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Learning Innovation Content Creators Social Media-Based Qualitative Analysis to Improve Motivation and Learning Outcomes of Professional Teacher Candidates: A Systematic Literature Review

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Students need motivation in order to increase their interest and focus of students. One way to increase students' learning motivation is by presenting interesting learning media for students. Social media is an audio-visual platform that steals the attention of many people in various groups, especially children to teenagers. The method applied in this research is the systematic literature review (SLR) method. The SLR method is used to identify, review, evaluate and interpret all available studies in a subject area of interest to a phenomenon involving a particular related research question. In the Literature Review Study that has been described, it can be concluded that research on Creator Content in Social Media-Based Chemistry Learning Media can be carried out with various considerations of research results similar to the Multi-representation approach which can increase student motivation and learning outcomes.

Graphical abstract



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1. Introduction

Based on research by [1] effective interaction is a prerequisite for the quality of learning. The role of the teacher has very important in improving the quality of learning because the teacher regulates the approaches, methods,

strategies, and learning media that will be used, but what is equally important is the condition of students who are the main priority because students are subjects as well as objects of education.

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Students need the motivation to be able to take part in more interesting and more focused learning. The learning motivation of students can increase the activeness and direct involvement of students during the learning process. There are many ways that can be done by teachers to foster student learning motivation, namely by providing encouragement, enthusiasm, understanding, and presenting interesting learning media for students.

According to [2] state that learning media is a tool that can help the teaching and learning process so that the meaning of the message conveyed becomes clearer and the goals of education or learning can be achieved effectively and efficiently. Learning media can be used by students as a source of information related to learning materials provided by teachers. The role of this learning media is of course very important to support learning, especially when the learning is held online during a pandemic.

Since the Covid-19 Pandemic in distance learning, students tend to be less motivated in learning, it can be seen from student participation and student involvement in learning materials. Therefore, we need a learning media that can increase students' learning motivation which is more frequently accessed and used by students and is familiar with students' social situations so that students do not feel foreign and bored when participating in learning.

The development of the era of globalization brings many innovations in the field of science and technology which in this 4.0 technology era can be integrated. A science that utilizes digital technology as a breakthrough in increasing student learning motivation in the world of education.

Social media is a group of internet-based applications that are built on the ideological and technological foundations of Web 2.0 that allow the creation of user-generated content exchange. With social media, users can communicate with each other without being limited by space. It means that the use of social media has been very flexible and easy, this of course can allow students to learn if social media can be used as an interesting learning media.

As the background described above, it will be very important to conduct research. The author is interested in the research entitled "Development of Content Creator With Social Media Based Chemistry Learning Media to Increase Students Learning Motivation.

2. Results and Discussion

Based on research conducted by [3] on the use of social media on Facebook studied the effect of using Facebook on students' learning experience in a defined instructional design framework used to compare students' learning experiences using Moodle as a control group. The lack of interaction in online learning is a new phenomenon that requires breakthrough solutions. One alternative to encourage students to acquire skills in the 21st century is the assimilation of experiential knowledge through the use of social networking sites. The study states that Facebook can have a significant effect on student performance. Studies show that Facebook has the opportunity to support the teaching and learning process. Facebook makes learning flexible without making students lose the learning experience. Using Facebook as a learning communication medium can increase student participation in online classes and increase student interest in learning.

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media on Facebook studied the effect of using Facebook on students' learning experience in a defined instructional design framework used to compare students' learning experiences using Moodle as a control group. The lack of interaction in online learning is a new phenomenon that requires breakthrough solutions. One alternative to encourage students to acquire skills in the 21st century is the assimilation of experiential knowledge through the use of social networking sites. The study states that Facebook can have a significant effect on student performance. Studies show that Facebook has the opportunity to support the teaching and learning process. Facebook makes learning flexible without making students lose the learning experience. Using Facebook as a learning communication medium can increase student participation in online classes and increase student interest in learning.

In the research conducted by [4] the pedagogical approach with twitter-based learning in high school students. This study also examines how teachers can use social media to encourage increased student participation and digital literacy. According to the researcher, social media considered to have a greater need to be integrated with teaching practice. In the literature review, social media considered a means of opening big changes to transform from classical teaching and learning practices to more flexible, collaborative, and interactive learning. Social media will also serve to liaise academic institutions with a new generation of students to build knowledge through exploration of a broad the network of learning and social interaction. Several studies conducted at a higher level emphasize that when Facebook used for formal education it opens up opportunities for colleagues to provide feedback, communicate, discuss learning and facilitate collaboration and knowledge construction of students through social interaction.

Based on research by [4] state that this study focuses on the use of Twitter for different purposes of class mastery which include discussion in class, student involvement in subject matter, developing student interaction, and increasing student attendance. The use of social media and twitter must be following by the objectives of classroom mastery. Twitter can help teachers in classroom mastery because of its features can support communication and information sharing. Twitter can also used as a pioneering platform for the educational community. This certainly opens up the possibility of using creator content in chemistry learning to improve student learning outcomes and motivation because the social media users such as Twitter in this study provide many facilities for communicating and exchanging ideas as well as a place for students to gather that is not limited by space and is more flexible.

In the research conducted by [5] shows that in this study, the use of innovative chemistry laboratory workbook learning integrated with a series of computer-aided projects is very appropriate to motivate students to study independently for improving their knowledge and skills in the field of chemistry. This, of course, can be the basis for researchers to use social media which is also integrated with students' smartphones which are expected to be more flexible and motivate students to study chemistry.

In the study by [5] said that There are several scenarios made in this study, first is a direct student response system that is used to collect feedback and questions from students and display analysis through smart devices that detect and record movement and student physiological status and get immediate feedback so that teachers know the extent to

which students have met the learning objectives.

According to [5] In the second scenario known as self-feedback the teacher uses wireless *earphones* and other notification devices to send self-feedback during the teaching and learning process. This study explains that it is the teacher's responsibility to integrate technology into the education system for problem-solving and students' critical thinking skills

The third scenario is multilingual communication, namely teaching students with multilingual methods in the same class using a wireless electronic translation device to translate information and enable students from different cultures and languages to understand the subjects presented without mistranslation. Teachers and students will see and hear the subjects presented in their own language. Enable students to work in similar situations to achieve learning objectives successfully. Teachers can answer questions without having to face communication barriers.

In research literacy studies [5] stated that millennials have digital abilities along with the times, which is a new challenge for a teacher. To overcome these challenges, a 2013 curriculum was prepared to meet the requirements of industry 4.0. Learning innovation is very appropriate to make it easier for students to learn optimally, improve learning memory, and make learning more effective and efficient. The research procedure is syllabus analysis, chemistry laboratory workbook analysis, workbook design and development, implementation, evaluation, and data analysis as summarized.

In this study, a comparison method is used between the control group and the experimental group which it was given treatment using learning media as the object study. Then pre-test was given to both classes to find out the basic knowledge of the two class was the same as the dependent variable. Then teacher using validated learning media to teach, and at the end of the lesson, a post-test was given to see changes in student learning outcomes. To measure the student motivation, a motivation questionnaire was given to students.

In the study by [5] it was found that the InoChemLaw learning media can build students' abilities in an investigation, and it is integrated with computer technology, so that it is easy to attract students' interest to study independently. Expert standardization shows that the InoChemLaW package meets the BSNP requirements for high school. The research is suggested that each student interacts with others using the internet during the teaching and learning process. In other words, universities and higher education must find solutions for new and innovative computer technology developments. It is very relevant to the research that will be carried out, namely the development of creator content in chemistry learning with a multi-representation approach.

Based on research by [6] Cellular phone technology should be applied in the world of education. Procurement of software linked to cellular phones is a platform that is needed, one of which is in the field of chemistry. A new game-based application designed for handheld devices and portable devices with controlled touch screen technology. In this application, there is a scoring feature that tracks progress, and the scores obtained by students connect to other users via social media. This is an interesting innovation for research to be carried out regarding the use of creator content in social media-based chemistry learning. The operation of the system which aims to help strengthen the important chemical concepts required for introduction to chemistry needs to be added to the researcher's research

From the literature review [6] stated that game products are made to offer an interesting and fun learning atmosphere that can encourage learning and improvement. Games and electronic applications have great potential for teaching and learning the basic concepts of chemistry, especially if chemists and game designers involved from the start it will be interesting to see how these systems are further developing in the future. It can be used as the basis for research by researchers who take part in electronic applications, namely social media and designers, or in the context of research to be carried out, namely creator content as a chemistry learning medium developed with a multi-representation approach.

In the research conducted [7] explained that the difference in learning chemistry is based on the fact that most of the studied of chemistry is only dominated by the content approach. In order to be successful in studying chemistry, it is necessary to have a complete understanding of the three levels of representation which include macroscopic, sub-microscopic, and symbolic language. An approach that is able to integrate the three Chemical level representation is required to form a comprehensive understanding. The level of students' ability to understand chemistry was still low due to the lack of representation of chemistry in microscopic and sub-microscopic forms in its visualization. Therefore, continue research is needed on chemistry learning with a multi-representation approach that represents chemistry with three images, namely macroscopic, microscopic and sub-microscopic, in the learning media used in learning for subsequent research.

In the study by [7] explain that the sub-microscopic stage is a difficult part to be developed because of its abstract and invisible nature, so teachers need tools to help visualize this level. Unfortunately, there is a gap between the three levels which makes it difficult for students to learn chemistry. Therefore, in this research, researchers will use creator content in social media-based chemistry learning media with a multi-representation approach.

In addition, another problem raised in this study, namely the difficulty of students in studying chemistry is the gap between students' real life and what taught in chemistry class. Students every day encounter real-world phenomena through their five senses, but when in chemistry class, learning class explains more about sub-microscopic chemistry and formulas as a result, many students find it difficult to learn chemistry.

The purpose of this study is to determine the feasibility of e-Module according to the experts; (b) to assign the effectiveness of the e-Module on students' critical thinking skills; (c) to know students' responses to the e-Module. Based on the results of the study, it concluded that (a) the e-Module met the criteria of Very Good in terms of material content with an average value of 3.79 by chemists, while in terms of the e-module media developed met the criteria of Very Good in terms of multimedia according to multimedia experts; (b) e-Module proved to be effective in developing students' critical thinking skills significantly (c) Student responses to e-Module got an average score of 3.64 which included in the magnificent category. From these results, research on the development of social media-based chemistry learning content creators with a multicultural approach is very crucial to do ([7]).

In the research conducted by [8] states that chemical concepts can be understood in their entirety if they can connect macroscopic, microscopic, and symbolic aspects or referred to as multi representations packaged in social media-

based content creator learning media in the research that the researcher will do. IMF macroscopic representations relate to the form of substances in liquid or solid form, symbolic representations describe the chemical formulas of the constituent particles, and microscopic representation describes the interactions that occur between the constituent particles of matter. It can be the basis for the development of content creators in social media-based chemistry learning with a multi-representation approach. The problem discussed in this study is that students can write chemical formulas, the particles that structure of molecules but cannot explain the process of interaction between these particles.

It is possible to explain the microscopic aspects in writing and words, but this has potential to cause misunderstandings in the interpretation of chemistry. In addition, the use of textbooks also causes the formation of the assumption that chemistry is an abstract suit and cannot be described with a clear visualization. That is a problem with the same background as the research to be carried out

In research by [8] have developed e-modules by adding text, audio, animation, photo or image features, and sound with different combinations in elementary thematic learning and the results obtained show that students are more motivated to learn and their learning achievement increases. That has been testing at the elementary school level, but there has been no testing in high school. The use of e-books can improve academic ability, flexibility, and effectiveness in learning compared to students who learn to use printed books. This certainly strengthens the background of the research that the researcher will do.

This research aims to develop a multi-representation-based e-book on the concept of intermolecular forces that is valid and feasible to use. The research form used is Research and Development (R&D), which refers to the ADDIE development model consisting of five stages: analysis, design, development, implementation, and evaluation. Data collection tools for analysis divided into the interview stage and the observation sheet. The results showed that the developed E-book was valid and suitable for use in the learning process. Can facilitate students in learning the concept of intermolecular forces.

In research that will be carried out using content creator in multi-representation-based chemistry learning media on qualitative analysis of group I and II cations, that require an observation stage that showing macroscopic forms such as colour of solution, microscopic solutions, namely reaction equations and sub-microscopic includes reactions that occur between molecules such as the material raised. In this study, the results show that the learning with a multi-representation approach can facilitate for students.

This exploratory study examines the characteristics of a Twitter-based professional learning community. The problems raised in this study are (i) the professional nature of teachers with a twitter-based learning community and (ii) the characteristics of a twitter-based learning community. The characteristics of the learning community in its analysis should consider the development of future online professional experiences.

According to [9] teachers who use various social media sites such as Twitter, Facebook, and YouTube to post and exchange pictures, resources, and information, have a learning community on these social media. The purpose of this study is to examine social media as a form of contemporary media from teachers. Teachers as content creators strive to develop their learning and practice in order

to increase students' understanding of using social media. Social media can overcome some of the teacher's barriers.

In addition [9] his findings indicate that the development of social media as a learning medium can overcome challenges related to teacher learning and improve the quality of teaching, which will have an impact to improving student learning outcomes. This strengthens the background of researchers in researching creative content learning innovations as a social media-based chemistry learning medium.

According to [10] shows the role of social media as a learning technology for students and highlights their problems related to its use. This study shows that social media have an important role in process of learning technology. Its use encourages virtual interaction opportunities among students, and instant access to many, of the latest, reliable, and students preferred learning resources

Social media includes websites and related tools that facilitate the connectivity and interaction between users. Communication and interaction are at the core of any instructional program; Meanwhile, social media has emerged with great potential to improve communication and interaction in the teaching and learning process [10]

Based on research by [9] The use of virtual classrooms and social media and the presence of an online databases have made it possible to connect various stakeholders in chemistry education with large amounts of knowledge and information and increase their ability to engage in learning assessments in real-time.

According to [11], the new technologies available now are easier to integrate into teaching and allow students to have opportunities to learn with hands-on practice, receive feedback, continually refine student understanding, and build new knowledge. This technology can also help students to visual concepts that are difficult to understand. With the availability of advanced technology, chemistry education will be more widespread than traditional methods. Traditional teaching centered on the teacher as a source of information assisted by textbooks.

If used appropriately, technology can increase students' knowledge of chemistry content and develop students' skills in chemical disciplines. That is the basis for research on the developing content creators for chemistry learning. The problems discussed in this study are regarding conceptual understanding, namely the use of technology to student knowledge and conceptual understanding and the approach used with technology to improve student learning both inside and outside the classroom. It seems that using a combination of approaches such as text, images, videos, and physical or computer-based models in addition to lectures and traditional paper-based assignments is less effective when compared to using technology to increase students' learning motivation.

In the research conducted by [12] said that the effectiveness of multi-representation-based worksheets in improving students' metacognition skills in static electricity. Although teachers in learning have used worksheets, these worksheets were obtained from the market and were not adapted to the characteristics and learning objectives of students. This causes students to continue to experience difficulties in achieving learning objectives. In this case, a multi-representation approach is applied in learning has three main functions, namely: as a complement, limiting interpretation, and building understanding.

According to [12] states that the role of multi-representation is at the core of the science learning process. It is convincing for research using a multi-representational approach to chemistry learning. In addition, the explanation of the material using a representation approach does not fully describe the meaning of a material. This study uses a pretest and quasi-experimental posttest design. These results indicate that learning using worksheets with a multi-representation approach is more effective in improving metacognitive skills. In this research suggest to use other approaches to vary.

In addition, [13] wrote that technology and social media have provided quality tools for adult learners to learn and progress continuously. Rapid technological advances have enabled the development of technologies used for learning. The expansion of various tools has provided professors, educators, trainers, and instructors, with many alternatives to the application of supported technologies in education.

The use of social media can improve adult learning outcomes and academic achievement. Social media is increasingly proving useful in adult learning and has good potential for adult education. This study highlights some of the benefits of social media for adult learners.

The context of online, mixed, or face-to-face learning, you can apply the use of technology to optimize teacher and student engagement in cooperative and collaborative learning even though they are separated in space and time. Social media is a platform that provides social connectivity in our daily lives. Content characteristics have changed to a more dynamic state, with higher participation rates [13]

Social media can facilitate the development of online communities, enabling collaborative and participatory engagement by emphasizing collective knowledge and social interaction. Like the concept of lifelong learning, Adult learners will need information in a variety of formats, designed to suit specific educational goals to suit different learning styles and preferences, and to fill student gaps over time.

In the study by [14] write the term 'Social media' refers to the use of online tools created for the exchange of social communication between users. The exponential increase in social media (SoMe) has reorganized the way people interact with one another. The use of SoMe in health education is still in its infancy. The purpose of this review is to examine the use of SoMe by healthcare students, professionals, and educators to ascertain whether the use of SoMe enhances experiential learning. The results of the literature review provide an analysis of the use of SoMe in health education. SoMe is an excellent educational resource that can give you an advantage in education.

Research and further education of SoMe in health education are very important for educators, students, and practitioners. In this review, it is recommended to conduct further research related to the use of social media, which in line with the research to be carried out, namely the development of content for chemistry learning creators based on social media. (Scott & Goode, 2020)

According to [15] The start of the COVID-19 pandemic in Spring 2020, chemistry faculties are rapidly changing. The problems discussed in this study include the disadvantages of online learning and the effect of distance learning on the level of student self-study motivation. Adaptability, organizational skills, and self-awareness are student characteristics that must be strengthened to make students successful as online

learners. The factors that affect online learning are time and distractions outside the scope of learning, student motivation, student participation, and external factors.

According to the student's point of view, adapting to the pandemic atmosphere and distance learning during a pandemic is something to worry about. Students learning motivation changes dynamically depending on the student's learning situation as well as changes in the learning environment depending on many factors, including the motivation of their classmates, their personalities, and their characteristics. For this reason, before conducting research, the research team should make a preliminary study of student learning needs so that they can adjust the learning media that will be made to the needs and characteristics of students in general.

According to [16] the current trend in collaborating technology in education is the reverse classroom model that changes the learning process. Reverse classes are often synonymous with using video to replace conventional classroom lectures. Then various software can be used to edit videos, such as Screencast-O-Matic, Movie Maker, and Educreations. This list of software can be used as a reference for researchers in creating learning media for creators based on social media.

After the learning video is made, the teacher as a content creator can share it with students through various platforms such as email and social media. In this case, the researcher will use the TikTok and Instagram applications to distribute videos that have been made and validated. Learning models using social media accelerate the adaptation process in the world of education by applying them to online, hybrid, and collaborative learning.

According to [16] reported that students do not routinely watch assigned videos outside of class due to a lack of instructions from their instructors. With quizzes to motivate and challenge students to watch videos at home. It can be used as input for researchers to provide quizzes as an alternative step to increase students' motivation to learn at home.

Based on research by [17] this study aims to examine the factors that explain academic success in a gamified online learning environment, taking into account the emotional involvement and motivation of student. Meta-concepts consist of three dimensions: behavior, cognitive, and emotion. This study focuses on the effect of students' emotional conditions on learning outcomes and motivation.

Motivation is defined as taking action to do or complete something and has a significant impact on success and performance. According to this model, motivated individuals need to pay attention to are following things: student attention needs to focus on learning, and learning arrangements must be entertaining and give a valuable impression [17]

Therefore, before conducting research according to the literature review, it is necessary to conduct a preliminary study of students who needs a pleasant learning atmosphere. Given this advice, the design process begins with an examination of the weekly lesson plans and learning assignments, and the activities and number of weeks required for their completion are determined.

According to [18] wrote that in the last few years there have been quite large changes in the world of education, especially in learning with a reverse pedagogical approach which provides space for freedom for students in learning to

provide a sense of comfort to students and assisted by teachers and peers through a platform that improved online technology.

Educational games have the potential to provide high-quality, inexpensive, flexible, portable, and relaxing educational services, which can increase the interaction between learning materials, students, and teachers. Learning outcomes, in this study, students were able to have academic achievement, problem-solving skills, critical thinking, knowledge, learning efficiency, skills, and attitudes acquired through game-based learning [18]

Recent studies on educational game-based learning can motivate students, in this study could be generalized to other contexts, where designers and teachers can make another effort to improve learning outcomes, student motivation, engagement, and sitting satisfaction in game-based learning. The follow-up to the literature review in this research is the development that focuses on content creators based on social media which is expected to increase student motivation and learning outcomes.

According to [19] the traditional teaching method relies solely on the use of textbooks, but the assessment method has shown that the majority of students taught by this method do not absorb the course content to the expected level. It also makes the basis for developing social media-based content creators so that interactions between students and teachers are more interactive.

The advantages of traditional learning and categorizes the advantages of non-traditional or modern learning. The resulting analysis in practical guidelines, including benefits of five non-traditional learning and learned methods (reverse classroom, gamification, case studies, self-study, and social media) belongs to four categories: technical professional, personal skills/abilities, personal attitudes, and time and space.

Based on the results, the authors set significant guidelines for instructors aimed to optimize learner achievement by adopting the most effective teaching style, based on course brand objectives and learner abilities. Traditional educational methods are based on instructors explaining topics in textbooks. Non-traditional learning methods, on the contrary, put more pressure on students to arouse curiosity and creativity and motivate them to participate in-class activities. It will be adopted in the development of our content creator, which is to arouse students' motivation and curiosity.

According to [19] in non-traditional learning that utilizes technology and social networks, with social media applications, students can share information with other students and adapt quickly to new forms of communication and learning by using new media, such as blogging, text messaging, googling, social networking, and playing games.

Many benefits can be obtained from the application of social media-based education, including increased student involvement in the learning process, improving critical thinking skills, training students in independent learning, teachers can control students independently, and their progress occurs with a platform that can be used by students to interact with teachers and create a fun and interactive learning environment.

In the research conducted by [20] conducting research that examines the impact of cooperative learning on students' learning motivation. Cooperative learning is a teaching method in which small groups of students will be able to support each other to understand the lesson. The five

components of cooperative learning are positive cooperation, type of interaction, individual responsibility, developing interpersonal and social skills, and quality of group performance.

This study also explains that cooperative learning can improve student academic results, relational skills, and mindset. The learning outcomes of students who applied cooperative learning showed a significantly higher level of learning motivation in the experimental group compared to the control group. Implications for innovation in teaching methods and further research is suggested to further popularizing cooperative learning for better learning outcomes.

It can be adopted in research that will be carried out by promoting cooperative learning in the development of creator content on social media-based chemistry learning media. This study has proven that collaborative interactions often occur between students to strengthen students' mutual collaboration for better learning motives.

3. Material and Methods

This study aims to identify platforms and methodologies for developing information systems. The method applied in this research is the systematic literature review (SLR) method. The SLR method is used to identify, review, evaluate and interpret all available studies in a subject area of interest to a phenomenon involving a particular related research question.

The method of writing a review journal uses a systematic search of library data. The Systematic Literature Review (SLR) method is a method that has the following steps:

1. identify,
2. evaluate,
3. interpreting the results of the literature study used to answer the given research questions

Systematic review and identification of journals can be carried out using the SLR method following the stages or protocols specified in each process. In this study, the data used included keywords as content creators of social media-based chemistry learning. After searching for keywords, the researcher reads the title and abstract of the article to select articles that meet the following inclusion criteria: (1) Articles about content creators of social media-based chemistry learning; (2) The range of the year the journal is published is from 2018-2022 (last 5 years); (3) Publication of reputable, accredited, and full-text articles.

This study has exclusion criteria, namely research journals with problem topics that do not relate to the content of creators of social media-based chemistry learning in chemistry learning as well as previously published journals 2018. After the screening process, the results of data extraction will be known with certainty the amounts of initial data that meet the requirements to be analyzed and studied in more detail. Furthermore, the data obtained are paraphrased again the results from the articles that have been obtained and presented in this article. The search results found 20 journals related to the topic under study (Table 1). Then re-selection based on the inclusion criteria obtained from 9 journals. Furthermore, the data was sorted by assessing and considering the suitability of research topics, abstracts, and research content so that 20 journals were obtained consisting of 6 journals obtained from the Scholar database, 10 journals obtained from the Scopus database, and 3 journals from ERIC, and 1 published journal, from ScienceDirect which has met all

the requirements. The inclusion criteria can be seen in the Table 2.

Table 1. Selection of articles and journals.

Authors	Selected Journal	Database
(Nainggolan, Hutabarat, Situmorang, & ..., 2020)	Developing Innovative Chemistry Laboratory Workbook Integrated with Project-based Learning and Character-based Chemistry (Q1)	Eric
(Hussain et al., 2018a)	Social Media as a Learning Technology for University Students	Eric
(Widarti, 2021)	How Does the Rasch Model Justify Multiple Choice Question Items as a Measure of Student Understanding of Acid-Base Material at the Submicroscopic Level?	Scopus
(Fibonacci et al., 2021)	Development of chemistry e-module flip pages based on chemistry triplet representation and unity of sciences for online learning	Scopus
(Jones et al., 2018)	Chirality-2: Development of a Multilevel Mobile Gaming App to Support the Teaching of Introductory Undergraduate-Level Organic Chemistry	Scopus
(Gupta & Belford, 2019)	Conclusion: Technology Integration in Chemistry Education and Research: What Did We Learn and What Can We Expect Going Forward?	Scopus
(Tran, 2019)	Does Cooperative Learning Increase Students' Motivation in Learning?	ERIC
(Safapour et al., 2019)	A review of nontraditional teaching methods: Flipped classroom, gamification, case study, self-learning, and social media	Scopus
(Yu et al., 2021)	The effect of educational games on learning outcomes, student motivation, engagement and satisfaction	Scopus
(Özhan & Kocadere, 2020)	The effects of flow, emotional engagement, and motivation on success in a gamified online learning environment	Scopus
(Zainuddin, 2018)	Students' learning performance and perceived motivation in gamified flipped-class instruction	Scopus
(Kalman et al., 2020)	Student views of the online learning process during the COVID-19 pandemic: A comparison of upper-level and entry-level undergraduate perspectives	Scopus
(Ye et al., 2020)	Turning information dissipation into dissemination: Instagram as a communication enhancing tool during the covid-19 pandemic and beyond	Scopus
(Yanti et al., 2019a)	The effectiveness of students' worksheets based on multi-representation in improving students' metacognition skills in static electricity	Scholar
(Rasmawan, 2020)	Development of multi-representation based electronic book on inter molecular forces (IMFs) concept for prospective chemistry teachers	Scholar
(Gleason & Manca, 2020)	Curriculum and instruction: pedagogical approaches to teaching and learning with Twitter in higher education	Scholar
(Goodyear et al., 2019)	Social media and teacher professional learning communities	Scholar
(Hussain et al., 2018a)	Social Media as a Learning Technology for University Students.	Scholar
(Alsaadat, 2018a)	The Impact of Social Media Technologies on Adult Learning.	IJEC
(Scott, 2020)	The use of social media (some) as a learning tool in healthcare education: An integrative review of the literature	ScienceDirect

This section should describe the experimental methods used in the work in sufficient detail to allow repetition of the work by others. Authors are encouraged to include detailed experimental data such as experimental

procedures and characterization data as Additional Material rather than as an extensive experimental section.

Table 2. Criteria for journal Inclusion.

Author	Selected Journal	Databases
(Goodyear et al., 2019)	Social media and teacher professional learning communities	Scholar
(Hussain et al., 2018b)	Social media as a learning technology for university students	ERIC
(Alsaadat, 2018b)	The impact of social media technologies on adult learning	IJEC
(Scott & Goode, 2020)	The use of social media (some) as a learning tool in healthcare education: An integrative review of the literature	ScienceDirect
(Safapour et al., 2019)	A review of nontraditional teaching methods: Flipped classroom, gamification, case study, self-learning, and social media	Scopus
(Ye et al., 2020)	Turning information dissipation into dissemination: Instagram as a communication enhancing tool during the covid-19 pandemic and beyond	Scopus
(Gleason & Manca, 2020)	Curriculum and instruction: pedagogical approaches to teaching and learning with Twitter in higher education	Scholar
(Yanti et al., 2019b)	The effectiveness of students' worksheets based on multi-representation in improving students' metacognition skills in static electricity	Scholar
(Fibonacci et al., 2021)	Development of chemistry e-module flip pages based on chemistry triplet representation and unity of sciences for online learning	Scopus

4. Conclusions

In the Literature Review Study, which has been described, it can be concluded that research on Content Creator as Chemistry Learning Media with Social Media-Based can be carried out with various considerations of similar research results that utilize social media such as Twitter and Facebook which are still text-based in their application as a learning tool that has proven to be effective. which can increase students' motivation and learning outcomes.

However, previous research only emphasized the utility of social media as a good communication platform for students and teachers, and research that focuses on content creators has not been studied further. Then some notes need to be considered in developing creator content such as building a fun and not monotonous learning atmosphere before implementing learning media to motivate students to make optimal use of learning media.

In the Literature Review Study is recommended to teachers also have to build good interpersonal relationships. In addition, to control student activities in using learning media, quizzes can be given to students as assignments at home. For the visualization of the material, the content creator must use a multi-representation approach to overcome the abstractions that exist in chemistry to make it easier to understand.

Author Contributions

The contribution of the first author is to provide direction regarding the limitations of the cited journals to be used as literature to use as basis. The second author's contribution is writing articles and providing new interpretations of every reference in the article to use as a research basis. The third author's contribution is correcting the contents of the article and making improvements to the format as well as making publications. The fourth author's contribution is controlling the writing of articles so that they comply with the guidelines for writing good and correct papers.

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