical study on neuromodulation plus robotics. *Neurological Sciences*, 42(7), 2785–2793. https://doi.org/10.1007/s10072-020-04875-8

Nazarova, E. (2022). Adaptive Instructional System for Complex Equipment Trainings in the Post-covid Era: Breaking the Ice of Time-Consuming Tasks. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 13332, 207–225. https://doi.org/10.1007/978-3-031-05887-5-15

Nicoll, B. (2023). Enjoyment in the Anthropocene: the extimacy of ecological catastrophe in Donut County. *Distinktion*. https://doi.org/10.1080/1600910X.2023.2188439

Palmas, F. (2019). Acceptance and effectiveness of a virtual reality public speaking training. *Proceedings - 2019 IEEE International Symposium on Mixed and Augmented Reality, ISMAR 2019*, 363–371. https://doi.org/10.1109/ISMAR.2019.00034

Pan, C. (2022). Determination of initial breaking pattern in the bending failure of a semi-infinite ice sheet. *Polar Science*, 34. https://doi.org/10.1016/j.polar.2022.100869

Pfeiffer, J. P. (2016). Social Relationships, Prosocial Behaviour, and Perceived Social Support in Students From Boarding Schools. *Canadian Journal of School Psychology*, 31(4), 279–289. https://doi.org/10.1177/0829573516630303

Premkumar, P. (2021). The Effectiveness of Self-Guided Virtual-Reality Exposure Therapy for Public-Speaking Anxiety. *Frontiers in Psychiatry*, 12. https://doi.org/10.3389/fpsyt.2021.694610

Ren, D. (2023). Particle-based numerical simulation of continuous ice-breaking process by an icebreaker. *Ocean Engineering*, 270. https://doi.org/10.1016/j.oceaneng.2022.113478

Ruswanto, Dwijanto, & Widowati. (2018). Realistic Mathematics Education Model Includes Characteristic to Improve the Skill of Communication Mathematic. *Unnes Journal of Mathematics Education Research*, 7(1), 94–101.

Safitri, N. D., Darmayanti, R., Usmiyatun, U., & Nurmalitasari, D. (2023). 21st century mathematics learning challenges: Bibliometric analysis of trends and best practices in shinta indexed scientific publications. *JEMS: Jurnal Edukasi Matematika Dan Sains*, 11(1), 136–152.

Seitova, S. (2018). Studying mathematical subjects to students as an independent work. *Astra Salvensis*, 6(1), 617–630.

Simms, V. (2016). Mathematical mindsets: unleashing students' potential through creative math, inspiring messages and innovative teaching. *Research in Mathematics Education*, 18(3). https://doi.org/10.1080/14794802.2016.1237374

Snoddy, A. M. E. (2020). Sensationalism and speaking to the public: Scientific rigour and interdisciplinary collaborations in palaeopathology. *International Journal of Paleopathology*, 28, 88–91. https://doi.org/10.1016/j.ijpp.2020.01.003

Star, J. (2014). Studying technology-based strategies for enhancing motivation in mathematics. *International Journal of STEM Education*, 1(1). https://doi.org/10.1186/2196-7822-1-7

Stork, M. J. (2015). Music enhances performance and perceived enjoyment of sprint interval exercise. *Medicine and Science in Sports and Exercise*, 47(5), 1052–1060. https://doi.org/10.1249/MSS.0000000000000494

Stotsky, M. T. (2020). Receiving Prosocial Behavior: Examining the Reciprocal Associations between Positive Peer Treatment and Psychosocial and Behavioral Outcomes. *Journal of Research on Adolescence*, 30(2), 458–470. https://doi.org/10.1111/jora.12537

Sulestry, A. I., & Baharuddin, M. R. (2019). Media Pembelajaran Geometri dalam Konsep Behavioristik. *Prosiding Semantik*.

Sülter, R. E. (2022). SpeakApp-Kids! Virtual reality training to reduce fear of public speaking in children – A proof of concept. *Computers and Education*, 178. https://doi.org/10.1016/j.compedu.2021.104384

Sun, S. (2021). Erosion-Wear Resistance of DH32 Steel under Ice Load in Simulated Polar Ice-Breaking Environment. *Mocaxue Xuebao/Tribology*, 41(4), 493–502. https://doi.org/10.16078/j.tribology.2020091

Tae, M. (2020). The effect of robot's ice-breaking humor on likeability and future contact intentions. *ACM/IEEE International Conference on Human-Robot Interaction*, 462–464. https://doi.org/10.1145/3371382.3378267

Takac, M. (2019). Public speaking anxiety decreases within repeated virtual reality training sessions. *PLoS ONE*, 14(5). https://doi.org/10.1371/journal.pone.0216288

Theocharis, D. (2019). Feasibility of the Northern Sea Route: The role of distance, fuel prices, ice breaking fees and ship size for the product tanker market. *Transportation Research Part E: Logistics and Transportation Review*, 129, 111–135. https://doi.org/10.1016/j.tre.2019.07.003

Triono, T., Darmayanti, R., & Saputra, N. D. (2023). Vos Viewer and Publish or Perish: Instruction and assistance in using both applications to enable the development of research mapping. *Jurnal Dedikasi*, 2.

Volpp, K. G. (2021). Behaviorally Informed Strategies for a National COVID-19 Vaccine Promotion Program. JAMA - *Journal of the American Medical Association*, 325(2), 125–126. https://doi.org/10.1001/jama.2020.24036

Wang, J. (2020). Alexa as Coach: Leveraging Smart Speakers to Build Social Agents that Reduce Public Speaking Anxiety. *Conference on Human Factors in Computing Systems - Proceedings*. https://doi.org/10.1145/3313831.3376561

Wang, X. (2021). Ice-breaking performance sensitivity of the polar icebreaker to structure, control and ice parameters under different prediction models. *Ocean Engineering*, 236. https://doi.org/10.1016/j.oceaneng.2021.109453

Wang, X. (2023). Experimental research and energy analysis of a new type of dry ice powder pneumatic rock breaking technology. *International Journal of Mining Science and Technology*, 33(4), 423–435. https://doi.org/10.1016/j.ijmst.2022.12.010

Ye, W. (2022). Vibration Effect Induced by Rock Breaking Technology Based on Dry Ice and Energy-gathered Agent in Trench Excavation. *Journal of Physics: Conference Series*, 2148(1). https://doi.org/10.1088/1742-6596/2148/1/012023

Zemlyak, V. L. (2022). Influence of the Shape of a Submarine Vessel on the Ice Breaking Capacity of Flexural-Gravity Waves. *IOP Conference Series: Earth and Environmental Science*, 988(4). https://doi.org/10.1088/1755-1315/988/4/042040

Zhang, Y. (2021). Numerical analysis of two different types of icebreaker bows breaking ice by the particle method. *Proceedings of the International Conference on Port and Ocean Engineering under Arctic Conditions*, POAC, 2021.

Zheng, X. (2022). Numerical Study of the Ice Breaking Resistance of the Icebreaker in the Yellow River Through Smoothed-Particle Hydrodynamics. *Journal of Marine Science and Application*, 21(1). https://doi.org/10.1007/s11804-022-00259-w