



Harnessing Suggestopedia: Multisensory Approaches for Language Learning and Environmental Literacy

Komal Ashok Raisinghani ^{a++}
and Bhupendra Nandlal Kesur ^{b#*}

^a KCE Society's M. J. College, Jalgaon, Maharashtra, India.

^b P. G. Department of English, KCE Society's M. J. College, Jalgaon, Maharashtra, India.

Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

Article Information

DOI: <https://doi.org/10.9734/arjass/2024/v22i10582>

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/124228>

Short Communication

Received: 22/07/2024

Accepted: 24/09/2024

Published: 26/09/2024

ABSTRACT

This paper reimagines Suggestopedia, an educational method developed by Georgi Lozanov, by integrating it with multisensory learning to advance both language acquisition and environmental education. Suggestopedia's core principle of creating a relaxed and emotionally supportive learning environment is combined with multisensory tools—such as music, visual storytelling, and interactive soundscapes—to foster a more engaging and effective approach to language learning. By embedding environmental themes into this model, the paper proposes a framework that allows students to simultaneously develop linguistic proficiency and ecological literacy. The study explores how multisensory engagement, including the use of comic strips and auditory stimuli, enhances

⁺⁺Research Scholar;

[#]Professor and Head;

^{*}Corresponding author: Email: bnkesur@gmail.com;

Cite as: Raisinghani, Komal Ashok, and Bhupendra Nandlal Kesur. 2024. "Harnessing Suggestopedia: Multisensory Approaches for Language Learning and Environmental Literacy". *Asian Research Journal of Arts & Social Sciences* 22 (10):26-34. <https://doi.org/10.9734/arjass/2024/v22i10582>.

students' emotional and cognitive connection to environmental issues while improving their language retention and comprehension. The theoretical framework emphasizes the importance of cognitive tranquillity and emotional engagement, showing how Suggestopedia's multisensory approach can deepen students' understanding of environmental challenges while reducing anxiety and fostering a more immersive learning experience. Through this interdisciplinary approach, the paper argues that students not only acquire language skills more effectively but also develop critical thinking and reflective abilities that equip them to address global environmental challenges. By bridging disciplines, this integrated approach not only equips students with the tools for academic success but also promotes responsible citizenship. The anticipated outcome is a more immersive and meaningful educational experience that prepares students to actively engage with both linguistic and environmental issues in real-world contexts.

Keywords: Multisensory learning; suggestopedia; environmental education; comic strips; cognitive tranquillity; language acquisition.

1. INTRODUCTION

In today's rapidly evolving world, education systems face the dual challenge of cultivating both academic proficiency and social responsibility among learners. Traditional methods, often reliant on rote memorization and text-heavy curricula, tend to focus on academic achievement without addressing the emotional and cognitive engagement necessary for deeper learning. This disconnection between memorization and application has been well-documented in educational research by Grove and Bretz, which states that "students simply attempt to memorize the newly acquired information without linking it to any previous knowledge and that is what causes the emergence of rote learning" [1]. This is in conjunction with what other researchers have found that "students have disconnected ideas; they are able to memorize definitions but cannot use them in context" [2]. As a result, many students find it difficult to retain knowledge or apply what they have learned in meaningful ways. In this context, educational methods that integrate emotional and cognitive development, such as Suggestopedia, offer promising solutions for addressing these modern educational challenges. Suggestopedia, developed by Georgi Lozanov in the 1970s, offers an innovative approach to language learning by creating a relaxed and supportive learning environment that enhances cognitive absorption through suggestion. "The method leverages music, art, and drama to enrich the learning experience, promoting faster language acquisition" [3]. Suggestopedia uses pseudo passiveness based on relaxation, creating an alert state of mind, with the antisuggestion barriers lowered, to increase the receptiveness of suggestions. This technique capitalizes on the natural state of receptiveness

and openness that occurs when the mind is calm and relaxed, allowing for more effective learning. Research indicates that "Suggestopedia significantly impacts learner confidence and motivation, facilitating greater engagement with the material" [4].

According to a study, "when a person was exposed to Suggestopedia, he was in the waking state and in a state of awareness, while attempting to reach the unknown reserves, powers, and abilities of the mind" [5,6]. This heightened state of awareness enables learners to access deeper cognitive and emotional resources, facilitating not only memory retention but also creative problem-solving and critical thinking. Suggestopedia could be used for all ages and levels of intelligence with increased learning speed and retention of material with little effort by the students. This universality makes Suggestopedia a versatile tool in diverse educational settings, from early childhood education to adult learning programs. Ostrander and Schroeder [5] reported that, "students tested a year later retained the material learned using Suggestopedia while showing an improvement in memory and intelligence." This long-term retention highlights the profound impact of this method on cognitive development, suggesting that the benefits extend beyond immediate learning outcomes. The student was alert and relaxed, possessing adequate motivation to increase memorization. This balance of alertness and relaxation creates an optimal learning environment where students can absorb information more effectively without the stress typically associated with traditional learning methods. According to a research, student-centered education may boost a student's self-esteem in ways that are connected to academic accomplishment [7]. The relaxed state fosters a

positive emotional climate, making students more receptive to both academic content and emotional insights. Positive emotions can initiate the cognitive process by increasing motivation and facilitating understanding by maintaining attention during learning [8]. According to Kroese, “One of Suggestopedia’s key contributions to learning is the creation of a cognitively calm environment, where students feel emotionally safe and engaged” [9]. This state of cognitive calmness is vital for students to fully engage with the material without the pressure or anxiety that often accompanies traditional learning methods. The calming environment nurtured by Suggestopedia helps students feel secure and reduces their mental barriers to learning, enabling them to absorb information at a deeper level. This principle is particularly useful in addressing emotionally charged subjects like environmental degradation and climate change, where students might feel overwhelmed by the magnitude of these issues. Positive reinforcement and suggestion are fundamental to Suggestopedia. Students are consistently exposed to affirming and encouraging messages, both verbally and through the learning materials. This positive reinforcement helps build self-esteem and self-worth, as students begin to see themselves as capable and competent learners. This is further enforced by a study in which, “when asked for the feedback students reported that they liked the technique and that they progressed more rapidly” [10,11,12,5].

2. SUGGESTOPEDIA AND THE ROLE OF COMIC STRIPS

At its core, Suggestopedia is designed to optimize learning by engaging multiple senses to create an immersive and holistic educational experience. This approach is particularly effective when applied to environmental education, where complex concepts—such as climate change, biodiversity loss, and sustainability—can benefit from being presented through visual, auditory, and kinesthetics’ modalities. As per a study, “Music can evoke emotional responses tied to nature, such as calmness or urgency, while art and visuals can represent environmental challenges in a way that resonates emotionally with students” [13]. For example, music can be used to evoke emotional responses connected to nature. A piece of music might simulate the calm of a forest, the chaos of a storm, or the urgency of environmental degradation, allowing students to experience the

emotional undertones of environmental themes. The multisensory techniques of Suggestopedia—such as the use of music, visuals, and positive suggestion—can help students connect emotionally with environmental issues while simultaneously developing their language skills. “The concept of multisensory learning involves engaging multiple sensory modalities—sight, sound, touch, taste, and smell—to enhance educational experiences” [14]. When applied to language education, multisensory techniques can improve retention and understanding by creating more vivid and concrete learning experiences. For instance, cultural immersion through sensory materials such as food and music from the target culture has been shown to foster deeper emotional connections to language learning, leading to improved outcomes. This approach aligns well with Suggestopedia’s emphasis on creating an engaging and supportive learning environment, laying the groundwork for a holistic educational model that incorporates both language acquisition and environmental education.

One particularly promising tool for this integration is the use of comic strips, which combine visual storytelling with humour and simplified narratives to make complex concepts more accessible and engaging. Comic strips, traditionally seen as entertainment, have evolved into powerful educational tools that cater to a wide range of learning styles. The combination of visuals and text in comic strips can simplify difficult environmental concepts, making them easier to understand while also engaging students emotionally. Furthermore, the humour often found in comic strips reduces anxiety and creates a positive learning environment, aligning with Suggestopedia’s goal of lowering emotional barriers to learning. Visual elements, such as art and illustrations, also play a critical role in Suggestopedia’s multisensory learning. For environmental education, visuals can represent global challenges like deforestation, melting ice caps, or endangered species in ways that students can relate to emotionally. Visual storytelling, especially through mediums like comic strips, adds a narrative layer that transforms abstract ecological issues into concrete, emotionally engaging stories. Research indicates that, “visual storytelling can simplify otherwise complex information, making it digestible and relatable for learners across different age groups” [13]. A notable example of this is Rohan Chakravarty’s comic strip series, *Green Humour for a Greying Planet* [15], which

uses humour and illustration to raise awareness about environmental issues such as climate change, deforestation, and species conservation. By blending environmental content with humour and engaging visuals, these comics provide a unique opportunity to teach students about environmental issues in a way that resonates both cognitively and emotionally. Through comic strips like these, students can develop empathy for the natural world while simultaneously improving their language skills through contextualized learning. Building on the principles of Suggestopedia, which emphasize multisensory engagement, comic strips offer a unique approach to integrating visual and textual elements, which can further lead to the development of a new framework for holistic learning, where students develop cognitive, emotional, and social skills simultaneously. When applied to environmental education, comic strips not only present these topics in a visually engaging format but also use humour, irony, and satire to highlight critical issues, which can increase students' emotional investment in the subject matter. A comic strip illustrating endangered animals affected by pollution, for instance, not only conveys the severity of the issue but also allows students to connect on a personal level by seeing the animals depicted with human traits or expressions, thereby fostering empathy. By presenting environmental challenges in an accessible, story-based format, comic strips can bridge the gap between cognitive understanding and emotional connection. "This emotional engagement is crucial for building empathy toward environmental issues, as it helps students internalize the importance of environmental stewardship" [13]. When students feel emotionally connected to the material, they are more likely to retain information, reflect on their actions, and apply what they have learned to real-world environmental challenges.

3. INTEGRATING ENVIRONMENTAL THEMES THROUGH MULTISENSORY LEARNING

By integrating environmental themes into this framework, "students can develop not only language skills but also emotional and cognitive connections to environmental issues" [16]. Humour, as employed in Suggestopedia, can also play a significant role in reducing anxiety and resistance to complex subjects. Environmental comic strips, such as Rohan Chakravarty's *Green Humour for a Greying*

Planet, blend humour with critical ecological issues, making environmental degradation approachable without diminishing its importance. By using humour to alleviate the inherent tension surrounding discussions of global environmental crises, Suggestopedia helps students connect emotionally with these issues in a way that promotes critical thinking rather than defensiveness or disengagement. Humour can break down emotional resistance, helping students internalize the severity of environmental challenges while still feeling empowered to take meaningful action. According to Crawford [17], humour is defined as any communication that generates a "positive cognitive or affective response from listeners." This definition underscores the role of humour in enhancing the emotional climate of a learning environment, making it an invaluable tool for educators. Humour can serve as an icebreaker, helping to alleviate tension and create a more relaxed and open atmosphere where students feel comfortable expressing themselves. According to Yip and Martin [18], "people who demonstrate self-enhancing and affiliative humour are better able to initiate conversations with strangers and make friendships easily." This type of humour fosters a sense of connection and camaraderie, which is essential in a classroom setting where collaboration and peer support are crucial. By using humour, teachers can help students develop these social skills, promoting a more cohesive and interactive classroom community. When laughter is shared, it strengthens relationships and enhances the overall learning experience, making it more enjoyable and effective. Integrating humour into educational practices not only supports cognitive and academic growth but also nurtures the emotional and social development of learners. Glenn [19] asserts that, "humour has the potential to involve students in the learning process by focusing on the knowledge they need to learn by creating a positive, emotional, and social environment." This positive atmosphere can transform the classroom into a lively and interactive space where students are more engaged and willing to participate. Dormann and Biddle [20] state that, "humour can have a positive effect on motivation in the learning process as it can provide students with creative thinking skills while performing learning activities." These skills are crucial for problem-solving and innovation, which are essential components of effective learning. However, the use of humour in education requires careful consideration, as it can significantly influence the learning environment

[21]. If not balanced properly, humour may divert students' attention from the subject matter, leading them to focus more on entertainment than on learning, resulting in them enjoying the experience without fully engaging with the content.

The integration of environmental themes into language education offers a dual-focused learning approach that aligns with the goals of both Suggestopedia and environmental literacy. In this context, students not only develop language skills—such as vocabulary, syntax, and communication—but also build an understanding of environmental issues, encouraging them to reflect on their role as stewards of the planet. By combining language learning with environmental content, Suggestopedia fosters both linguistic proficiency and ecological literacy, providing students with the tools to engage with global environmental challenges both intellectually and emotionally. A key aspect of this integration is the use of multisensory tools. Comic strips, for example, serve as an ideal vehicle for introducing environmental topics in the language classroom. The narrative and visual elements of comic strips allow for the contextualization of vocabulary within meaningful discussions about ecology. In a lesson focused on pollution, students might be asked to interpret a comic strip showing animals affected by plastic waste. As they discuss the strip's dialogue and visuals, students acquire new vocabulary while also engaging with the ecological consequences of pollution. In addition to comic strips, music and soundscapes can be used to enhance the sensory experience of environmental language lessons. By incorporating natural sounds into the classroom, educators can create an immersive atmosphere where students feel more connected to the material. For instance, in a lesson about deforestation, playing sounds of a forest followed by the noise of chainsaws cutting down trees could evoke a visceral reaction in students, leading to a discussion on the environmental and linguistic implications of the lesson. "This approach not only enhances linguistic proficiency but also encourages students to reflect on their role in addressing global environmental challenges" [22]. Interactive discussions and group activities are another vital part of this multisensory, dual-focused approach. Through role-playing exercises, students might take on the personas of various stakeholders in an environmental debate (such as government officials, conservationists, and community members), using their language skills to argue

different perspectives on ecological issues. This not only strengthens their language abilities but also helps them understand the complexities of sustainable development and environmental policy. The principles of Suggestopedia, when aligned with sustainability education, create a holistic learning experience where students engage deeply with both language acquisition and environmental literacy. For instance, a lesson structured around the use of environmental comic strips can simultaneously teach language skills and foster environmental responsibility. The visual and narrative elements of the comic strips simplify complex environmental issues, making them more relatable and easier to understand. By incorporating discussions around sustainability, educators can encourage students to reflect on their own environmental practices, making the learning experience more relevant and impactful. In this way, Suggestopedia supports sustainable development by helping learners navigate the complexities of sustainable practices within their communities, fostering ethical engagement in their everyday lives.

4. LANGUAGE ACQUISITION AND ENVIRONMENTAL LITERACY

According to a study, "The alterations in the role of foreign languages in educational systems suggest that integrating language with environmental themes could enhance engagement" [23]. This dual focus can lead to a more meaningful and engaging educational experience. In the opinion of Swan, "To enable students to take an active role in the learning process and to improve collaborative learning, the following needs to be included: (1) course materials where students realize their own learning" [24]. Designing lessons that effectively combine multisensory learning with Suggestopedia's principles requires careful planning. The key is to create a learning environment where students can engage their senses and emotions simultaneously, allowing for a more immersive educational experience. The educators can begin the lesson by introducing a visual element related to the environmental topic at hand. This could be a comic strip, an image of an ecosystem, or even a short video clip that showcases a real-world environmental issue. Visual stimuli provide a tangible context for students to start engaging with the topic, activating both their cognitive and emotional responses. For example, an image of a melting glacier could introduce a lesson on

climate change, prompting students to think about the impact of global warming while learning new vocabulary related to the environment. A strip *Green Humour for a Greying Planet* addresses similar issue of climate change, particularly the melting of polar ice caps and its impact on polar bear habitats. By personifying polar bears and giving them human-like dialogue, the comic strip helps readers empathize with the animals' plight. The caption, "Thanks to climate change, we've permanently displaced the most popular cartoon cliché," highlights the dire situation with a touch of irony and wit [15]. Visual learners, in particular, benefit from the pictorial representation of information, which can enhance comprehension and retention. Furthermore, the narrative aspect of comics can engage students emotionally and cognitively, making the learning experience more holistic. Topkaya and Yilar [25] stated that "educational comics make the course content more interesting through funny characters and short stories in the teaching process, and this triggers children's imagination and positively affects their motivation towards the lesson." By capturing students' interest with engaging narratives and relatable characters, educational comics create a more dynamic and interactive learning environment. This heightened interest can lead to increased participation and enthusiasm for the subject matter. Additionally, the storytelling aspect of comics can help in making complex topics more relatable and easier to understand, thus facilitating deeper learning. According to McVicker, "Through the visuals presented with the text, communication is developed and expanded, and these visuals attract the attention of the reader and make the text easier to understand" [26]. The combination of text and images in comics helps bridge the gap between abstract concepts and concrete understanding, making complex ideas more accessible. This dual coding process, where information is processed both visually and verbally, enhances cognitive processing and memory. The visual elements of comics also cater to diverse learning needs, including those of students who may struggle with traditional text-based materials. As stated by Weitkamp and Burnet, "The fact that comics are quick and easy to understand indicates that they can be a suitable teaching tool for the education of large masses" [27]. Their simplicity and clarity make them particularly effective for disseminating information to diverse audiences, including those with varying levels of literacy and language proficiency. This accessibility ensures that

educational comics can be used to reach a wide range of learners, making education more inclusive. Moreover, the brevity of comics allows for efficient delivery of information, which can be particularly useful in environments where time is limited. As the lesson progresses, music or soundscapes that reflect the environmental themes being can be incorporated. For instance, when teaching about endangered species, playing the sounds of wildlife or the ambient noise of a forest can create a calming atmosphere that helps students focus. Alternatively, more intense soundscapes—such as the sounds of deforestation or urban pollution—can evoke emotional responses, prompting students to engage more deeply with the material. The combination of auditory and visual stimuli reinforces memory retention and emotional engagement, which are crucial for effective language learning. Furthermore, collaborative discussions foster collective intelligence, allowing students to learn from one another and engage with different perspectives on the issue.

In Cheesman's [28] study, "students think that comics positively affect the atmosphere of the classroom and turn it into a fun environment." Integrating comic strips into language lessons provides an additional layer of engagement by combining narrative and visual storytelling. Comic strips are particularly useful for explaining complex environmental topics in a way that is both approachable and humorous. In a lesson on plastic waste, for example, a comic strip could depict animals dealing with the impacts of pollution in their habitat. Students can read the comic, identify key vocabulary, and then work in groups to create their own comic strips that illustrate solutions to the problem. This exercise not only strengthens language skills but also encourages creativity and problem-solving in relation to environmental challenges. The final stage of the lesson should involve reflection and emotional engagement. Suggestopedia's emphasis on creating a relaxed, supportive environment allows students to connect with the material on a personal level. Educators can facilitate discussions that encourage students to reflect on how the environmental issues discussed in the lesson affect their own lives and communities. These discussions help students internalize both the language and the environmental content, deepening their understanding and motivating them to act in their personal lives. When students feel emotionally safe and supported, they are more willing to take

risks, make mistakes, and actively participate in lessons. This leads to greater confidence in their language abilities and encourages a positive attitude toward learning. Additionally, the integration of environmental themes into language education offers students the opportunity to develop both linguistic proficiency and environmental literacy. By engaging with real-world ecological issues in the language classroom, students gain a deeper understanding of the challenges facing the planet and are motivated to reflect on their own roles in promoting sustainability. This dual-focused learning approach not only equips students with the language skills they need but also fosters responsible citizenship, encouraging them to take an active role in addressing global environmental challenges. Finally, the collaborative learning environment fostered by Suggestopedia's emphasis on group activities and collective intelligence encourages students to learn from one another. By working together on language tasks related to environmental issues, students build important social and communication skills, preparing them for future collaboration in both academic and professional settings [29,30].

5. CONCLUSION

The integration of Suggestopedia with multisensory learning and environmental education represents a nuanced evolution in pedagogical practices, blending linguistic and ecological literacy within an emotionally supportive framework. In this model, emotional engagement is not ancillary but central to the learning process, enabling students to navigate complex content with greater depth and retention. The use of humour and narrative structures, particularly in the context of environmental comic strips, creates a bridge between abstract ecological concepts and personal relevance, ensuring that students leave the classroom with both a linguistic toolkit and a reflective awareness of their place in global environmental discourses. Moreover, the dual focus on language learning and environmental themes elevates the educational experience by embedding knowledge within an ethical framework. In an era where sustainability has become a central concern across disciplines, this approach equips students not only with the ability to communicate across cultures but also with the critical awareness to engage meaningfully with issues of global significance. This educational model

aligns with the growing need for interdisciplinary approaches in academia, where the development of linguistic skills is intricately linked to broader cultural and environmental literacy. As education continues to adapt to the demands of a rapidly changing world, the integration of language education with environmental awareness offers a path forward that is not only academically rigorous but also socially and environmentally conscious. This pedagogical fusion, drawing on both linguistic expertise and sustainability literacy, paves the way for a more comprehensive and reflective form of education, one that equips students not just with skills, but with the conscience and capacity to apply them in a meaningful and impactful way.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Grove, Nathaniel, Bretz, Stacey. A continuum of learning: From rote memorization to meaningful learning in organic chemistry. *Chemistry Education Research and Practice*. 2012;13:201-208. Available:https://www.researchgate.net/publication/244478165_A_continuum_of_learning_From_rote_memorization_to_meaningful_learning_in_organic_chemistry
2. Anzovino ME, Bretz SL. Organic chemistry students' fragmented ideas about the structure and function of nucleophiles and electrophiles: A concept map analysis. *Chemistry Education Research and Practice*. 2016;17(4):1019-1029. Available:<https://doi.org/10.1039/C6RP00111D>
3. Lozanov G. Suggestopedia: A methodology for foreign language teaching. In *foreign language learning: Psycholinguistic studies on training*. New York: Academic Press. 1978;13-43.
4. Garcia A, Pintrich PR. The role of self-regulated learning in learning and

- achievement. In *Educational Psychologist*. 1996;31(2):87-93.
5. Ostrander S, Schroeder L. *Psychic discoveries behind the Iron Curtain*. Englewood Cliffs: Prentice-Hall, Inc; 1970.
 6. Ostrander S, Schroeder L. *Handbook of PSI discoveries*. New York; Berkley; 1974.
 7. Lynch DN. *Student centered learning: The approach that better benefits students*. Virginia Wesleyan College; 2010.
 8. Mayer RE, Estrella G. Benefits of emotional design in multimedia instruction. *Learning and Instruction*. 2014;33(1):12–18.
Available:<https://doi.org/10.1016/j.learninst.ruc.2014.02.004>
 9. Kroese J. An interactive plant as a learning interface embodying environmental education in the natural environment; 2017.
Available:<https://www.semanticscholar.org/paper/7c49498ce1fd6cf610769f8f25543d6c7b034c1c>
 10. Bancroft WJ. Education for the future or the lazanov system revisited. *The Educational Courier* 1973;43(8):11-13. (b)
 11. Lozanov G. The suggestopedic education and instruction in all subjects in the 10th form of the general educational schools. *Problems of Suggestology*. Symposium presented at the meeting of the First International Symposium on Suggestology, Sofia, Bulgaria; 1971(b).
 12. Tashev T, Natan T. Suggestion, teachers and doctors. *Bulgaria Today*. 1966;9.
 13. Silva MJ, Gouveia C, Gomes CA. The use of mobile sensors by children: A review of two decades of environmental education projects. *Sensors (Basel, Switzerland)*; 2023.
Available:<https://www.mdpi.com/1424-8220/23/18/7677>
 14. Hinton V. *Multisensory teaching of basic language skills*. Baltimore: Paul H. Brookes Publishing Co; 2014.
 15. Chakravarty R. *Green humour for a greying planet*. Penguin Books; 2021.
 16. Garza EV, Kennedy KD, Arreguín-Anderson MG. ESL/SSL strategies that bridge content and language in science: Experiential learning in an environmental education workshop. *Journal of Language Teaching and Research*; 2014.
Available:<https://www.semanticscholar.org/paper/c11e9f4dbc3a0f424623ddb32a0e6ecf00e88dd6>
 17. Crawford SA, Caltabiano NJ. Promoting emotional well-being through the use of humour. *The Journal of Positive Psychology*. 2011;6(3):237-252.
 18. Yip JA, Martin RA. Sense of humor, emotional intelligence, and social competence. *Journal of Research in Personality*. 2006;40(6):1202-1208.
 19. Glenn R. Brain research: Practical applications for the classroom. *Teaching for Excellence*. 2002;21(6):1–2.
 20. Dormann C, Biddle R. Humour in game-based learning. *Learning, Media and Technology*. 2006;31(4):411–424.
Available:<https://doi.org/10.1080/17439880601022023>
 21. Hellman SV. Humor in the classroom: Stu's seven simple steps to success. *College Teaching*. 2007;55(1):37–39.
Available:<https://doi.org/10.3200/CTCH.55.1.37-39>
 22. Smith J. *Multisensory Learning and its Effect on Students with Autism*; 2019.
Available:<https://www.semanticscholar.org/paper/a7205f2678542dab8db89bfc24446ad9e015697b>
 23. Humeniuk I, Prokopova O, Maksymets O, Polishchuk A. (2023). Language acquisition for ESP students with suggestopedia method application. 22 nd International Scientific Conference Engineering for Rural Development Proceedings; 2019.
Available:<https://www.semanticscholar.org/paper/8580d224306ba0b51a100683a17f893a2273bbde>
 24. Swan K. Virtual interaction: Design factors affecting student satisfaction and perceived learning in asynchronous online courses. *Distance Education*. 2001;22(2): 306–331.
Available:<https://doi.org/10.1080/0158791010220208>
 25. Topkaya Y, Yilar B. Analysis of student views related to educative comics. *Route Educational and Social Science Journal*. 2015;2(3):106- 117.
 26. McVicker CJ. Comic strips as a text structure for learning to read. *The Reading Teacher*. 2007;61(1):85–88.
 27. Weitkamp E, Burnet F. The chemedian brings laughter to the chemistry

- classroom. International Journal of Science Education. 2007;29(15):1911–1929.
28. Cheesman K. Using comics in the science classroom. Journal of College Science Teaching. 2006;35(4):48-51.
29. Bretz SL. Novak's theory of education: Human constructivism and meaningful learning. Journal of Chemical Education. 2001;78(8):1107.
30. Novak JD. Meaningful learning: The essential factor for conceptual change in limited or inappropriate propositional hierarchies leading to empowerment of learners. Science Education. 2002;86(4):548-571. Available: <https://doi.org/10.1002/sce.10032>
- Available: <https://doi.org/10.1021/ed078p1107.6>

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of the publisher and/or the editor(s). This publisher and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.

© Copyright (2024): Author(s). The licensee is the journal publisher. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:

<https://www.sdiarticle5.com/review-history/124228>