

The Application of Instagram Social Media to Qualitative Analysis Materials for Groups I and II to Increase Student Interest in Learning

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Abstract: This study aims to determine the effectiveness of the application of Instagram media on students' interest in learning group I and II cation analysis materials. The data collection method used qualitative analysis with a descriptive approach. The results of the media validation get an average score of 84.27%, so the media is very feasible to be used in this study. Respondents in this study were students who followed the @kimiafun2022 Instagram account and interacted in answering questions and responses on Instagram. The study results show that the Instagram application can effectively increase student interest in learning about group I and II cation analysis materials, which is considered problematic.

Keywords: Instagram; Cation analysis; Interest in learning

Introduction

Social media is no stranger to today's society. In this 4.0 era, many social media have emerged that can be used by high school and college students to learn. Social media can help humans in various aspects of their needs for entertainment, education, health, self-expression, communication and others (Manampiring, 2015). The popularity of social media dramatically impacts students, and they will spend more time using social media either through their laptops or mobile phones (Sesriyani et al., 2019).

So far, people have always judged social media from the negative side, even though the positive impacts of using social media also vary. The positive impact of social media is that they can quickly receive information about the world and interact with friends and new people worldwide (Sesriyani et al., 2019). In addition, in education, social media has begun to be widely developed by educators at the school and university

levels. Students can use social media to increase knowledge and information. With social media, the learning process between students and lecturers can be carried out even though both are in different places (Milman, 2015). Social media's growing development influences students academically, and educators make it an alternative learning media (Sesriyani et al., 2019).

Social media Instagram is a social media that is in great demand by the public, especially teenagers. Indonesia is a country that ranks 4th in the highest use of Instagram in the world, namely 91.77 million people as of July 2021, with the most users being dominated by school-age teenagers, which is 36.4% (Databoks, 2021). Instagram is a photo-sharing service application that allows them to take selfies and share them on social networks, including their personal Instagram (Rubiyati et al., 2017). Another study also proven that students taught Instagram-assisted creative learning were higher than those taught problem-based learning (Salehudin,

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2019). This shows that through the media, Instagram can be used for learning at school and college.

Instagram social media was the second most widely used social media by students, which was 98%. In addition, Instagram social media is also social media that ranks second for applications that are used every day after WhatsApp, with an Instagram percentage of 80.4% (Andriani et al., 2022). Instagram can be used as an exciting learning media with various advantages, such as the infographic section of the Instagram feed, which can provide an integrated display of images, videos, and data graphics that are not owned by other social media (Veygid et al., 2020). Instagram also has a positive impact, namely that it can be used as a fun learning medium that has yet to be often applied. So far, the low student learning outcomes are due to the lack of learning media that students enjoy that can facilitate their learning without a burden (Putra et al., 2020).

Instagram is easily used by iPhone, iPad, and iPad Touch with the IOS 7.0 operating system or the latest version, Android with the operating system 2.2 (Froyo) and above, and Windows Phone 8. The application can be downloaded via the Apple Apps Store and Google Play. The features that support the Instagram application spoil its users, such as cameras, editing, feeds, Instagram stories, live on Instagram, Direct messages and IGTV or what is commonly called reels (Fujiawati et al., 2021).

Chemistry is a branch of science that can be said to be a product because there are facts, concepts, principles, laws, theories and findings of scientists; apart from that, chemistry is also a branch of chemistry as a scientific work process (Widarti et al., 2021). One branch of chemistry is analytical chemistry which studies the analysis of group I and II cations. The concepts discussed in analytical chemistry are mainly abstract and involve complex mathematical calculations (Fardani et al., 2017). The qualitative analysis studies the presence of an element or compound in the sample. The results of observations made by analytical chemistry teachers at SMKN 7 Malang in 2020 revealed that qualitative analytical chemistry is one of the problematic materials to teach (Widarti et al., 2022). In another study at Bhakti Mulia Vocational High School Wonogiri, as many as 30 students were given analytical chemistry learning outcomes questionnaire, and there were 53.33% stated that qualitative analysis material was challenging to understand (Fathonah et al., 2015).

Therefore, this is a consideration for choosing Instagram social media to gain knowledge, especially on the group I and II cation analysis materials. Analytical chemistry requires accurate visualization so that educators can effectively convey their message to the audience, especially in group I and II cation analysis materials. Cation analysis material is easier to understand if it is described and visualized correctly.

Cation analysis material can be visualized using simulative multimedia so that students can easily understand the material (Rani et al., 2015). The virtual laboratory is one of the practical learning innovations that can be developed based on information technology (Widarti et al., 2022). This study aimed to determine students' interest in studying cation analysis material for groups I and II through social media Instagram (infographic feeds).

Method

This study uses a case study research method with a qualitative descriptive approach (Sugiyono, 2014). According to Rokhim et al. (2021), survey research involves individuals answering questions in predetermined instruments such as interviews, tests, or questionnaires. Therefore, qualitative data was obtained from respondents' responses to the results of making infographics on Instagram Stories and the @kimiafun2022 feed, where the respondents came from students. The data collection procedure was carried out using the data obtained and analyzed using descriptive statistical techniques.

The media validation questionnaire is quantitative, and the data can be processed by presenting a percentage using a Likert scale as a measurement scale. This scale is arranged as a statement followed by five responses—a modified research development measurement scale from Riduwan. For quantitative analysis, the answers can be scored as follows.

Table 1. Likert Scale

Quantitative Analysis	Score
Very good	5
Well	4
Enough	3
Not enough	2
Very less	1

The level of scale measurement in this study uses intervals. Interval data can be analyzed by calculating the average answer based on the scoring of each answer from the respondent. Percentage of Respondents Answers (X) is calculated by formula:

$$X = \frac{\text{Total Score obtained}}{\text{Highest or Ideal Score}} \times 100\% \quad (1)$$

The results of the assessment scores are then searched for the average of some test sample subjects and converted to assessment statements to determine the quality and level of usefulness of the resulting product based on user opinions. The conversion of scores into these assessment requirements can be seen in the following.

Table 2. Guttman Scale Interpretation Score

Percentage Score (%)	Interpretation
81 - 100	Very Worthy
61 - 80	Worthy
41 - 60	Decent enough
21 - 40	less worthy
0 - 20	Very Less Worthy

Result and Discussion

This research produces Instagram-based learning media on qualitative analysis materials for groups I and II, which can be accessed via Instagram @kimiafun2022 using Android smartphones, iPhones, and computers/PCs. This learning media utilizes the built-in features of the Instagram application in the form of Video Reels, Feeds, and Instagram Stories. The Video Reels from the Instagram application contain learning videos explaining qualitative analysis material for group I and II cations. At the same time, Instagram Stories is a new feature from Instagram that is very similar to the Snapchat application. In Instagram Stories, users can

directly share photos or videos of their activities that followers can see on Instagram. In addition, the new feature of Instagram stories can interact directly with followers who view stories. Instagram Story features used in this research are a question sticker, quiz sticker, and poll sticker. This learning media is designed as attractive and interactive as possible with the aim of attracting the attention of students. The learning media developed provides three levels of visualization of chemical representations and allows students and teachers to communicate easily through electronic devices such as smartphones and computers/PCs. Before using this learning media, students must download Instagram to their device from Google Playstore for Android users or App Store for iPhone users are required to have an Instagram account and login using their device as shown below.

Three validators carry out media validation, and two carry material validation. The validator assesses based on the aspects contained in the questionnaire, and the results of media validation are obtained as follows table 3.

Table 3. Media Validation Results

Assessed aspect	Validator			Total Empirical	Expected Total Score	Percentage	Criteria
	V1	V2	V3				
Main View							
a. The attractiveness of the Instagram interface display	4	4	5	13	15	86.6%	Very worth it
b. The suitability of the colour combination and image object with the background	4	5	5	14	15	93.3%	Very worth it
c. Clarity of font size and shape	5	5	4	14	15	93.3%	Very worth it
d. The appropriateness of the placement of the text	4	5	3	12	15	80%	Worth it
Image Display							
a. Shape the image on the Instagram video	5	5	4	14	15	93.3%	Very worth it
b. Image Size	4	5	3	12	15	80%	Worth it
c. Image Variations	5	5	4	14	15	93.3%	Very worth it
Writing display							
a. Title writing	5	5	4	14	15	93.3%	Very worth it
b. Font size in writing	4	5	4	13	15	86.6%	Very worth it
c. Clarity of writing	4	5	3	12	15	80%	Worth it
Instagram accounts are used in learning Group I and II Cation Qualitative Analysis with a multi-representational approach.	5	3	3	11	15	73.3%	Worth it

Based on the table of media validation results, the first aspect, namely the main display, has an average percentage of the three validators of 88.3%. Then in the second aspect, the image display has an average percentage of 88.87%. Then, in the third aspect, the writing display has an average percentage of 86.63%. Furthermore, finally, the fourth aspect has an average percentage of 73.3%. Therefore, of the four aspects, if the average return is calculated, the results are 84.27%, so the media is feasible to use in this study.

The validator also provides comments and suggestions regarding the media for future research to improve it. Comments and suggestions can be seen in the following Table 4.

In the implementation of infographics through Instagram Reels on Qualitative Analysis of Cation Groups I and II, there are several responses or responses from account followers. Most of these responses can be in the form of a question related to the material discussed in the video.

Table 4. Validator Comments

Validator	Comments
VI	-
V2	This media cannot be said to be multiple representations because it only plays with text. It is better to add a little animation and diagrams in the form of infographics. When the infographic appears, the presenter is voice-only. Do not always presenters who appear continuously.
V3	In general, the presentation of learning media with Instagram is interesting. However, some things can still be maximized. The chemical representation approach has appeared on Instagram media. However, can one more video describe the process of changing the colour of the precipitate? Because the natural micro aspect explains how compounds react, what is shown in the video focuses on symbols and reaction results. Concrete suggestions, make one animated video illustrating the process of chemical reactions between compounds that produce colour changes or precipitates (Only illustrations with the narrator's voice, no narrator's pictures. Students will focus more on seeing the reaction process and listening to the narrator's explanation.

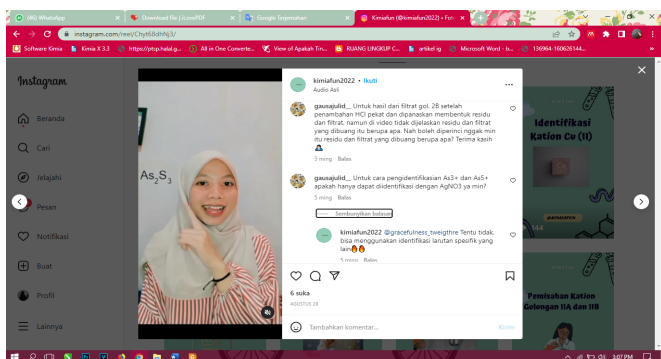


Figure 1. Video responses by account followers

The video reels received a response or response from one of the accounts belonging to @gausajulid_ with the question, "How to identify As^{3+} and As^{5+} can only be identified with $AgNO_3$, right?". Then we gave feedback on the question: "Of course not, you can use another specific solution identification".

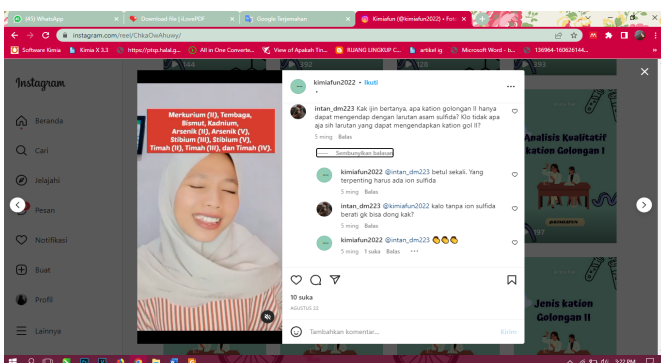


Figure 2. Video responses by account followers

On other video reels, there are responses from other followers, one of which is when discussing the types of group II cations. For example, in the video reels, one of the accounts belonging to @intandm223 asked, "Sis, may I ask, can group II cations only precipitate with a solution of sulphide acid? If not, what are the solutions that can precipitate goal II cations?". Then we gave feedback with the answer, "very true. Most importantly there must be sulfide ions". In addition, there is another account belonging to @zahira_itsa with the question,

"Sis, let me ask, in the identification of goal 2 before streaming H_2S , right there is adding HCl , what is that for?...is it to check that there is no goal 1 cation?". Again, we provide feedback: "to precipitate group II cations of course".



Figure 3. Instagram story benefits of water

The results of the qualitative data obtained and analyzed show that Instagram Reels can increase student interest in learning, as seen from the responses or responses given. In addition, this media can also be used as a student learning media, especially in qualitative analysis of group I and II cations. In line with research from Rokhim et al. (2021) said that Instagram feed infographics that are packaged lightly and attractive visualizations can attract attention because it is one of the media that is currently still loved by the younger generation so the creativity of the infographic can improve learning outcomes.

Before using this feature, we uploaded an Instagram Story about the benefits of plain water, which contains many cations and is good for the body. The Instagram Story aims to provide story viewers with information related to cations in everyday life. We apply a poll sticker with cation analysis material to ask the respondent, "Do you know about the qualitative analysis of cations yet?". The Instagram Story can be seen in Figure 2. Before using this feature, we uploaded an

Instagram Story about the benefits of plain water, which contains many cations and is good for the body.

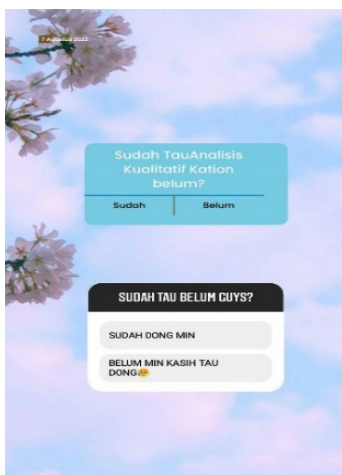


Figure 4. Polling sticker on Instagram story



Figure 5. Instagram story identification of cations



Figure 6. Instagram Story about the flame test

Based on the Instagram Story, the number of viewers was 58, and those who responded to the sticker poll were 38 people, with the highest number of votes being those who answered "already", as many as 22 people. It shows that most Instagram Story viewers already know what qualitative analysis means.

The next Instagram Story is about analysing cations' presence in a substance. There are several ways, namely, the first can be identified by the sample's colour, then the sample's shape, the sample's smell, the solubility test, and the last is the flame test. The Instagram Story can be seen in Figure 5.

Based on the Instagram Story, the ions included in group one are Pb, Ag, and Hg. Cations of this group will form precipitates when reacted with dilute hydrochloric acid. The white precipitate is lead chloride (PbCl₂), Mercury(I) chloride (Hg₂Cl₂), and silver chloride (AgCl) and which precipitated as a chloride salt. In PbCl₂, the remaining precipitate was precipitated quantitatively again with H₂S. Because lead chloride is slightly soluble in water, lead never settles completely, especially when exposed to chloride (Basset et al., 1994).

Group two cations are more numerous than group one. Ions in group two are Hg²⁺, Pb⁺, Bi³⁺, Cu²⁺, Cd²⁺, As³⁺, Sb³⁺, Sn²⁺, Sn⁴⁺. These ions are soluble in HCl but will form hydrogen sulphide precipitates in dilute mineral acids. Group II cations are also divided into two sub-groups: the copper sub-group and the arsenic sub-group. The division of these sub-groups is based on the solubility of the sulphide precipitate in ammonium polysulfide. In the copper sub-group, sulphides are insoluble in this reagent, while the sulphides in the arsenic sub-group will dissolve in this reagent and form thiosalts (Basset et al., 1994).

The book also explains that the cations belonging to the copper sub-group are mercury (II), lead (II), bismuth

(II), copper (II) and cadmium (II). While the cations belonging to the arsenic sub-group are arsenic (III), arsenic(V), stibium (II), stibium(V), tin (II) and tin (V). The next Instagram Story is to use the question sticker feature where we ask the audience about the flame test in group I and II cation analysis. Story viewers were asked to write down one of the colours seen on the metal when tested using group I and II cations. Questions can be seen in Figure 6.

The number of viewers on Instagram Story this time was 72 people, and several viewers gave various answers. The audience's answer in Story is seen in the following table 5.

Table 5. Audience's Responses

*Some of the audience's responses to questions related to the flame test

Based on the table, it can be seen that audience interaction is also very high. This question sticker feature helps us to dig up data and information from them. Question stickers can allow Instagram users to bring up a topic, such as questions and so on and can directly respond to these questions by other Instagram users (Indriani, 2022).

The audience's response to the metallic flame colour is also correct. Based on the Instagram story responses, the audience has begun to be interested in discussing the topic of group I and II cation analysis so

that later it can generate interest in studying this analytical chemistry sub. In line with research from Alfarizi (2022), which states that the use of Instagram applications can affect students' interest in learning, as evidenced by the results of questionnaires from respondents, namely 84% of students answered agree that the use of Instagram greatly affects their interest in learning. The next Instagram Story explains the various metallic flame colours of the ions in groups I and II. Finally, an explanation of the colour of the metal flame can be seen in Figure 7.



Figure 7. Instagram Story about metal flame color



Figure 8. Instagram Story "Who am I?"

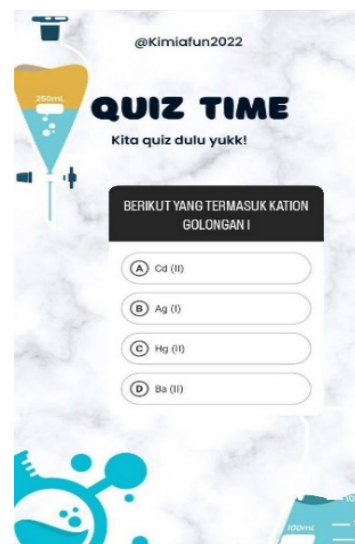


Figure 9. Instagram Story "Quiz Time"

With an attractive appearance and clear colour explanations, it can provide information on the colour of the metal flame to Instagram Story followers or viewers. It can also increase student interest in analytical chemistry, especially qualitative analysis of group I and II cations. Next is Instagram Story, which uses a question sticker. The written questions are more towards guessing "Who am I?" which the audience will answer according to the clue, whether it means group I or II cations. Questions can be seen in Figure 8.

In the story, the number of viewers was 71, and most of them answered with the right answer, namely group I cations. Therefore, the answers from the story viewers are shown in table 6.

Based on the audience's responses to the Story, it can be concluded that they have answered the question correctly, namely group I cations. Vogel's book explained that the cations of group I, Ag, Pb, and Hg, will form a white precipitate when reacted with hydrochloric acid (Basset et al., 1994). The last Instagram Story uses a sticker quiz where a question is asked about the group I and II cation analysis. This quiz time aims to check the understanding of Story viewers after getting some knowledge about the group I and II cation analysis in previous Instagram Stories.

Table 6. Responses from Instagram Stories

* Some of the audience's responses to the question "who am I?"

The questions in the quiz time pointed more to those belonging to group I cations. The correct answer was Ag(I), and 38 people answered correctly, while seven people answered Hg(II), four people answered Ba(II), and none of them answered correctly. choose to answer Cd(II). So that the total audience who saw this Story was 73 people and 49 people responded by choosing the correct answer.

The use of the Instagram application is currently a significant influence on learning interest; when interest in learning increases, learning outcomes also increase. Instagram can positively impact student learning (Erarslan, 2019). The use of the Instagram application is currently a major influence on interest in learning. When interest in learning increases, learning outcomes also increase. The Instagram application influences learning outcomes because it can facilitate student learning activities. After all, they can easily obtain information and exchange opinions with others (Khairuni, 2016). Alternative learning media today are books or Power Point files provided by educators and social media. For example, Instagram can also be a new alternative for students. Dewi (2020) supports this, which states that Instagram also affects learning outcomes because it can be used for alternative learning.

Based on the qualitative data obtained and analyzed, it can be concluded that students' interest in learning is increasing, as evidenced by the time most of the quiz time answer correctly. In addition, the Instagram Story display is packaged in an attractive, colourful way so that the audience becomes more interested in paying attention. Sukiyasa et al. (2013) concluded in their research that learning outcomes and students' motivation to learn the material being taught would be higher than learning that only uses power points. It shows that student and student learning when using a more precise image visualization, can increase learning motivation so that it relates to learning interest and student learning outcomes to be high. Research from Rokhim et al. (2021) supports the statement that visualizing attractive images can be an advantage in displaying Instagram feeds and other features that affect students' interest in seeing them.

Conclusion

Based on the results of research data obtained from descriptive qualitative analysis, it can be seen that Instagram media on group I and II cation analysis materials can be said to be feasible and effective in increasing student interest in learning about the group I and II cation analysis which the material is considered difficult.

Acknowledgements

This study only discusses the analysis of group I and II cations, which can later be developed again on other materials and can be modified using other media or features.

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