



## Instagram-Based Learning Media on The Subject Chemistry in Our Environment

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### Abstract

The appropriate use of learning media is essential as a tool to help students explore and enhance their understanding. In line with the advancement of time and technology, the learning process and access to information are no longer limited to what is provided by the teacher but can also be obtained from various sources, including social media. Therefore, this study aims to develop Instagram-based learning media as a self-learning resource for students. This media covers the topic "Chemistry in Our Environment". The type of research used in this study is design and development based on the Richey and Klein model, which includes three stages: planning, production, and evaluation. This study resulted in the development of Instagram-based learning media on the subject Chemistry in Our Environment, which has been tested for its validity. The media contains learning outcomes, learning objectives, meaningful understanding, guiding questions, and learning materials presented on the Instagram account @belmiaclass. The validity test results indicate that this Instagram-based learning media is highly valid, with a score of 93% for content aspects and 100% for media aspects. Therefore, the media can proceed to the next stages, namely practicality testing and effectiveness testing.

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## 1. INTRODUCTION

The use of effective and appropriate instructional media is essential in supporting students' exploration and independent learning (Putri et al., 2022). In accordance with the Decree of the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia Number 56 of 2022 regarding the Merdeka Curriculum, which emphasizes student-centered learning, teachers are positioned primarily as facilitators. Consequently, students are expected to independently seek and construct knowledge from a variety of sources. In line with the increasing accessibility of technology and the widespread use of social media, numerous innovations have emerged in the field of education. Social media is no longer used solely for communication and social networking purposes, it has also become a valuable tool to support and enhance the learning process (Hanif & Imran, 2022).

Currently, approximately 80% of the younger generation have social media accounts such as WhatsApp, Instagram, Facebook, and LinkedIn. Technological advancements have facilitated greater connectivity, enabling the widespread dissemination of educational content through these platforms (Kaur & Gurnani, 2022). Instagram, in particular, is easily accessible via smartphones, laptops, and computers, and functions as a medium for sharing information with a wide audience in the form of photos and videos (Aprilizdihar et al., 2022).

Instagram was launched in 2010 and allows users to share photos and videos through its application or website (Carpenter et al., 2020). With a variety of features such as feeds, reels, stories, and live streaming, Instagram can be utilized as an interactive learning medium. The use of these features can enhance students' interest in participating in the learning process. Educational content presented through Instagram tends

to have a more visually appealing display, which can foster students' motivation and interest in learning (Laily et al., 2022).

A review of existing Instagram-based educational accounts reveals a lack of comprehensive utilization of the platform's full range of features for instructional purposes. The majority of accounts examined tend to present content in a concise manner, often limited to brief explanations or isolated pieces of information. In several cases, chemical phenomena are displayed without clear integration into established chemistry learning concepts, thereby requiring students to independently seek additional explanations from other sources. Moreover, the content is frequently presented without a coherent structure, and the visual design tends to be monotonous, lacking in both aesthetic appeal and instructional diversity.

The topic "Chemistry in Our Environment" is an introductory subject in high school chemistry that closely relates to everyday life. Connecting chemistry learning to real-life contexts can facilitate students' understanding of the material. Students tend to benefit when the material is linked to their prior experiences or existing knowledge (Rahmawati et al., 2020). However, the integration of chemistry content with everyday life examples is often overlooked by teachers at the beginning of instruction, despite its importance in fostering students' interest in chemistry. Therefore, it is necessary to present learning in an engaging manner that motivates students to develop a greater appreciation for chemistry. Based on this rationale, the present study aims to develop Instagram-based instructional media on the topic Chemistry in Our Environment, featuring an attractive design and well-organized, structured content through the Instagram account @belmiaclass. The novelty of this development lies in the content substance as well as the optimal utilization of Instagram's features to support the learning process.

## 2. METHOD

This study employed a design and development research approach as proposed by Richey and Klein. This approach involves a systematic examination of the design development and evaluation process, aiming to establish an empirical foundation for creating products and tools, whether educational or non-educational, as well as to develop or refine models used in the development process (Richey & Klein, 2007). This type of research is

a systematic method conducted to produce a product, followed by an evaluation process of the product. The method consists of three main stages: planning, production, and evaluation (Sugiyono, 2019).

The product resulting from this study is Instagram-based learning media on the subject Chemistry in Our Environment. During the planning phase, material analysis and needs analysis were conducted. Subsequently, in the production phase, the learning media was developed according to the pre-established design. Finally, the learning media was evaluated for its validity. The validity test was conducted by expert validators.

A literature review and an interview with an Instagram user who is a senior high school student were conducted to obtain information as a basis for determining the needs in developing this learning media. The validity assessment of the learning media was carried out using a validation sheet evaluated by two content expert validators and two media expert validators. The validation sheet contains several aspects serving as the criteria for the evaluators' assessment. The measurement of expert perception validity in this study utilized a validation sheet combining a closed-ended Likert scale questionnaire (as shown in Table 1) and an open-ended questionnaire. The experts' comments were used to revise the product. The average validity score was determined based on the scores given by the validators according to the following criteria.

Table 1. Likert scale assessment

Assessment Scale	Criteria
4	Very Good
3	Good
2	Fair
1	Poor

The data analysis technique employed in this study is quantitative descriptive analysis, conducted by calculating the average score of each assessment aspect provided by the validators. The scores obtained were analyzed using the following validity test formula:

$$\text{Validity Percentage (\%)} = \frac{\text{Obtained Score}}{\text{Maximum Ideal Score}} \times 100\% \quad (1)$$

The resulting percentage of validity was then interpreted qualitatively. Notes or suggestions from the validators were used by the researcher to revise the product. The validity criteria are presented in the following table:

Table 2. Validity Criteria

Percentage (%)	Criteria
$85 \leq \% \leq 100$	Highly Valid
$70 \leq \% < 85$	Valid
$55 \leq \% < 70$	Moderately Valid
$40 \leq \% < 55$	Less Valid
$25 \leq \% < 40$	Not Valid

### 3. RESULT AND DISCUSSION

#### 3.1. Result

This study produced Instagram-based learning media focusing on the subject Chemistry in Our Environment. The media design comprises a series of images and videos uploaded in the form of feeds, reels, stories, and highlights on the Instagram account @belmiaclass. This account can be accessed via mobile devices or desktop computers, either by downloading the Instagram application or through its official website. The development of this learning media employed the design and development model proposed by Richey and Klein, which consists of three main stages, namely:

#### 1. Planning

##### a. Content Analysis

The content analysis was conducted in accordance with the Decree of the Ministry of Education, Culture, Research, and Technology Number 033/H/KR/2022, which amends Decree Number 008/H/KR/2022 concerning learning outcomes for early childhood education, primary education, and secondary education under the Merdeka Curriculum.

Based on the analysis of the learning outcomes, learning objectives were formulated to serve as guidelines in the development of the learning media. The learning objectives embedded in this media are for students to be able to explain Ilmu Kimia dan Peranannya, Metode Ilmiah, dan Keselamatan Kerja di Laboratorium. Based on these learning outcomes and objectives, the conceptual framework for the subject Chemistry in Our Environment is illustrated in Figure 1.

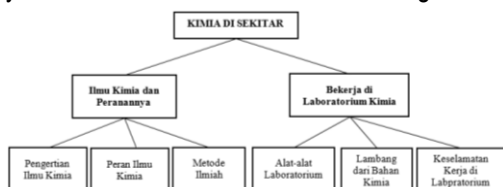


Figure 1. Concept of the material

##### b. Needs Analysis

- 1) Functional needs analysis, this refers to the components required in the design of Instagram-based learning media for the subject Chemistry in Our Environment.

Table 3. Learning media design

Media Design	Description
	Instagram media and learning videos are combined using an environment theme.
	The sequence of feeds is arranged according to the concept map. The material titles are numbered as follows: 1. Ilmu Kimia dan Peranannya 2. Bekerja di Laboratorium Subsequent structure includes learning outcomes and objectives, meaningful understanding, and stimulating questions. Each subtopic is also numbered according to the material and contains explanations that can be swiped through in several slides. Practice questions and daily quizzes are available in the Instagram highlights.

2) Non-functional needs analysis involves identifying the tools or applications required in the development process of Instagram-based learning media on the subject Chemistry in Our Environment, which include Canva, Powtoon, Google Forms, and Quizizz.

## 2. Production

At this stage, the artifact designed during the planning phase is created using the Canva application, selecting animations, with the chosen font color being brown. Three types of fonts are used: Pink Chicken at 19 pt, Hawa Dowing at 13 pt, and Caveat Brush at 28 pt. Subtopics use the Pink Chicken font, while slides within subtopics utilize Hawa Dowing and Caveat Brush fonts. After selecting the animation, colors, and fonts, the content is incorporated into the corresponding design. The resulting product consists of images and animated learning videos on the topic Chemistry in Our Environment, which are uploaded to the Instagram account @belmiaclass.

## 3. Evaluation

### a. Content Validity and Assessment Reliability

The validity data for the content aspect of the Instagram-based learning media on the subject Chemistry in Our Environment and the reliability of the assessment are presented in Table 4.

Table 4. Data of content validity and assessment reliability

Aspect	Stage 1				Stage 2			
	Validity		Reliability		Validity		Reliability	
	%	Criteria	%	Criteria	%	Criteria	%	Criteria
Content Feasibility	72	Valid	85	Reliable	94	Highly Valid	100	Reliable
Question	75	Valid	100	Reliable	79	Valid	95	Reliable
Language Usage	78	Valid	96	Reliable	87	Highly Valid	86	Reliable
Average	75	Valid	94	Reliable	87	Highly Valid	94	Reliable

Based on Table 4, the content validity of this learning media is rated as highly valid, and the assessments conducted by the two content expert validators are reliable. This indicates that the evaluations provided by these experts are consistent.

### b. Media Validity and Assessment Reliability

The validity data for the media aspect of the Instagram-based learning media on the subject Chemistry in Our Environment and the reliability of the assessment are presented in Table 5.

Table 5. Data of media validity and assessment reliability

Aspect	Stage 1				Stage 2			
	Validity		Reliability		Validity		Reliability	
	%	Criteria	%	Criteria	%	Criteria	%	Criteria
Instagram Account Name and Profile Logo	100	Highly Valid	100	Reliable	100	Highly Valid	100	Reliable
Function and Benefits of Learning Media Display	95	Highly Valid	95	Reliable	100	Highly Valid	100	Reliable
Characteristics of Media Uploaded on Instagram Account	92	Highly Valid	98	Reliable	100	Highly Valid	100	Reliable
Average	96	Highly Valid	98	Reliable	100	Highly Valid	100	Reliable

Based on Table 5, the media validity of this learning media is rated as highly valid, and the assessments conducted by the two content expert validators are reliable. This indicates that the evaluations provided by these experts are consistent.

## 3.1. Discussion

Instagram is one of the most popular social media platforms among high school students. This platform offers a variety of features that can be utilized to support the learning process. The development of innovative and engaging learning media variations for students serves as the background for this research. The Instagram account @belmiaclass functions as an Instagram-based learning media that presents the subject Chemistry in Our Environment. The materials on this account are arranged neatly and structurally, utilizing various available features such as feeds, reels, Instagram stories, highlights, and Instagram livestreaming. The use of these features aims to motivate students and increase their interest in studying chemistry.

The material analysis stage was conducted through a literature study on the Phase E learning outcomes related to the chemistry understanding element, based on the Decree of the Head of the Agency for Education Standards, Curriculum, and Assessment (BSKAP) of the Ministry of Education, Culture, Research, and Technology (Kemdikbudristek) Number 033/H/KR/2022. Based on this analysis, the learning objectives were formulated to serve as guidelines for

developing the learning media. The learning objectives included in this media are for students to be able to explain chemistry and its roles, the scientific method, and laboratory safety. Based on these learning outcomes and objectives, the subject Chemistry in Our Environment covers the material on chemistry and its roles, as well as working in the chemistry laboratory.

The needs analysis in the development of Instagram-based instructional media on the topic Chemistry in Our Environment includes both functional and non-functional analyses. The functional needs analysis was conducted by aligning the visual background between images and learning videos themed around the environment, as well as designing the initial media structure consisting of post arrangements, including the layout management of feeds and reels, as presented in Table 3. Meanwhile, the non-functional needs analysis involved selecting supporting tools, such as Canva, which was used to design images due to its accessibility and variety of animation and font options (Marwadi, 2022). The Powtoon platform was utilized to create attractive animated learning videos. Google Forms was employed to prepare post-test questions as an online data collection tool. Additionally, Quizizz was used to develop interactive game-based daily quiz questions. The use of Quizizz in learning has been proven to increase students' interest, encourage active participation, and help them maintain better focus during learning activities (Wismiati et al., 2025). The use of automated assessment systems through software can facilitate teachers in evaluating students' learning outcomes (Hendra et al., 2023).

The production phase of the Instagram-based instructional media was conducted based on the initial design using the Canva platform, selecting animations that matched the theme, appealing colors, and three types of fonts (Pink Chicken, Hawa Dowing, and Caveat Brush). The content was incorporated into templates consistent with the design to clarify the material presentation, enhance students' understanding, and improve retention. The product, consisting of images and animated videos on the topic "Chemistry in Our Environment," was uploaded through feeds, reels, stories, and highlights. The inclusion of videos and images enriches the students' learning experience. A study by Romadhoni (2025) demonstrated that video-assisted learning can improve students' critical thinking

skills. The feeds consist of introductory images, the main topics, learning outcomes and objectives, meaningful comprehension, triggering questions, and six core subtopics (definition of chemistry, the role of chemistry, scientific methods, laboratory equipment, chemical symbols of laboratory materials, and laboratory safety), each presented in multiple slides or videos. Content is also published in the form of reels and Instagram stories, then grouped into highlights labeled "Chemistry: Materials" and "Chemistry: Questions." Practice questions, post-tests, and daily quizzes are uploaded through Instagram stories using multiple-choice features or links to Google Forms and Quizizz.

The validation results for the content aspect of the Instagram-based instructional media on the topic Chemistry in Our Environment indicate that the media is valid and reliable (Table 4), although improvements are still needed based on expert suggestions. After revisions and the second stage of validation, the instructional content was rated as highly valid with reliable assessment instruments. The material aligns with the learning outcomes stipulated in the decree of BSKAP Kemendikbudristek Number 033/H/KR/2022, with the addition of real-life examples of chemical elements in the surrounding environment to facilitate student understanding. When students can observe concrete examples from their environment, they more easily connect theory to practical experience, thereby enhancing comprehension (Swistiyawati & Indrayani, 2024). Improvements were also made regarding the scope, depth, and completeness of the material by adding examples of common chemical substances, clarifying texts, and refining definitions to prevent misconceptions. Misconceptions are a serious issue as they can negatively impact the acceptance of concepts or subject matter if left unaddressed. Therefore, identifying and implementing solutions to overcome students' misconceptions is essential (Agustina et al., 2024). The questions in the media were developed proportionally in accordance with the learning objectives, although further refinement is needed to improve discriminatory power and reduce ambiguity. The quality of test items is a critical factor in constructing effective assessment instruments (Mania et al., 2020). Additionally, the language used in this media corresponds with student characteristics, thereby supporting interaction, increasing motivation, and facilitating student understanding. Using simple and

engaging language in instructional media can create the impression that students are directly interacting with the teacher (Wulandari et al., 2022).

The media aspect of the Instagram-based instructional media was rated as highly valid using reliable assessment instruments, as shown in Table 5. Improvements were made by adding captions to each post to enhance interactivity and the media's appeal. Consistent with the findings of Iyabu (2021), interactive multimedia support positively influences students' learning outcomes. This media utilizes the account with the username @belmiaclass, an abbreviation for "belajar kimia bersama" (learning chemistry together), complemented by a brightly colored logo designed to stimulate students' learning motivation. Instructional media presented with high-quality graphics can provide optimal benefits for students (Nurmasita et al., 2023). Regarding functionality and benefits, this media leverages Instagram as an easily accessible and familiar platform among the student age group. Its use is not limited to gadgets alone but can be accessed through various software platforms. Instagram is user-friendly and can be utilized as a self-directed learning resource for students (Lovina et al., 2021). The media display consists of images and videos with a consistent design, clear fonts, and bright colors that are comfortable to view, accompanied by captions to clarify the content. The feeds are neatly organized, starting from the identity, the main topic "Chemistry in Our Environment," and subtopics, making the entire media attractive, communicative, and supportive of student understanding. Students prefer instructional media that is visually appealing, colorful, and presented in easily understandable language (Utami, 2021).

#### 4. CONCLUSION

This study has successfully developed Instagram-based instructional media for the topic "Chemistry in Our Environment", which can function as an independent learning resource for students. The media was rated as highly valid based on evaluations and feedback from subject matter experts and media experts. However, the study was limited to the validation phase without empirical testing of its effectiveness in classroom settings. Therefore, further research is recommended to evaluate the media's impact on student learning

outcomes, engagement, and critical thinking skills in real classroom environments.

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#### 6. REFERENCES

- Agustina, T., Hamdu, G., & Putri, A. R. (2024). Identifikasi Miskonsepsi Peserta Didik Pada Materi Sistem Pencernaan Manusia Di Sekolah Dasar. *Jurnal Ilmiah Wahana Pendidikan*, 10(4), 859–868. <https://doi.org/10.5281/zenodo.10537272>
- Aprilizdihar, M., Pitaloka, E. D., & Dewi, S. (2022). Pemanfaatan Sosial Media Sebagai Sarana Pembelajaran di Era Digital. *Bapala*, 5(1), 40–49. <https://doi.org/10.30871/deca.v5i01.3717>
- Carpenter, J. P., Morrison, S. A., Craft, M., & Lee, M. (2020). How and why are educators using Instagram? *Teaching and Teacher Education*, 96, 103149. <https://doi.org/10.1016/j.tate.2020.103149>
- Hanif, A., & Imran, M. (2022). When technology-based learning is the only option: evaluating perceived usefulness of social media. *Turkish Online Journal of Distance Education-TOJDE*, 23, 1302–6488. <https://doi.org/10.17718/tojde.1096252>
- Hendra, Afriyadi, H., Tanwir, Hayati, N., & Laila, N. S. (2023). *Media Pembelajaran Berbasis Digital*. Sonpedia Publishing Indonesia.
- Iyabu, H., Ischak, N. I., & Supriadin, Y. (2021). Pengaruh Model Pembelajaran NHT (Numbered Heads Together) dengan Bantuan Multimedia Interaktif Terhadap Hasil Belajar Siswa pada Materi Laju Reaksi. *Jambura Journal of Educational Chemistry*, 3(2), 53–60. <https://doi.org/10.34312/jjec.v3i2.11897>
- Kaur, K., & Gurnani, B. (2022). Commentary: Impact of social media applications like Instagram, Facebook, Twitter, and YouTube on ophthalmological education. *Indian Journal of Ophthalmology*, 70(9), 3253–3254. [https://doi.org/10.4103/ijo.ijo\\_1163\\_22](https://doi.org/10.4103/ijo.ijo_1163_22)

- Laily, I. M., Astutik, A. P., & Haryanto, B. (2022). Instagram sebagai Media Pembelajaran Digital Agama Islam di Era 4.0. *Munaddhomah: Jurnal Manajemen Pendidikan Islam*, 3(2), 160–174. <https://doi.org/10.31538/munaddhomah.v3i2.250>
- Lovina, L., N. F., E. R., & M. S. (2021). Pengembangan Modul Pembelajaran Berbasis Media Sosial Instagram Pada Mata Pelajaran Kimia Kelas X SMA N 1 Kecamatan Kapur IX. 5(2), 87–92. <https://doi.org/10.24014/konfigurasi.v5i2.14048>
- Mania, S., Fitriani, F., Majid, A. F., Ichiana, N. N., & Abrar, A. I. P. (2020). Analisis butir soal ujian akhir sekolah. *Al Asma : Journal of Islamic Education*, 2(2), 274. <https://doi.org/10.24252/asma.v2i2.16569>
- Marwadi, N. (2022). Pemanfaatan Aplikasi Canva Pada Pembelajaran Menyusun Teks Iklan Kelas XII DKV 2 SMKN 13 Surabaya. *Jurnal Konfigurasi*, 9(8), 198–207.
- Nurmasita, N., Enawaty, E., Lestari, I., Hairida, H., & Erlina, E. (2023). Pengembangan e-LKPD Berbasis Problem Based Learning (PBL) pada Materi Reaksi Redoks. *Jambura Journal of Educational Chemistry*, 5(1), 11–20. <https://doi.org/10.34312/jjec.v5i1.15991>
- Putri, D. N. S., Islamiah, F., Andini, T., & Marni, A. (2022). Analisis Pengaruh Pembelajaran Menggunakan Media Interaktif Terhadap Hasil Belajar Siswa Sekolah Dasar. *Jurnal Pendidikan Dasar Dan Sosial Humaniora*, 2(2), 36–367. <https://doi.org/10.53625/jpdsh.v2i2.4290>
- Rahmawati, Y., Ridwan, A., Faustine, S., & Mawarni, P. C. (2020). Pengembangan Soft Skills Siswa Melalui Penerapan Culturally Responsive Transformative Teaching (CRTT) dalam Pembelajaran Kimia. *Jurnal Penelitian Pendidikan IPA*, 6(1), 86–96. <https://doi.org/10.29303/jppipa.v6i1.317>
- Richey, R. C., & Klein, J. D. (2007). *Design and Development Research: A Methodological Primer*. Lawrence Erlbaum Associates.
- Romadhoni, S. D., Hakim, F., & Ningrum, L. S. (2025). The Effectiveness of The Problem-Based Learning Model Assisted by Interactive Videos on Critical Thinking Skills. *Jambura Journal of Educational Chemistry*, 7(1), 22–29. <https://doi.org/10.37905/jjec.v7i1.27651>
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R & D (II)*. Alfabeta.
- Swistiyawati, N. L. P., & Indrayani, I. A. M. (2024). Analisis kesulitan siswa dalam memahami konsep ipas di kelas ii sd no. 5 taman. *Dharmas Education Journal (DE\_Journal)*, 5(2), 1316–1324. <https://doi.org/10.56667/dejournal.v5i2.1622>
- Utami, R. P. (2021). Desain dan uji coba lembar kerja peserta didik berbasis learning cycle 5e pada materi larutan penyangga. *Journal of Education and Teaching*, 2(1), 94. <https://doi.org/10.24014/jete.v2i1.8231>
- Wisniati, I., Suzanti, F., & Daryanes, F. (2025). Improving students' cognitive learning outcomes through quizz learning media. *Inornatus: Biology Education Journal*, 5(1), 37–47. <https://doi.org/10.30862/inornatus.v5i1.735>
- Wulandari, D., Arcana, I. N., & Kuncoro, K. S. (2022). Pengembangan Instagram Reels Pembelajaran Pokok Bahasan Persamaan Garis Lurus untuk SMP. *UNION: Jurnal Ilmiah Pendidikan Matematika*, 10(1), 1–14. <https://doi.org/10.30738/union.v10i1.12138>