# The Use of Social Media as a Learning Media Based on Multiple Representation to Increase Student Learning Motivation: Article Review

Hayuni Retno Widarti * [ID] [a], Juwita Karina Pratiwi [a], and Deni Ainur Rokhim [ID] [a,b]

The use of social media can be used as a learning media as in the learning of chemistry. Utilization of social media as a medium of chemistry learning, is considered capable of increasing student motivation and digital literacy. This study aims to analyze the research trends of social media -based learning media, multiple representations of chemical materials and increase student learning motivation. This research method uses the Systematic Literature Review (SLR). Research data obtained from 20 articles originating from the Eric and Google Scholar database. The SLR method is used to identify, review, evaluate and interpret all studies available in the field of subjects that are of interest to a phenomenon involving certain related research questions. Based on the literature review that has been done it can be concluded that research on social media as a learning medium for hydrolysis of salt -based multiple representation can be done with various considerations of the results of previous research.

Graphical abstract
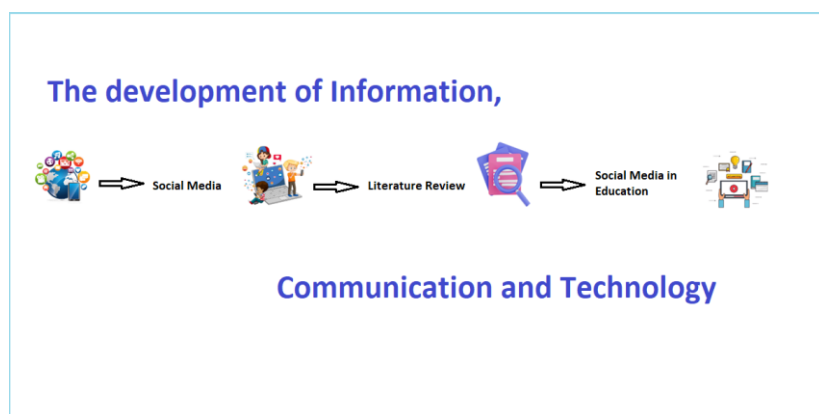
1. Introduction

The rapid development of technology from time to time has influenced the world of education. In the world of education technology makes a significant contribution to the learning process [1], [2]. Utilization of technology in the learning process helps students and teachers to learn and develop critical thinking skills, competencies in various fields, decision making, the ability to deal with dynamic situations and effective communication tools [3]. The rapid development of technology can be utilized for educational purposes. Seeing the Association of Indonesian Internet Service Providers Association [4] 215,626,156 inhabitants from a total of 275,773,901 people in Indonesia from 2022 - 2023 have been connected to the internet. Of the number of people connected to the internet the highest internet penetration is in the age

[a] Departement of Chemistry,Faculty Mathematics and Science, Malang State University Jl. Semarang No.5, Sumbersari, Kec. Lowokwaru, Kota Malang, Jawa Timur 6514, Indonesia. [b] Chemistry,SMAN 3 Sidoarjo, Dr. Wahidin street No.130 Sekardangan, Sidoarjo, Jawa Timur, Indonesia. *E-mail: **hayuni.retno.fmipa@um.ac.id**

range of 13-18 years with a percentage of 98.20%. The reason for the majority of internet use is to access social media such as Facebook, WhatsApp, Instagram, Telegram, Line, Twitter, YouTube. The most commonly used social media is YouTube 65.41%, Facebook 60.24%and Instagram 30.51%.

The use of social media can be used as a learning media as in the Eyes of Chemistry Learning [5]. In line with Pujiono's research [6] which states that social media is a relevant learning media as a bridge of teachers and students in the digital age. Learning media can make the teaching and learning process more effective, efficient and build good relationships between teachers and students. In addition, learning media can help overcome boredom during learning in class [7].

Utilization of social media as a medium of chemistry learning, is considered capable of increasing student motivation and digital literacy [9]. In line with Widarti's research [5] Integrated Learning Media Tiktok and Instagram can increase student motivation that can be seen from the behavior of students who feel worried about other students who have better achievements and want to get student grades in the Best and II group I and II cation qualitative analysis material in his class. Instagram can also increase material clarity, facilitate learning and make it easier to guide the learning process [10]. Supported by Mahzum's research [11] Instagram is able to develop the basic potential of students and increase student motivation caused by an interesting activity in the learning process. The material presented on Instagram makes students understand the lessons faster and avoid the atmosphere of boredom during the learning process. Through the Instagram media the learning environment feels conducive, where students can access material repeatedly so that students can more easily understand the material anywhere and anytime.

Chemistry is one of the scientific disciplines contained in the Merdeka Curriculum at the High School/MA/equivalent precisely in the phase F. Chemistry lessons for some students are considered difficult to understand, less interesting and irrelevant [12]. One of the causes is lack of interest and motivation of students . Characteristics of abstract chemistry cause chemistry to be difficult to learn [12] According to Qurota in Roziah [13] Chemistry consists of several parts that are interrelated and studied through three levels of representation, namely macroscopic, submicroscopic and symbolic.

Based on Irawati in Roziah [13] one of the chemical materials that are considered difficult for upper middle students, namely salt hydrolysis material. In salt hydrolysis material many chemical concepts require a fairly high level of understanding, the fact is that students' conceptual understanding is much lower when compared to algorithmic understanding. Students tend to be able to solve calculation questions compared to conceptual problems that form the basis of the formula used in the calculation problem. This is supported by Sinta's research [14] Salt hydrolysis material is more focused on symbolic aspects of mastery of a quantitative hydrolyzed salt solution pH while for other aspects of representation is still lacking. The incomplete presence of chemical representations in learning hydrolysis of salt can have an impact on the lack of mastery of student concepts. Lack of mastery of students' concepts is in line with the difficulties experienced by students in salt hydrolysis material, according to Roziah [13] One of the difficulties of students is the interests and motivation of students who are still low causing students to learn learning difficulties. One effort that can be done in overcoming student learning

difficulties is to use learning methods that are varied, interesting, sustainable and systematic based on multiple representation. Social -based learning media is considered to be able to increase student motivation. Because social media has interesting features and is easily accessible.

Reviewing students' difficulties with salt hydrolysis material and social media phenomena can be used as chemistry learning media that can increase students' digital literacy and learning motivation [5], [9], [13]. Social media-based learning media has the potential to be a solution to overcome students' understanding difficulties and a means of increasing student learning motivation. As the background has been described, it is important for further research. The author is interested in research entitled "The Use of Social Media as a Multiple Representation Based Learning Media to Increase Student Learning Motivation: Review Article".

2. Results and Discussion

Based on research conducted by Widarti [5] regarding the effect of the use of Tiktok and Instagram social media in student learning motivation on qualitative analysis materials for group I and II states that social media is a relevant learning media and can be a bridge between teachers and students in the digital age . One social media that can be used as learning media is Tiktok and Instagram. Based on research that has been carried out, integrated learning media Tiktok and Instagram in general can increase student motivation that can be seen from the behavior of students who are worried about other students who have better achievements and want to get the value of qualitative analysis of the best and II cations in their class . The shortcomings of the use of social media Tiktok and Instagram as learning media are in its use students can be disturbed by other things when learning material.

Based on research conducted by Alenezi [15] regarding the perspective of students about the use of social media as a learning tool states that the use of social media is most often used by students for personal reasons. 80% of students use social media only limited to communicating with family and friends. The social media used are Twitter, WhatsApp, Instagram, Youtube and Snapchat. The results revealed the assumption that social media is easy to use and can help improve their learning performance through interactions between peers and lecturers, the existence of collaborative learning and involving students.

Based on research conducted by Chukwuere [16] states that social media platforms improve academic performance and make learning fun and easier to understand. Social media increases student participation, collaboration, and involvement in the learning process. Social media also increases communication between students and lecturers so as to increase student interest in learning topics. This study reveals social media motivates students to be productive and increase learning comfort because students can learn without time and location restrictions. Social media platforms are able to improve independent learning, student -centered learning and cooperative learning.

Based on research conducted by Papademetriou [17] states that in the process of education in the integration of social media used by students and teachers proved to be useful. In research conducted 100% of respondents stated social media can improve the learning process. Social media is considered as an economical way to transfer material to students, the teacher easily uploads learning material and students can watch repeatedly to clarify the points of the

material. Social media is also proven to motivate and support the learning process of students as evidenced by 80% of respondents argues that learning with social media becomes more attractive to students. Supported by 85% of respondents feel that social media can motivate learning with interactive and interesting content so that students are inspired to conduct more in -depth research on the material discussed.

Based on research conducted by Erdogdu [10] regarding the opinion of Candidates for Science Teachers on the use of Instagram related to the Science Learning Approach stated using Instagram. In this study, prospective teachers stated that with Instagram can increase material clarity, facilitate learning and make it easier to guide the learning process. Qualitative and quantitative findings in this study also revealed that the posts used in teaching science support a sense of togetherness in online learning, with this sense of togetherness students will be more comfortable with the learning environment while at the same time can increase learning motivation.

Research conducted by Ramazanoglu [18] aims to find out the motivation of teachers in using Instagram applications conducted using a descriptive survey model in quantitative research methods. In this study it was found that Instagram was most widely used for relaxation and development of self -expression with a period of more than 6 hours of use and the least used for entertainment purposes which is less than 1 hour. Based on research findings, it is recommended for teachers to be able to use Instagram in the world of education more dynamically as the use of social media use. By using social media such as Instagram class can be more interactive, dynamic and effective.

Research conducted by Nursakinah [19] states that although in general, Android has been used by teachers and students, but still lacking the use of Android in learning. Based on the literature study conducted, the low student achievement is not due to lack of abilities but because there is no motivation to learn so students do not try to show their abilities. For this reason, it is important for creative teachers in learning. Android -based applications in the topic of acid, base and salt developed by researchers are intended for student knowledge stored in long -term memory and make the knowledge built as meaningful knowledge. From the results of the development of Android applications on the topic of acid, base and salt 77.87% student motivation is classified as good after operating the application.

Iriani research [20] revealed that the rapid development of technology in the world of education affects student learning styles. With the most data that accessing the internet is a millennial generation, there are opportunities for developing digital -based learning media. The development of podcast-tiktok learning media on salt hydrolysis material is categorized as mobile learning-based learning because it can be run on electronic devices such as Android, iOS, and computers. From the results of the research conducted, it was found that the positive results of podcast-tiktok learning that proved that the media was able to motivate student learning outcomes seen from improving learning outcomes through pre-test and post-test values.

Based on Sinta [14] the concept of chemistry is studied in three aspects of representation, namely symbolic, macroscopic, and sub -microscopic aspects. However, in reality in learning chemistry the three aspects of chemical representation are still separate and even more emphasized in one aspect. One example of the case revealed is the salt hydrolysis material that is more focused on the symbolic aspects of mastery of the calculation of the pH of the salt solution that is hydrolyzed quantitatively. The incomplete presence of chemical representations in learning hydrolysis of salt can have an impact on mastery of student concepts. The findings of this study are guided inquiry learning with multiple representation of 21% affecting the understanding of student concepts on salt hydrolysis material.

Based on Roziah's research [13] it was explained that student learning difficulties in salt hydrolysis material were grouped into internal and external factors. Internal factors The cause of student difficulties is the difficulty of understanding the prerequisites of salt hydrolysis, students' understanding of the hydrolysis concept that is still low, where students tend to memorize the material so that the material learned is meaningless or easily forgotten, then the interests and motivation of students are still low. . External factors The causes of student learning difficulties include the influence of peers and learning time during the day which results in students difficult to focus on learning, there are no supporting facilities for the learning process such as practicum. From the findings of researchers, efforts that can be made in overcoming student learning difficulties are to use learning methods that are varied, interesting, sustainable and systematic based on multiple representation.

Research conducted by Pujiono [6] aims to see whether social media can be used as one of the relevant learning media for generation Z through literature studies. The use of social media can benefit in the world of education through ease of access to various learning content. Through social media students can actively manage their own learning and the teacher acts as a secondary guide. Who acts as a facilitator and motivator. For generation Z who are attached to social media, the use of social media as learning media will provide different motivational values and can be a bridge of teachers and students in the digital age.

Research conducted by Huda [21] aims to find out the factors that influence chemical learning motivation in high school students who are measured using Chemistry Anxiety Questionnaire (CAQ). From research conducted by students' anxiety is a predictor that needs attention, the higher the anxiety of students, the lower the motivation to learn chemicals. Then, this research also revealed the teacher's figure to be the most decisive aspect in shaping student chemistry learning motivation. Things that teachers need to pay attention to in building chemical learning motivation for students are optimizing chemical digital literacy, creating a comfortable environment for learning and providing psychological support to students.

Research conducted by Lampropoulos [22] aims to increase teacher understanding of social media and its use as an educational media. Summarizing discoveries for a decade, social media can be used as an effective educational tool and can improve the educational process and learning outcomes. Especially with the use of social media as a creative learning medium, centered on students and actively involving students, student motivation can be increased.

Based on research conducted by Hanif [23] the frequent use of smartphones by young people causes the emergence of social media integration in learning used as mobile learning. This study found that students consider e-learning to be useful and agree with the use of social media in learning. Then, this study found a positive relationship between self -efficacy and the use of social media in education which can be interpreted that social media can be used to improve student self -efficacy.

Research conducted by Papademetriou [17] revealed that since Pandemi Covid-19 the use of social media for academic purposes has a significant role. Social media is considered an economical way to transfer material to students. The existence of social media teachers can develop more in -depth learning theories and concepts using game simulations and online case studies, social media can also encourage students to reflect material, develop theory and carry out more learning exploration.

Based on research conducted by Papademetriou [17] 80% of the academic community believes that with social media will make learning more interesting for students supported by 85% of students feel that social media plays an important role in learning motivation. With integrated learning social media can increase the intensity of students to be involved in discussions. Another squeeze of research conducted is obstacles in the use of social media, 85% of students have difficulty managing information and large workloads in participating in social media -based learning. Recommendations that can be made from the obstacles experienced are setting a more stringent program in each subject such as setting task specifications, the limit of the number of comments and posting hours. With these recommendations, information will be less and more precise, reduce workload and better time management.

Based on Sutherland's research [24] LinkedIn and Twitter are social media platforms that are more widely used for the learning process. While Instagram and Snapchat are social media platforms that are more widely used by people in everyday life. The difference in the use of social media platforms is caused by the assumption of LinkedIn as a professional platform so that it is more relevant and suitable for academics and Twitter which is used as an academic material sharing platform. Research conducted by Sutherland [24] revealed the reluctance of the use of social media as a means of assessment because it is still considered to have a lack of credibility. Social media is mostly used by academics for the delivery of material to their students but is felt to be less utilizing the two -way side.

Based on Eliyawati [25] Chemical understanding is directly related to the understanding of macroscopic, sub - microscopic and symbolic representations, as well as the appropriate relationships of the three representations. The inability of students to one level of representation will hamper the ability to solve problems for other levels of representation. Most students find it difficult to master chemical concepts, especially in microscopic and symbolic aspects. This difficulty is due to the characteristics of microscopic and symbolic aspects that are invisible and abstract. One of the efforts that can be carried out to overcome these difficulties is to analogize abstract concepts to be more tangible using teaching media. Learning media can be adapted to the learning era, such as in the current era of industrial revolution, teaching media created based on information and communication technology.

Mahzum's research [11] aims to find out the benefits of Instagram as a learning medium to increase student motivation. Based on research found 94.12 % of students are interested in Instagram as a physics learning medium, 100 % of students like to learn physics using Instagram because Instagram media is considered practical and able to develop the basic potential of students. The existence of Instagram data can develop the basic potential of students supported by 92.92% of students have high motivation to the ideals of the future. The high motivation of students is caused by an .

interesting activity in the learning process, from the research obtained data 97.05% of students agree that the material presented on Instagram makes students understand the lessons faster and avoid the atmosphere of boredom during the learning process. Through the Instagram media the learning environment feels conducive, where students can access material repeatedly so that students can more easily understand the material anywhere and anytime.

Based on research conducted by Roudotul [26] Instagram integration has the potential to improve student learning outcomes as evidenced by the high enthusiasm of students when using Instagram as a learning medium. The increase in student enthusiasm was caused by the presentation of visual elements such as images, questions, video explanations and practicum demonstrations contained in Instagram. The existence of this visual element makes an explanation easier to understand, attract students' attention and make the material feel more concrete with the real world. Instagram as a learning medium also succeeded in improving the ability of students' critical thinking with material recognition features, instructional content, presentation of real world phenomena, research videos that motivated students to find solutions to questions raised proactively.

Research conducted by Yamtinah [27] revealed that the majority of students spend 3-4 hours a day for social media with platforms that are often visited such as Instagram, Youtube and Tiktok. The purpose of students to open limited social media to find entertainment. The existence of data for the length of the use of social media students open the opportunity for teachers to utilize social media as learning media because the frequency of students who use social media as learning media is still low. Social media can be a contemporary learning media that can be accessed anytime and anywhere.

3. Material and Methods

This writing uses literature study techniques using the Systematic Literature Review (SLR) method. Based on Xiao in [28] SLR is a literature study that follows standard rules to identify and synthesize all relevant studies and provide an assessment of what is known from the topic under study. The SLR method has the following steps:

1. Identify

2. Evaluate

3. Interpret the results of the literature study used to answer the research questions given.

The SLR method in this study was carried out by finding scientific publications using online article databases. In this study the data used includes the keyword Learning Chemistry using social media. After searching for keywords, researchers read the title and abstract articles to select articles that meet the following requirements:

1. Articles on making social media -based learning content

2. Articles about multiple representations in learning chemistry

3. Articles on Increasing Student Learning Motivation

4. Year Range of Journal 2019 - 2023 (Last 5 Years)

After going through the filtering process, 20 journals with journals were obtained from 8 Google Scholar and 12 journals were obtained from Eric (Table 1).

Table 1. Filtering process from Google Scholar and Eric.

Authors	Selected Journal	Database
(Widarti,2023)	The Use of Integrated Learning Media of Tiktok and Instagram Social Media on Student Learning Motivation on Cation Qualitative Analysis Materials Groups I and II	Google Scholar
(Alenezi, 2022)	The Use of Social Media as a Tool for Learning : Perspectives of Students in the Faculty Education at Kuwait University	ERIC
(Chukwuere, 2021)	Understanding the Impacts of Social Media Platforms on Students Academic Learning Progress	ERIC
(Papademetriou, 2022)	COVID-19 Pandemic : The Impact of The Social Media Technology on Higher Education	ERIC
(Erdogdu, 2023)	Social Network Usage Related to Science Learning Approaches : Instagram	ERIC
(Ramazanoglu, 2021)	An Investigation of Pre-Service Teachers Motives for Using Instagram	ERIC
(Nursakinah, 2023)	The Development of FunLabs Android Based Application Using Unity Software as Learning Media to Explore Students Motivation on Acid, Base and Salt Topic	ERIC
(Iriani, 2023)	Development of Podcast Tik Tok Learning Media to Improve Kayuh Baimbai's Character on Salt Hydrolysis Material	Google Scholar
(Albanani, 2020)	Pengaruh Penerapan Pembelajaran Inkuiri Terbimbing Bermuatan Multiple Representasi Terhadap Pemahaman Konsep Siswa SMA	Google Scholar
(Roziah, 2022)	Analisis Kesulitan Belajar Kimia pada Materi Hidrolisis Garam terhadap Peserta Didik di SMA Jam'iyah Islamiyah	Google Scholar
(Pujiono, 2021)	Media Sosial sebagai Media Pembelajaran bagi Generasi Z	Google Scholar
(Huda, 2023)	The Factors That Influence The Motivation to Learn Chemistry of Upper Secondary School Students in Indonesia	ERIC
(Lampropoulos,2021)	A 10-Year Longitudinal Study of Social Media Use in Education	ERIC
(Hanif, 2022)	When Technology Based Learning is The Only Option : Evaluating Perceived Usefulness of Social Media	ERIC
(Papademitriou, 2022)	Covid-19 Pandemic : The Impact of The Social Media Technology on Higher Education	ERIC
(Sutherland, 2020)	Academic Perspective and Approaches to Social Media Use in Higher Education : A Pilot Study	ERIC
(Eliyawati, 2020)	Smartchem : Aplikasi Android untuk Belajar Berganda Representasi Kimia Asam Basa	ERIC
(Mahzum, 2020)	The Use of Social Media Instagram as Instructional Media for Physics Toward Student's Learning Motivation	Google Scholar
(Rose, 2023)	The Effects of Instagram Media with Inquiry on Critical Thinking Skills in The Topic Reaction Rates	Google Scholar
(Yamtinah, 2023)	Chemistry Learning Media Based on Social Media : Student's View	Google Scholar

4. Conclusions

Based on the literature review that has been carried out it can be concluded that research on social media as a learning medium for hydrolysis of salt -based multiple representation can be done with various considerations of previous research results that use social media such as Instagram, Tiktok and Twitter as learning media that are proven effective in increasing student motivation. Reviewing previous research, no one has used social media as a learning medium that has raised material regarding salt hydrolysis. Therefore, further research is needed regarding the development of social media-based learning media on salt hydrolysis material.

Content creation needs to consider building a learning atmosphere that is interesting and not monotonous and is able to present three levels of chemical representation so that it can build student learning motivation. Literature studies that have been carried out show the potential of social media as chemistry learning media that can increase student learning motivation. One social media that has the potential as a chemistry learning media, namely Instagram. Seeing the potential of Instagram as a learning medium and the gaps in social media-based learning media research on salt hydrolysis material, further research can be carried out on Instagram as a learning medium to increase student learning motivation.

Author Contributions

The author's contribution is to provide direction about the journal quoted to be a basic literature. Then the authors contribute to writing articles and provide new interpretations of each reference in the article to be used as a research foundation.

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