

Validity of PowerPoint-iSpring Learning Media Integrated Prompting Question on Acid-Base Titration

Nesya Firia¹, Guspatni^{*1}

Departement of Chemistry, Faculty of Mathematics and Sciences,
Universitas Negeri Padang



Abstract— Acid-base titration is a difficult chemical concept for most students because it is abstract. The abstract concept require media that can display macroscopic, submicroscopic and symbolic representation to make student understand the concept. Powerpoint and iSpring can provide text, picture, audio, video, animation and quizzes to learning media to help student understand the abstract concept of chemistry. This study aims to determine the level of validity of the PowerPoint-iSpring learning media integrated Prompting questions on acid-base titration. This type of research is Design Research and uses the Plomp development model. The Powerpoint-iSpring learning media integrated prompting questions were validated by 5 material expert validators and 3 media expert validators. The research instrument was a material validation sheet consisting of content validation and construct validation, and media validation sheet. The results of the validation data were analyzed using Aiken's V data analysis techniques. The results showed the validity value of the PowerPoint-iSpring learning media integrated prompting questions for content validity was 0,92. The average value for construct validity is 0.92 and for media validity is 0.99. Thus, it can be concluded that the PowerPoint-iSpring learning media integrated prompting questions is valid and can be proceed to practicality and effectiveness test.

Keywords— acid-base titration, PowerPoint-iSpring, learning media, prompting question, validity

I. INTRODUCTION

Chemistry covers a very broad field, not only theory, chemistry is also concerned with solving problems, facts, special terms, abstract and complex chemical rules [1][2]. Concepts in chemistry cannot be separated from one another because chemical concepts are interrelated [3]. Acid-base titration is a chemical material in senior highschool. And is a difficult material for most students [4]. In order to make students' concepts understand better, meaningful learning should be applied [3].

Powerpoint can be used to create learning multimedia. Powerpoint has the advantage that it can produce effective, attractive and efficient presentations with the use of text, images, colors, videos, animations and others [5][6][7]. PowerPoint can be used to create more interesting learning media when combined with the iSpring program. iSpring can make media more organized and interactive where media can be published in flash and HTML formats and can be run on various operating systems [8]. Utilization of learning media made using this program can improve students' ability to think critically, increase student motivation in learning, and improve student learning outcomes [9][10][11]. PowerPoint can be interactive with available animation features such as hyperlinks, triggers and other Custom Animation effects. The combination of features available in PowerPoint can be used to display macroscopic, submicroscopic and symbolic levels in chemical materials.

To make students active in finding a concept in learning, in accordance with the demands of the 2013 curriculum, the learning

media is integrated with prompting questions. Prompting questions are questions that aim to guide students to find new concepts through several instructions that help students answer questions properly and correctly [12][13][14]. Questions play a role in the learning process as a stimulus to encourage students to think and focus attention. Directed questions have a positive impact on students. Students will be motivated to express opinions on a problem so that students actively think. The teacher will get feedback to improve students' understanding of the learning material. One technique of asking questions in the learning process is prompting questions[12]. Prompting questions are structured to link the knowledge that already exists in students with new knowledge gained by students [15]. Prompting questions can motivate students to improve student success, providing the experience of low-high questions to high-level questions [12]. Prompting questions can help improve students' activities and learning outcomes [16][17]. And also improve students' ability to solve problems, so that the thinking process occurs in students [18].). This study aims to determine the validity of the PowerPoint-iSpring learning media integrated prompting questions on acid-base titrations.

II. METHODOLOGY

2.1. Type of Research

This type of study is an educational design research which is a process to develop a new product or improve an existing product.

2.2. Research Procedure

This research use Plomp development model which has three steps, they are preliminary research, prototyping stage and assessment phase [19].

Preliminary research consist of need and analysis context, literatur review and conceptual framework. Need and context analysis looks into teacher and student perceptions of needs in the current situation, or what is more desirable in the current situation. Context analysis aims to explore the problem environment and map the scope of innovation. The literature review aims to gain more insight into solutions to problems that have been obtained regarding the products developed. The conceptual framework is carried out by identifying, detailing, and compiling the main concepts studied in the acid-base titration. The conceptual framework is used to link concepts related to product development

The prototyping stage is a stage for compiling the design of Powerpoint i-Spring learning media integrated prompting questions on acid-base titration. This stage consists of prototype I, rprototyp II, prototype III and Prototype IV. At the Prototype I stage, PowerPoint i-Spring learning media was designed based on the results of preliminary research, including needs analysis and context analysis, literature review relevant to Basic Competencies and subject matter materials according to the 2013 curriculum. At the prototype II, a formative evaluation is carried out on Prototype I. The formative evaluation at this stage is in the form of a self-evaluation questionnaire, which is a re-examination of the important components in the media. At prototype III, At, a one-to-one evaluation and expert review are carried out to obtain the level of validity of the developed media. At the prototype IV, a formative evaluation in the form of a small group evaluation of the prototype III that has been produced. However, due to the limited time of the study, the research on the integrated PowerPoint-iSpring learning media for prompting questions is only limited to the validation stage.

The assessment phase aims to measure the practicality and effectiveness of the PowerPoint-iSpring learning media integrated with prompting questions. Due to time constraints, the study was limited to validity testing only. Practicality test and effectiveness test will be carried out in further research.

2.3. Data Analysis Technique

Validity category is determined using Aiken's V formuls [20] with the validity category shows in Table 1.

$$V = \frac{\sum s}{n(c-1)}$$

Description:

r= number given by rater

lo= the lowest score

c= the highest score= number of raters

Table 1. validity category by Aiken's

No. of Items (<i>m</i>) or Raters (<i>n</i>)	Number of Rating Categories (<i>c</i>)											
	2		3		4		5		6		7	
	V	p	V	p	V	p	V	p	V	p	V	p
2							1.00	.040	1.00	.028	1.00	.020
3							1.00	.008	1.00	.005	1.00	.003
3			1.00	.037	1.00	.016	.92	.032	.87	.046	.89	.029
4					1.00	.004	.94	.008	.95	.004	.92	.006
4			1.00	.012	.92	.020	.88	.024	.85	.027	.83	.029
5			1.00	.004	.93	.006	.90	.007	.88	.007	.87	.007
5	1.00	.031	.90	.025	.87	.021	.80	.040	.80	.032	.77	.047

III. RESULT AND DISCUSSION

This research produces a product in the form of an PowerPoint-iSpring learning media integrated prompting questions. This study uses the Plomp development model which consists of several stages, namely preliminary research, prototyping stage and assessment phase

In the preliminary research stage, it shows that the method used during learning is lecture. This makes students less actively involved during learning and learning becomes less student-centred. Teachers also need learning media that can contain text, images, videos, animations, quizzes, and interactive questions to help students understand good acid-base titration concept. Powerpoint can create learning multimedia with effective, attractive and efficient presentations use of text, images, colors, videos, animations and others [5]. Prompting question make students active in finding a concept in learning to the demands of the 2013 curriculum. Prompting questions are questions that aim to guide students to find new concepts through several instructions that help students answer questions properly and correctly [12]. So the conceptual framework of the preliminary research is:

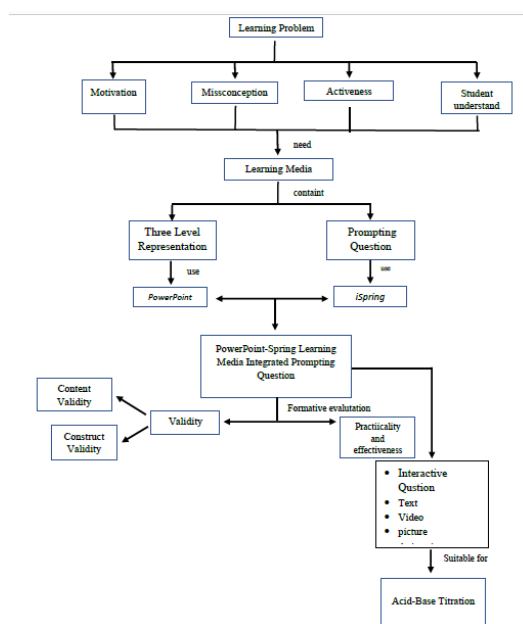


Figure 1. Conceptual Framework of PowerPoint-iSpring Learning Media

Based on the results of the preliminary research, a PowerPoint-iSpring learning media design was developed that was integrated with prompting questions for acid-base titration. At this stage the resulting prototype I is self-evaluated to produce prototype II. formative evaluation was carried out on prototype II in the form of one to one evaluation and expert review. In one to one evaluation, students were asked to use the integrated PowerPoint-iSpring learning media with prompting questions, after which students were

interviewed about the media. From the interviews, it was found that the display of the PowerPoint-iSpring learning media was attractive to students, the instructions for using the PowerPoint-iSpring learning media were easy to understand, the presentation of the material in the PowerPoint-iSpring learning media was sequential, the language used in the PowerPoint-iSpring learning media was easy to understand, the text, pictures, videos and animations in the PowerPoint-iSpring learning media can be seen clearly, the questions in the PowerPoint-iSpring learning media are easy to understand and help students to find concepts, but there are some typos found in the PowerPoint-iSpring learning media.

The resulting prototype II was also validated by five material expert validators and three media expert validators. The validity test consisted of three types, namely content validity, construct validity and media expert validity. Content and construct validation was carried out by three lecturers in the Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Negeri Padang and 2 teachers at SMA N 1 Akabiluru. The validity of media experts was carried out by three lecturers of the Department of Informatics Engineering, Faculty of Engineering, Universitas Negeri Padang. The data collection instrument for the validity test was in the form of a validation questionnaire. The data obtained from the validation questionnaire was processed using the Aiken's V Analysis technique. The results of the validity test can be seen in the following table:

Table 2. Material Experts Validation Results of of PowerPoint-iSpring Learning Media Integrated Prompting Questions

NO	Aspect	V	Category
1	Content Validity	0.92	Valid
2	Consttuct Validity	0.92	Valid
Average		0.92	Valid

The content validity evaluation aims to determine whether the media developed is in accordance with existing knowledge [19]. Based on the results of content validity data processing in Table 2 above, it can be seen that the validity value of the PowerPoint-iSpring learning media integrated prompting questions for content validity is 0.92, based on the Aiken's V validity criteria table, it shows that the learning media has met the validity criteria. This shows that the PowerPoint-iSpring learning media integrated prompting questions developed in accordance with existing knowledge.

The construct validity test is to assess whether the media is developed logically from the aspect of content, language, presentation and graphics [19]. Based on the results of content validity data processing in Table 2 above, it can be seen that the construct validity value of the PowerPoint-iSpring learning media integrated prompting questions is 0.92, based on the Aiken's V validity criteria table, it shows that the learning media has met the validity criteria. This shows that the PowerPoint-iSpring learning media is integrated prompting questions have been developed logically.

The next validity test is the media expert validity test. The media expert validity test was carried out by three validators. Based on the Aiken's V validity criteria table, the minimum value of the validity of an item with three validators and a 5 rating scale is 0.92. Thus, an item is declared valid if it has a V value equal to or greater than 0.92. The values assessed are efficiency, button accuracy and physical quality of the media. The results of the PowerPoint-iSpring media validity test can be seen in the following table:

Table 3. Media Experts Validation Results of of PowerPoint-iSpring Learning Media Integrated Prompting Questions

No	Aspect	V	Category
1	Media Efficiency	1	Valid
2	Button Reaction Accuracy	0.98	Valid
3	Physical Quality	1	Valid
Average		0.99	Valid

Based on Table 17, the average value of V for the efficiency aspect is 1 with a valid category. For the aspect of button accuracy, the value of V is 0.98 with a valid category. Meanwhile, for the physical quality aspect of the media, the value of V1 was obtained

with a valid category. Overall, from the aspects assessed, the average value of V for construct validity is 0.99, thus the integrated PowerPoint-iSpring learning media for prompting questions on acid-base titration material for class XI SMA/MA is declared valid by media experts.

Based on the validity result obtained from the content validity test and the construct validity test, an average of 0.92 was obtained, and media validity obtained average 0.99. Thus the PowerPoint-iSpring learning media integrated prompting questions on acid-base titration is declared valid and can be continued for practicality and effectiveness tests..

IV. CONCLUSION

The development of the PowerPoint-iSpring learning media integrated prompting questions on acid-base titration is an educational design research study using the Polmp development model. The media is declared valid and can be continued for practicality and effectiveness tests.

ACKNOWLEDGMENT

Thanks to Guspatni, S.Pd, M.A for guided to complete his research, thanks to Effendi, S.Pd, M.Sc, Zonalia Fitriza, S.Pd, M.Pd, Eka Yusmaita, S.Pd, M.Pd, Friza Yanti, S.Pd, and Noviarli, S.Pd as validator, student of SMA N 1 Akabiluru as responden of PowerPoint-iSpring learning media integrated prompting question on acid-base titration.

REFERENCES

- [1] Yakina, Y., Kurniati, T., & Fadhillah, R. 20017 "Analisis Kesulitan Belajar Siswa Pada Mata Pelajaran Kimia Kelas X Di Sma Negeri 1 Sungai Ambawang". *AR-RAZI Jurnal Ilmiah*, 5(2), 287–297.
- [2] Savitri, J., Firmansyah, R. A., & Wibowo, T. (2018). "Pengembangan Modul Berbasis Representasi Kimia pada Materi Asam Basa". *Pendidikan Kimia Fakultas Sains Dan Teknologi, UIN Walisongo*, 1(6), 11–21.
- [3] Marzuki, H., & Tri Astuti, R. (2017). "Analisis Kesulitan Pemahaman Konsep pada Materi Titrasi Asam Basa Siswa SMA". *Orbital: Jurnal Pendidikan Kimia*, 1(1), 22–27.
- [4] Sheppard, Keith. 2006. "Highschool Student Understanding of Titration and Related Acid-Base Phenomena". *Chemidtry Education Reasearch and Practicw*. 7, 1, 32-45
- [5] Pribadi, B. A. (2017). *Media dan Teknologi dalam Pembekajaran*. Jakarta: Kencana.
- [6] Widada, H. (2010). *Cara Mudah Design Presentasi dengan PowerPoint*. Yogyakarta: Cakrawala..
- [7] Suhermin, Isnawati, & Faizah, U. (2014). "Profil Media Slide Interaktif Berbasis Ms. Power Point pada Pokok Bahasan Substansi Genetika Kelas XII". Doctoral dissertation, State University of Surabaya. 3(1), 333–337.
- [8] Afandi, A. (2017). "Media Ict dalam Pembelajaran Matematika Menggunakan Powerpoint Interaktif dan Ispring Presenter". *Jurnal Terapan Abdimas*, 2, 19–26.
- [9] Sastrakusumah, E. N., Suherman, U., Darmawan, D., & Jamilah. (2018). "Pengaruh Media Pembelajaran Interaktif Berbantuan Aplikasi Ispring Presenter terhadap Kemampuan Berpikir Kritis". *Teknologi Pembelajaran* 3(1), 469–485
- [10] Nurseto, T. (2011). "Membuat Media Pembelajaran yang Menarik". *Jurnal Ekonomi Dan Pendidikan*, 8(1), 19–35.
- [11] Rafiq, M., Husni, S & Yelli, R. 2008. "Pengembangan Media Pembelajaran Matematika Berbasis Pendekatan Saintifik dengan Powerpoint & iSpring Suite pada Materi Perbandingan di Kelas VII SMP Negeri 1 Kota Jambi". *Jurnal Pendidikan Matematika*. 4, 0-18.
- [12] Jacobsen, D. . (2009). *Methods for Teaching Metode - Metode Pengajaran Meningkatkan Belajar Siswa TK-SMA*. Yogyakarta: Pustaka Pelajar
- [13] Jalius, E. (2009). *Pengembangan Program Pembelajaran*. Padang: UNP
- [14] Asril, Z. (2010). *Micro Teaching*. Jakarta: Rajawali Pers

- [15] Jayanti, & Rahmawati. (2018). "Pembelajaran Menggunakan Teknik Probing Prompting Berbantuan Edmodo Blended Learning Pada Materi Persamaan Diferensial Matematis Mahasiswa Di Universitas PGRI Palembang". *Journal of Chemical Information and Modeling*, 5(5), 458–465
- [16] Lasmo, S. R., Bektiarso, S., & Harijanto, A. (2017). "Pengaruh Model Pembelajaran Inkuiri Terbimbing dengan Teknik Probing-Prompting terhadap Aktivitas dan Hasil Belajar Fisika di SMA". *Jurnal Pembelajaran Fisika* .6(2), 162–167
- [17] Guspatni, G., Andromeda, A., & Bayharti, B. (2018). "Peningkatan Aktivitas Menjawab dan Kualitas Jawaban Mahasiswa dengan Pertanyaan Prompting pada Mata Kuliah Strategi Pembelajaran Kimia". *Jurnal Eksakta Pendidikan (Jep)*, 2(1), 101–107.
- [18] Ge, X., & M.Land, S. (2001). "Scaffolding Student Problem Solving Process Using question prompt and Peer Interaction". *Educational Technology Research and Development*, 51(1), 21–38
- [19] Plomp Tjeerd, & Nieveen, N. (2013). *Educational Design Research Educational Design Research*. Educational Design Research, 1–206.
- [20] Aiken, Lewis R. "Three coefficients for analyzing the reliability and validity of ratings." *Educational and psychological measurement* 45.1 (1985): 131-142.