

Do You Re(meme)ber: Reconstructing Memes as a Summary for Recall and Comprehension in Mapua University

Marian Ingrid A. Saucó, Mapua University, Philippines
Marvin B. De Leon, Mapua University, Philippines

The Asian Conference on Education 2024
Official Conference Proceedings

Abstract

The education crisis in the Philippines is a problem that millions of Filipinos face. Despite being a country where students spend the most hours in school, the Philippines is less productive than other countries (Philippine Business for Education, 2023). The K-12 system was employed in the Philippines to improve quality education and enhance students' academic skills and competency (Almerino et al., 2020). With the prevailing challenges in the Philippine education system, the study seeks to improve quality education by exploring the potential use of memes in education. This study explored memes to improve recall and comprehension in Chemistry through a mixed-method approach. The study used Molina's (2020) guidelines to deconstruct the learning material and memes. Through deconstruction, the study was able to identify three ways to create memes for education: (1) panel layout, (2) conditional layout, and (3) map layout. The study also used a content analysis for the responses and a survey to measure the effectiveness of memes. The results showed that memes are an effective means to recall, comprehend, and summarize a lesson. The memes created for the study is most effective in terms of comprehension, while some students think that memes are an effective way to recall and provide an educational summary. Future scholars may consider changing the study's methodology to explore other geographical contexts and apply the study in other disciplines to have a more cohesive understanding of memes in education.

Keywords: Internet Memes, Educational Memes, Comprehension, Recall, Chemistry

iafor

The International Academic Forum
www.iafor.org

Introduction

The rise of social media has changed the way people interact and communicate. Education is also changing as people find new communication methods through social media. Recent news claims that TikTok, a popular short-form video application, is also gaining attention for transforming how students learn.

Despite controversies surrounding TikTok, it is found that 69% of users have shared that TikTok has helped with their homework (Langreo, 2022). Several studies similarly found that using TikTok promotes student motivation and engagement (Adnan, 2021; Escamilla-Fajardo et al., 2021; Khlaif & Salfa, 2021; Yélamos-Guerra, 2022). The way people learn has transformed as technology and social media have introduced new means of communication. Aside from TikTok, memes are among the latest means of communication that emerged with technology and social media. Most viral memes are in image and text format, often containing the reality of a person's experience (Milosavljević, 2020).

Today, memes are often associated with the younger generation, which includes Generation Z and Millennials (Harshavardhan, 2019). Young college students are involved with using memes to express their opinions and views on sociopolitical issues (Harshavardhan, 2019). Moreover, memes' humorous and light-hearted nature makes them appealing to many youths today (Harshavardhan, 2019). One local study found that Filipino students who were taught internet memes about mathematics and were given the chance to create memes based on their understanding of the lesson had positive results (Godinez, 2023). In another local study, it found that memes have the potential to be used in classrooms to promote humor and creativity. They expounded that memes could be used to represent and communicate people's experiences using a form of media (Valenzuela et al., 2022).

With all of these in mind, it is evident that there is a vast potential for memes to be applied in education. However, existing studies are still limited and could be developed, especially in various cultural and geographical contexts. This study aimed to contribute helpful knowledge on the development of memes as an educational tool that could potentially improve quality education in the Philippines.

The study sought to create memes that can summarize complex concepts such as science and math, as these are the subjects that many Filipino students struggle with. According to Rogayan and colleagues (2021), Filipino STEM students have trouble with the level of difficulty of STEM courses. In addition, many SHS students from the Philippines choose a different SHS strand due to the grade requirements to qualify as a STEM student and the negative perceptions towards taking STEM (Andrada & Marasigan, 2020). The STEM strand usually includes technical and scientific courses that many Filipino students struggle with. The Philippines also had the lowest scores in math and science among 58 countries that participated in the Trends in International Mathematics and Science Study (TIMSS). Moreover, it was also found that only 16% of Filipinos can understand math, while only 23% can understand and explain scientific phenomena (Chi, 2023).

In particular, the study focused on creating memes related to chemistry lessons, precisely Le Chatelier's principle and the steps in solving using the ICE table method. While there have been a few studies about memes in the context of education in the Philippines, none of them has yet used memes as an educational tool to explain a concept from a lesson. The present

study intends to localize memes as an educational tool to teach scientific lessons. As such, the research questions that guided the study are as follows:

1. What are the processes for memes to be used as a summary for promoting recall and comprehension in chemistry?
2. What are the visual design elements needed in an educational meme that can summarize scientific concepts and can promote recall and comprehension?
3. How effective are memes in terms of improving recall and comprehension of students?

Methodology

A. Conceptual Framework

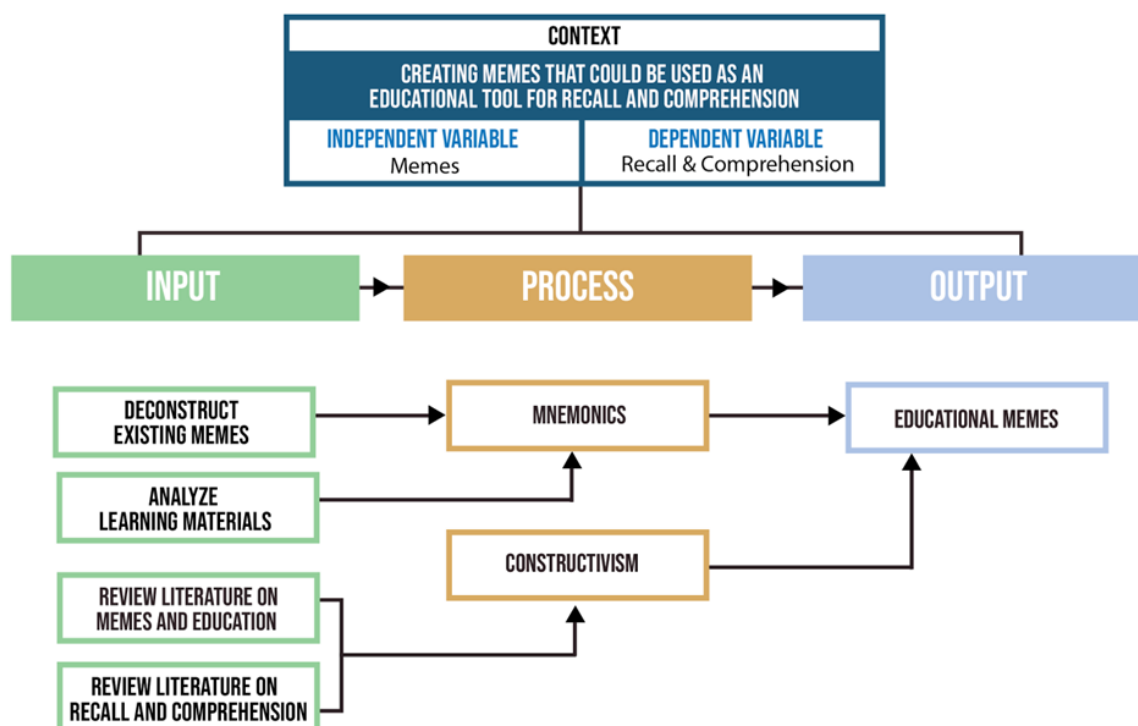


Figure 1: Conceptual Framework Using Context-Input-Process-Output Model (CIPO) Framework

Using the Context-Input-Process-Output model (CIPO) framework, this section discusses the conceptual guidelines to accomplish the study's objectives. As mentioned earlier, the objectives of the study are (1) to determine the processes for memes to be used as a summary for promoting recall and comprehension, (2) to identify the visual design elements needed in an educational meme that can summarize scientific concepts that can promote recall and comprehension, and (3) to measure the effectiveness of memes in terms of improving recall and comprehension.

For the first objective, the inputted data needed are literature about memes, education, recall, and comprehension, all analyzed using constructivist learning theory. Understanding existing literature helped determine how memes may be used as an educational tool for recall and comprehension. Apart from this, the study also inputted meme samples and creations guided

by mnemonics and the six characteristics that make an internet meme by *Molina (2020)* in the process.

Deconstructing viral memes on the Internet satisfies the study's second objective, determining the elements needed to make a meme that can summarize complex concepts. The researcher utilized the identified meaning of a meme to help create an educational meme, which is the intended output of the study. The last input in the conceptual framework is the learning materials provided by the science teacher partnered in this study. The learning materials provided are the uniformed PowerPoint presentation by the Mapua SHS science department for course outcome 5, which covers the lesson on Le Chatelier’s principles and the steps in solving using the ICE table method.

The last objective of the study is satisfied through the instruments to be used—a mixed-method survey. The qualitative part of the survey asks the respondents for an open-ended response about the memes they have encountered. In contrast, the quantitative part of the survey is a validated Likert scale that deals with knowing the effectiveness of the memes deployed.

B. Data Collection Procedure

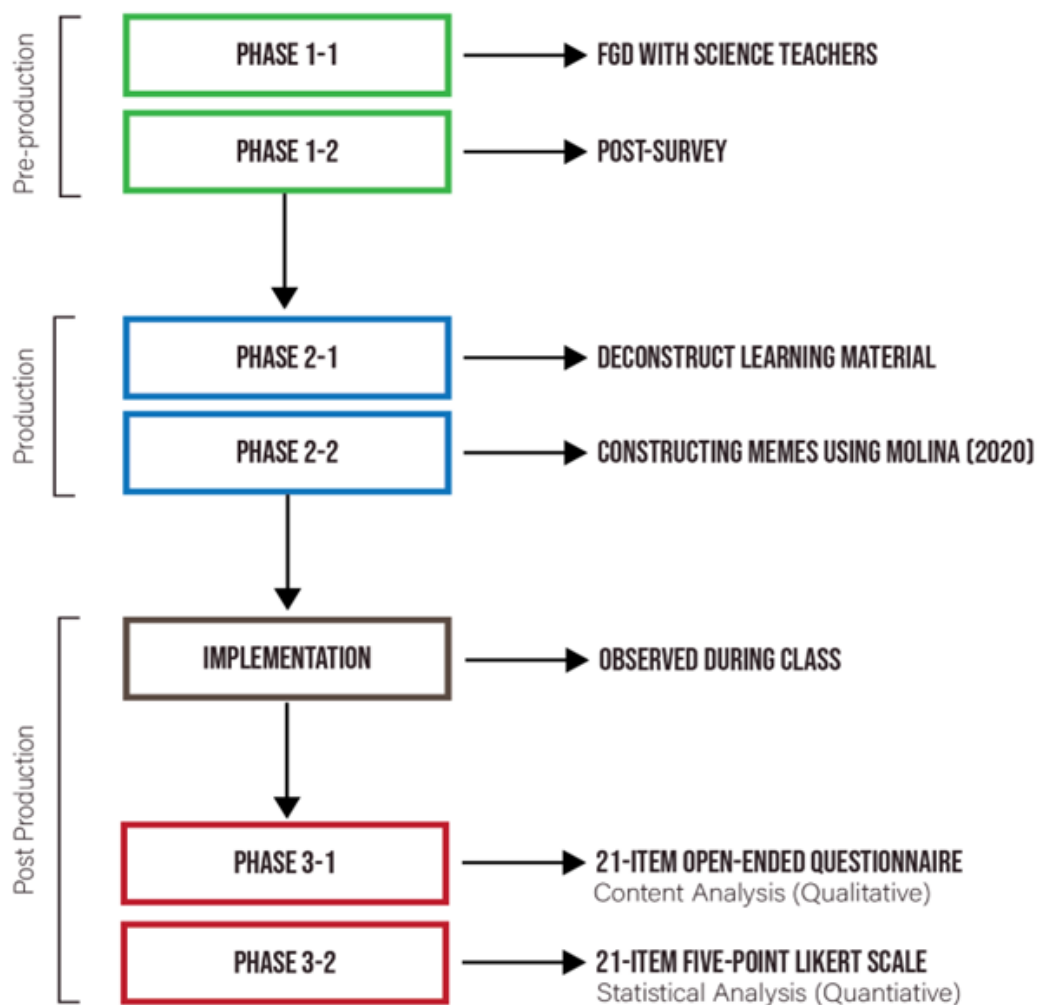


Figure 2: Data Collection Procedure

The pre-production phase includes **Phase 1-1**, which refers to the FGD with the science teachers, and **Phase 1-2**, which refers to the qualitative post-survey form that seeks to understand why students struggle with learning chemistry.

The production phase includes Phases **2-1**, deconstructing the learning material using mnemonics. **Phase 2-2** refers to constructing memes based on the definition of simplified lessons. Memes contain memorable aspects such as photos and words that could call an experience, information, feeling, or response (Maryme, 2020). Mnemonics guided the study in formulating memes and figuring out the elements needed to translate a complex lesson into a memorable meme that students could recall. For further validation, the study used the guidelines by **Molina (2020)**, wherein she established the prevailing characteristics found in internet memes. In addition, the lens of constructivism was used as a theory in analyzing the results of the study.

Table 1: Molina (2020) Characteristics of an Internet Meme

Characteristics of an internet meme	Definition (Molina, 2020)
<i>Visual Format</i>	Memes can be in images and videos. For image memes, its communicative value increases when it is accompanied with a text that relates to the image.
<i>Intertextual Nature</i>	A meme's visual format does not create meaning. However, the intertextuality of a meme refers to the expression from the combination of the image and text of the meme. A meme can be understood through the combination of both components (i.e., image and text)
<i>Cultural Component</i>	Memes also consider its original conceptualization as a cultural artifact that creates symbolic resources within a culture. A meme can be understood, depending on its assigned culture.
<i>Stance</i>	This refers to the social role of the meme. This can either be positive or negative.
<i>Virality</i>	For a content to be considered as a meme, it must be shared through the internet. The virality of a meme refers to its shareability that allows memes to evolve through time. It also refers to the imitative qualities that makes a meme easily shareable and relatable.
<i>Imitation</i>	Memes start as a concept that becomes transmitted with slight modifications from each person. Internet memes have imitative qualities but vary in its means of propagation and replicability.

After the production phase, the first part of the post-production phase is the *implementation*, which is the time that the researcher observed during the class where the memes were deployed to all the Grade 11 students. Phases 3-1 and 3-2 refer to the online survey collected after eight days since the memes were shown to the students. *Phase 3-1* refers to the 21-item

open-ended questionnaire wherein the responses collected were analyzed using a content analysis. *Phase 3-2* refers to the 21-item five-point Likert scale wherein the gathered responses from this were statistically analyzed.

Results

Research Question 1:

The following steps may be referenced in implementing memes in education: (1) Collect and Assess, (2) Deconstruct learning material, (3) Construct memes, (4) Implement memes, and (5) Analyze and Interpret

Research Question 2:

Overall, all of the memes were able to promote recall. The students could recognize the lessons from Le Chatelier's principle and the steps in solving using the ICE table method. For the elements, the students could primarily recall the memes used in each of the seven memes. In addition, most of the students recalled graphics and color in each of the memes. In terms of file format, adding moving graphics such as GIFs could catch students' attention and interest, making them recall the lesson and elements better. Finally, most students could comprehend Le Chatelier's principles as they could accurately explain the concept based on their understanding of the memes. Many students could still enumerate the steps for solving using the ICE table method. However, some students expressed that there are too many elements in the seventh meme, making it quite challenging for some students to understand.

Research Question 3:

Table 2: Results of Overall Effectiveness of Memes as Recall, Comprehension, and Summary

Overall Effectiveness of Memes			
Effectiveness	Mean	SD	
Recall	3.88	0.81	Effective
Comprehension	3.89	0.80	Effective
Summary	3.88	0.80	Effective

Legend: 1.00-1.80 (Very Ineffective), 1.81-2.60 (Ineffective), 2.61-3.40 (Neutral), 3.41-4.20 (Effective), 4.21-5.00 (Very Effective)

Discussion

The memes are the most effective regarding comprehension (M=3.89, SD=0.90). Most respondents also think that the memes are effective for recalling (M=3.88, SD=0.81) and providing an educational summary (M=3.88, SD=0.80). Meme 3 is the most effective out of all the memes (M=3.99, SD=0.86). The respondents agree that the meme helped improve their understanding (M=4.00, SD=0.89) and recall (M=3.99, SD=0.91) of the concept, "Change in concentration of a reactant or product when removed". They think this meme is a compelling topic summary (M=3.99, SD=0.86). In addition, Meme 2 is the most effective for recall (M=4.03, SD=0.91) and summarization (M=4.01, SD=0.91), while Meme 3 is the most effective for improving comprehension (M=4.00, SD=0.89). The possible reason meme 3 is effective could be external factors. In class observation, many students were still distracted

when meme 1 was introduced because some were late in class, some were eating their food, and some were using their phones. However, as the class progressed, memes 2 and 3 sustained better engagement as the teacher could grab the student's attention when they saw the trade offer meme. While memes 4 to 6 also used the trade offer meme, it is possible that memes 2 and 3 were more effective as it was the first of the series of trade offer memes introduced. It is possible that the student's attention became less focused when the other memes were shown.

On the other hand, meme 7 was the least effective ($M=3.47$, $SD=1.02$). However, it is still effective for the students in helping them recall ($M=3.47$, $SD=1.05$), summarize ($M=3.46$, $SD=1.09$), and understand the steps in solving the ICE table method ($M=3.47$, $SD=1.09$). The possible reason meme 7 is the least effective among the memes is due to sensory overload. Many of the responses in the content analysis raised the fact that they did not recall anything from the meme due to it having too many visual cues. While Meme 7 summarized the topic through a map layout design, it still did not meet the recall and comprehension of students as it had too many visual cues that became distracting and counterproductive. Despite this, meme 7 and the other memes are effective, which could imply that memes in learning stimulate assimilation and accommodation according to constructivism. Assimilation refers to modifying new information to fit into what the mind already knows, while accommodation refers to the external realities to arrive at a better understanding. According to Ghaour (2016), when the students' beliefs are unmatched by what is being presented, the student is drawn to resolve the conflict through assimilation and accommodation. Relating these to the memes, it is possible that the students were drawn to resolve the conflict they saw with what the memes represented. They tried to fit or adapt what they knew to what was shown in the meme, allowing them to recall and comprehend. How the memes were used could create a mismatch between what the students usually consume and what they consume. Since memes are more commonly used in social media for entertainment, the students were likely surprised that they saw them in their class, which could grab their attention and draw them to resolve what is being shown in the meme. Moreover, it is worth noting that many of the students elucidated how their teachers do not use memes in any of their subjects or lessons. Hence, they were surprised and more interested when they saw the meme.

Conclusion

In conclusion, using FGD was useful in gathering the insights and experiences of science teachers. The FGD allowed the researcher to identify chemistry as the science subject most Grade 11 students struggle with. Furthermore, deconstructing the learning material and memes through constructivism and mnemonics helps identify the ways memes can be created as a summary for promoting recall and comprehension. Through mnemonics, the study was able to simplify the definition of the topics through word association. In deconstructing the learning material, the researcher identified two types of topics: concept- and process-based. Furthermore, the study was able to identify three ways to create memes as a summary: (1) panel layout, (2) conditional layout, and (3) map layout design. In translating the learning material into a meme, the researcher also deconstructed the definitions through mnemonics. Using the guidelines of Molina (2020), the study concluded that the characteristics found in memes and supporting them with visual design elements help promote recall and comprehension among Gen Z students. With this, using memes in education benefited students and teachers as the memes made learning easier for students.

Creating open-ended questions in the survey provided useful insights about how effective the memes are for the students. Using a content analysis provided feedback that addressed the need of the student to learn the concept effectively. Furthermore, the content analysis identified the main visual elements needed to create an effective meme for recall and comprehension: visual format, layout, and graphics. GIFs in memes are more effective than static images. Among the three ways of creating meme layouts, which are (1) panel, (2) conditional, and (3) map, the conditional layout design had the greatest effect in improving recall and comprehension. Meanwhile, the map layout meme was the least effective due to sensory overload caused by the numerous visual cues present in the meme. In terms of graphics, the study concluded that using viral and timely memes as the main character yielded better recall and comprehension. Consequently, humor in memes was favorable to Gen Zs. Using the Five-point Likert Scale in the online survey provided a feasible way of measuring the effectiveness of the memes in education. It is also worth considering that even though the memes are effective, the study's results are still limited as it elucidated that the memes in the study are not highly effective, which could indicate improvement.

References

- Adnan, N. I., Ramli, S., & Ismail, I. N. (2021). Investigating the usefulness of TikTok as an educational tool. *International Journal of Practices in Teaching and Learning (IJPTL)*, 1(2), 1-5. <https://ir.uitm.edu.my/id/eprint/52140/>
- Agaton, C. B., & Cueto, L. J. (2021). Learning at home: Parents' lived experiences on distance learning during COVID-19 pandemic in the Philippines. *International Journal of Evaluation and Research in Education (IJERE)*, 10(3), 901. <https://doi.org/10.11591/ijere.v10i3.21136>
- Akram, U., Drabble, J., Cau, G., Hershaw, F., Rajenthiran, A., Lowe, M., Trommelen, C., & Ellis, J. G. (2020). Exploratory study on the role of emotion regulation in perceived valence, humour, and beneficial use of depressive internet memes in depression. *Scientific reports*, 10(1), 899. <https://www.nature.com/articles/s41598-020-57953-4>
- Akram, U., Irvine, K., Allen, S. F., Stevenson, J. C., Ellis, J. G., & Drabble, J. (2021). Internet memes related to the COVID-19 pandemic as a potential coping mechanism for anxiety. *Scientific reports*, 11(1), 22305. <https://pubmed.ncbi.nlm.nih.gov/34772957/>
- Almerino, P., Ocampo, L., Abellana, D., Almerino, J., Mamites, I., Pinili, L., Tenerife, J., Sitoy, R., Abelgas, L., & Peteros, E. (2020). Evaluating the Academic Performance of K-12 Students in the Philippines: A Standardized Evaluation Approach. *Education Research International*, 2020. <https://doi.org/10.1155/2020/8877712>
- Al-Rawi, A. (2021). Political memes and fake news discourses on Instagram. *Media and Communication*, 9(1), p. 276 - 290. <https://doi.org/10.17645/mac.v9i1.3533>
- Andrada, M. D., & Marasigan, A. P. (2020). An Inquiry into the K to 12 Science, Technology, Engineering and Mathematics Students' Persistence. *IOER International Multidisciplinary Research Journal*, 2(1). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3546006
- Antón-Sancho, Á., Nieto-Sobrinó, M., Fernández-Arias, P., & Vergara-Rodríguez, D. (2022). Usability of memes and humorous resources in virtual learning environments. *Education Sciences*, 12(3), 208. <https://doi.org/10.3390/educsci12030208>
- Bautista, M. C., & Aranas, M. V. (2023). The learning crisis in Philippine education: An overview. Philippine Institute for Development Studies. <https://pidswebs.pids.gov.ph/CDN/document/pidspn2317.pdf>
- Benoit, G. (2018). Mathematics in popular culture: an analysis of mathematical internet memes. Teachers College, Columbia University.
- Bhattacharya, P. (2019). Social Degeneration through Social Media: A Study of the Adverse Impact of "Memes." 2019 Sixth HCT Information Technology Trends (ITT). [doi:10.1109/itt48889.2019.9075096](https://doi.org/10.1109/itt48889.2019.9075096)

- Bini, G. G. (2021). How Spiderman can teach you math: The journey of memes from social media to mathematics classrooms. In Connected Learning Summit (pp. 20-27). Carnegie Mellon University, ETC Press. <https://doi.org/10.1184/R1/13530038.v2>
- Boffone, T. (2022). Do you want to make a TikTok? Is it time to BeReal?: Gen Z, social media, and digital literacies. *The Journal of Language & Literacy Education*, 18(2). <http://jolle.coe.uga.edu/wp-content/uploads/2022/12/Boffone-2022-Final-1.pdf>
- Brown, J. D. (2020). What do you meme, professor? An experiment using “memes” in pharmacy education. *Pharmacy*, 8(4), 202. <https://www.mdpi.com/2226-4787/8/4/202>
- Chi, C. (2023). Philippines still lags behind world in math, reading and science — PISA 2022. *Philippine Star*. <https://www.philstar.com/headlines/2023/12/06/2316732/philippines-still-lags-behind-world-math-reading-and-science-pisa-2022>
- De Leon, F. M. G., & Ballesteros-Lintao, R. (2021). The rise of meme culture: Internet political memes as tools for analyzing Philippine propaganda. *Journal of Critical Studies in Language and Literature*, 2(4), 1-13.
- Escamilla-Fajardo, P., Alguacil, M., & López-Carril, S. (2021). Incorporating TikTok in higher education: Pedagogical perspectives from a corporal expression sport sciences course. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 28, 100302.
- Godinez, C. D. O. (2023, January 7). *Promoting Mathematical Discourse in an Online Learning Environment: The Instructional Power of Mathematical Internet Memes*. <https://doi.org/10.35542/osf.io/gcq6v>
- Harshavardhan, V., Wilson, D., & Kumar, M. V. (2019). Humour discourse in internet memes: An aid in ESL classrooms. *Asia Pacific Media Educator*, 29(1), 41-53. <https://doi.org/10.1177/1326365X19842023>
- Khlaif, Z. N., & Salha, S. (2021). Using TikTok in education: a form of micro-learning or nano-learning?. *Interdisciplinary Journal of Virtual Learning in Medical Sciences*, 12(3), 213-218. <https://doi.org/10.30476/ijvlms.2021.90211.1087>
- Langreo, L. (2022). Students Are Turning to TikTok for Homework Help. Is That a Bad Thing? Education Week. <https://www.edweek.org/technology/students-are-turning-to-tiktok-for-homework-help-is-that-a-bad-thing/2022/11>
- Lin, X., & Sun, Q. (2023). Student-generated memes as a way to facilitate online discussion for adult learners. *Psychology in the Schools*. <https://doi.org/10.1002/pits.22884>
- Malbas, M., Kilag, O. K., Diano Jr, F., Tiongzon, B., Catacutan, A., & Abendan, C. F. (2023). In Retrospect and Prospect: An Analysis of the Philippine Educational System and the Impact of K-12 Implementation. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, 1(4), 283-294. <https://multijournals.org/index.php/excellencia-imje/article/view/65>

- Malodia, S., Dhir, A., Bilgihan, A., Sinha, P., & Tikoo, T. (2022). Meme marketing: How can marketers drive better engagement using viral memes?. *Psychology & Marketing*, 39(9), 1775-1801. <https://doi.org/10.1002/mar.21702>
- Marymee, K. B. (2021). Using Memes as Educational Vectors: Analyzing Understanding Amongst College Students in Introductory Organic Chemistry.
- McDaniel, M. A., & Einstein, G. O. (1986). Bizarre imagery as an effective memory aid: The importance of distinctiveness. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 12(1), 54–65. <https://doi.org/10.1037/0278-7393.12.1.54>
- Milosavljević, I. (2020). The phenomenon of the internet memes as a manifestation of communication of visual society-Research of the most popular and the most common types. *Media studies and applied ethics*, 1(1), 9-27. <https://msae.rs/index.php/home/article/view/3>
- Molina, M. D. (2020). ESSENTIAL CHARACTERISTICS. Handbook of visual communication: Theory, methods, and media. https://books.google.com.ph/books?hl=en&lr=&id=WMbaDwAAQBAJ&oi=fnd&pg=PT474&dq=What+Makes+an+Internet+Meme+a+Meme%3F+Six+Essential+Characteristics&ots=ufHYLGpay1&sig=8hF1CUULdH-Yc_4971HNuoLTWpM&redir_esc=y#v=onepage&q=What%20Makes%20an%20Internet%20Meme%20a%20Meme%3F%20Six%20Essential%20Characteristics&f=false
- Philippine Business for Education. (2023). *State of Philippine Education Report 2023*. <https://www.pbef.ph/blogs/47/PBE/State%20of%20Philippine%20Education%20Report%202023>
- Rogayan Jr, D. V., Rafanan, R. J. L., & De Guzman, C. Y. (2021). Challenges in STEM learning: A case of Filipino high school students. *Jurnal Penelitian dan Pembelajaran IPA*, 7(2), 232-244. <https://jurnal.untirta.ac.id/index.php/JPP/11293>
- Salem, H., Siham, S. (2023). Memes as a Memorization Technique in Education. In: Jezic, G., Chen-Burger, J., Kusek, M., Sperka, R., Howlett, R.J., Jain, L.C. (eds) Agents and Multi-agent Systems: Technologies and Applications 2023. KES-AMSTA 2023. Smart Innovation, Systems and Technologies, vol 354. Springer, Singapore. https://doi.org/10.1007/978-981-99-3068-5_30
- Savadkoochi, V. G., Gavagsaz-Ghoachani, R., & Phattanasak, M. (2023). Teaching renewable energy engineering with Gifs and memes: An innovative approach to education. *2023 Research, Invention, and Innovation Congress: Innovative Electricals and Electronics (RI2C)*. <https://doi.org/10.1109/ri2c60382.2023.10356016>
- Valenzuela, C. L., & Batinga, E. M. (2021). Memeiology: A content analysis on the viral covid-19 memes. Available at SSRN 4166456. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4166456

Yélamos-Guerra, M. S., García-Gómez, M., & Moreno-Ortiz, A. J. (2022). The use of TikTok in higher education as a motivating source for students. *Porta Linguarum Revista Interuniversitaria de Didáctica de las Lenguas Extranjeras*, (38), 83-98.
<https://doi.org/10.30827/portalin.vi38.21684>