



Development of Compact Disc (CD) Learning Media Program for Basic Chemistry Course at IAIN Kerinci

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Abstrak: Kimia Dasar adalah mata kuliah wajib dalam Tadris biologi di IAIN Kerinci, yang mempelajari perubahan materi pemisahan campuran, secara fisika, yaitu filtrasi, destilasi, sublimasi, rekristalisasi, dan kromatografi. Tujuan penelitian ini untuk Membuat media pembelajaran dalam bentuk CD Program yang akan digunakan pada pembelajaran kimia dasar materi pemisahan campuran dan mengetahui tingkat validitas dan praktikalitas media pembelajaran kimia dalam bentuk CD Program untuk materi pemisahan campuran. Metodologi dalam Penelitian digunakan adalah Jenis Penelitian, Prosedur Pengembangan, Subjek Uji Coba, Jenis data, Instrumen Pengumpul Data, Teknik Analisis data. media pembelajaran CD Program pada materi pemisahan campuran telah dapat dijadikan media pembelajaran yang layak digunakan dalam pembelajaran kimia materi pemisahan campuran pada mata kuliah kimia dasar di jurusan tadris biologi IAIN Kerinci, dan media CD Program pada materi pemisahan campuran yang dikembangkan sudah valid dan sudah praktis digunakan dalam pembelajaran.

Kata Kunci: Media Pembelajaran, Compact Disc, Program

***Abstrack:** Basic Chemistry is a compulsory subject in Biology Tadris at IAIN Kerinci, which studies the physical changes of material in the separation of mixtures, namely filtration, distillation, sublimation, recrystallization, and chromatography. With the lecture method, in this material, we cannot see directly the changes that occur, so that in this material a practicum is needed to see firsthand the changes that occur. At IAIN Kerinci, there is no special laboratory for chemistry to carry out practicum. Therefore we need media that can describe these changes, so that it will lead to student learning motivation. The purpose of this research was to make learning media in the form of a CD program that will be used in learning basic chemistry of mixed separation materials and to determine the level of validity and practicality of chemistry learning media in the form of a CD program for mixed separation materials. The methodology used in this research was the type of research, development procedures, test subjects, data types, data collection instruments, data analysis techniques. The results of this study indicated that the CD Program learning media on mixed separation materials can be used as suitable learning media for learning chemistry of mixed separation materials in the basic chemistry course in the biology tadris department of IAIN Kerinci, and the CD Program media on mixed separation materials developed is valid. and has been practically used in learning.*

Keyword: Learning Media, Compact disc Program

INTRODUCTION

The National Education Standards mandate that every education unit must develop a curriculum with reference to, among others, Content Standards and Process Standards. Content standards cover the minimum material scope and minimum competency level to achieve minimum graduate competence at certain levels and types of education (Departemen Pendidikan Nasional, 2006). The content standard contains, among others: the basic framework and curriculum structure, which regulates the depth of curriculum content as outlined in competence. The process standard established by Permendiknas Number 41 of 2007 is one of the main references for educational units in the whole process of implementing learning, starting from planning the learning process, implementing the learning process, assessing learning outcomes and supervising the learning process.

In the standard process, professional educators are needed who can make the learning process fun, make students motivated in participating in the learning process. So in the implementation of learning it takes a variety of methods, strategies, and also learning media. Learning media includes tools that are physically used to convey the contents of teaching materials which consist of, among others: books, tape-recorders, films, slides, photos, pictures, charts, graphs, TV, and computers (Gagne and Briggs in Burn, 2005). Learning media can attract and direct students' attention to concentrate on the content of the lesson related to the visual meaning displayed or accompanying the text of the subject matter. Learning media also makes it easier for students to remember and understand the information or messages contained in the media.

Computer-based technology media is a tool used to generate and deliver messages using computer microprocessor-based sources (Arsyad, 2002). Information is stored in digital form using a glass screen to display information. The application of computer-based technology in the chemistry learning process is Computer Assisted Instruction

(CAI) or better known as computer-assisted teaching.

The format for presenting messages and information in CAI consists of programmed tutorials, intelligence tutorials, drill and practice, and simulations. A programmable tutorial is a pre-programmed set of both static and dynamic impressions. Intelligence tutorials differ from programmed tutorials in that computer answers to student questions are generated by artificial intelligence, rather than programmed answers that are pre-prepared by the lesson designer. Drill and practice is used with the assumption that a concept, rule or rule, or procedure has been taught to students. This program guides students with a series of examples to improve proficiency in using the skill. And simulations on computers provide opportunities for dynamic, interactive, and individual learning. With simulation, a complex work environment can be arranged to resemble the real world (Arsyad, 2014). This study uses a programmed tutorial format, where students' answers are analyzed by a computer, and based on the results of the analysis, appropriate feedback.

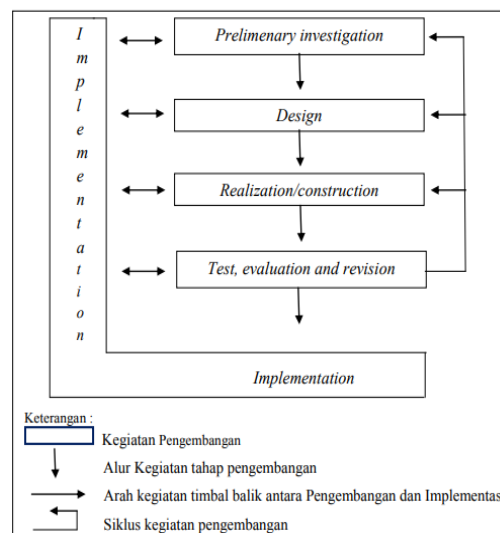
One application of computer-based media is the use of a CD (Compact Disc) Program. This program CD can be displayed via a computer, which contains subject matter consisting of material concepts, animated images that match the material concepts, conclusions, and exercises. The entire content in the program CD is designed and made in such a way that it produces a display with attractive colors that can increase students' learning motivation. Based on the results of observations, it was found that in the basic chemistry course in the biology tadaris department at IAIN Kerinci, students learned about changes in the material for separating mixtures. In this material, the concepts of physical mixture separation are studied, namely filtration, distillation, sublimation, recrystallization, and chromatography. With the lecture method, in this material, we cannot see directly the changes that occur, so that in this material a practicum is needed to see firsthand the changes that occur. At IAIN Kerinci, there is no special laboratory for chemistry to carry out practicum. Therefore

we need media that can describe these changes, so that it will lead to student learning motivation. Based on observations, students still lack motivation and understanding of concepts in the learning process so that a media is needed to increase motivation and understanding of chemical concepts. Based on the results of interviews with chemistry lecturers at IAIN Kerinci, that lecturers teach the material for separating mixtures usually by the lecture method. This is due to the absence of a special chemistry laboratory at IAIN Kerinci, so students cannot carry out experiments with mixed separation materials. In practical work in the laboratory, changes that occur microscopically cannot be observed directly. For this reason, a practical and effective effort is needed as a medium in the process of learning basic chemistry in the biology department. One of them is making a program CD. CD program that contains things that should be observed in the practicum. This study aims to develop a Compact Disc (CD) learning media program for Basic Chemistry courses on the material for the microscopic separation of mixtures at IAIN Kerinci.

METHOD

The design used in this research was development, which produces a new product in learning, namely the Compact Disc (CD) learning media program for Basic Chemistry courses on the material for the microscopic separation of mixtures at IAIN Kerinci. The development model used in this study adapted the Plomp model. The model consists of five phases, namely, 1) initial investigation phase 2) design phase, (3) realization phase, (4) test, evaluation, and revision phase, and (5) implementation phase.

The general model of problem solving in the field of education proposed by Plomp (1997: 5) is described as follows.



RESULTS AND DISCUSSION

Computer-based technology media are tools used to generate and deliver messages using computer microprocessor-based sources (Arsyad, 2002). Information is stored in digital form using a glass screen to submit information. The application of computer-based technology in the chemistry learning process is Computer-Assisted Instruction (CAI) or better known as computer-assisted teaching. CAI can be used in the tutorial learning process, such as drills and practice (exercises to master previously learned material), simulation games (practices to apply newly learned knowledge and skills), and databases (sources that can help students add information).

The advantage of using computers to achieve learning objectives is that computers can stimulate students to do exercises because of the availability of animated graphics, colors, and music that can add to the attractiveness of learning, and control is in the hands of students so that the level of student learning speed can be adjusted to the level of mastery and disadvantages of using computers. for the achievement of learning objectives, namely to use computers required special knowledge and skills about computers, computers are only effective when used by one person or several people in small groups (Arsyad, 2002). This statement encourages researchers to develop CD Program learning media on mixed separation materials. The sparkol videoscribe-based physics learning media, the subject of

motion kinematics, has been successfully developed. 2. The sparkol videoscribe-based physics learning media, the subject of motion kinematics, is stated to be very feasible to use. 3. The sparkol videoscribe-based physics learning media on the subject of motion kinematics was responded to by lecturers and students and was declared very feasible (Pratiwi et al., 2019).

To achieve the research objectives, namely to reveal the validity and practicality of the CD Program learning media on the resulting mixture separation material. Therefore, a series of product validation activities have been carried out by validators and trials on second semester students of Biology Tadris IAIN Kerinci. The following is a discussion of the validity and practicality of the products that have been developed.

1.1 Results of Validation of Program CD Learning Media on Mixed Separation Materials

The CD Program learning media on mixed separation material is a medium used to explain the Learning Outcomes of the Course, namely that students are able to perform mixed separation experiments, namely filtration, distillation, sublimation, recrystallization and chromatography.

The CD Program learning media on the mixed separation material developed must be valid. Learning media is said to be valid if it is in accordance with the material to be taught. The validity measured in this study is content validity and construct validity. The CD Program learning media on the mixed separation material designed is said to be valid in terms of content if it is in accordance with the contents of the IQF curriculum, while it is valid in terms of constructs that can be seen from the consistency of the relationship between components in the learning media.

The validity of the CD Program learning media on the resulting mixture separation material can be known by validation by the validator. In this study, those who were appointed as validators to assess the CD Program learning media on mixed separation materials were two chemistry lecturers. The validation results were then analyzed to determine the validity of the media both from

terms of content feasibility, construct feasibility, linguistic component and graphic component.

Based on the validation data on the feasibility of learning media content in Table 4, it appears that the statements validated by validators I and II have very high validity, namely 0.84. So it can be concluded, in terms of content feasibility, the suitability of the learning media with the curriculum which includes course descriptions, CPMK, and sub CPMK has a very high validity category.

Meanwhile, in terms of the feasibility of the resulting media construction is systematic, because the media is a set of teaching materials that are presented systematically so that it can be used in teaching and learning activities (Depdiknas, 2008: 20). It can be seen from the validation data on the feasibility of learning media construction in Table 5, it appears that the statements validated by validators I and II have very high validity, namely 0.96.

In terms of the accuracy of using language in the learning module, the validity category is very high with a kappa moment of 0.85. Meanwhile, in terms of graphics, Table 7 shows that the statements validated by validators I and II have very high validity, namely 0.94.

From the results of the validation by Validator I, validator I suggested several improvements before the trial, namely adding information to the media and clarifying the image in the experiment. Meanwhile, based on validation by validator II, validator II provides suggestions, namely adding student learning instructions, the voice used must also be clear so that students understand the commands made in the mixed separation experiment.

Based on the validation results by the two validators, it can be concluded that the kappa moment of the CD Program learning media on mixed separation materials is 0.89 with a very high validity category. very high category so that it can be used by lecturers to teach separation material to students for basic chemistry courses.

The validation results from the two validators can be concluded as follows:

- a. The learning media developed are in accordance with the content of the material

and the demands of the KKN curriculum, namely CPMK and sub CPMK to be achieved.

- b. The pictures in the experiment given are in accordance with the material to be taught.
- c. The questions provided in the learning media can help students find concepts.
- d. The exercises provided can help students in consolidating concepts.

1.2 Practical Results of Lecturer and Student Response Questionnaires

The level of practicality of the CD Program learning media on the mixed separation material developed can be seen from the extent to which lecturers and students can use the learning media during the learning process in class. To find out whether the media that is made is practically used or not, a trial was conducted on second semester students majoring in biology at IAIN Kerinci.

In the implementation of learning, the indicator to state that the implementation of this learning media is said to be good is to see whether the components of the learning media can be implemented by the lecturer in classroom learning. The practicality of the media can be seen from the data from the lecturer response questionnaires and student response questionnaires which are processed with the Kappa Cohen formula to obtain kappa values and see the practicality of the media. developed to be practically used in the learning process and assist students in understanding the concepts being studied.

The processing of the kappa moment data (k) for the lecturer response questionnaire can be seen in Appendix 24 page 128 while the kappa moment data processing (k) for the student response questionnaire can be seen in Appendix 25 (page 130). The kappa moment gain (k) presented in Table 8 shows that the practicality category of CD Program learning media on mixed separation materials according to the lecturer is very high, namely 0.84 which means the learning media developed can be used in learning. Although there are a few obstacles in the learning process, which requires computer facilities and infrastructure in the classroom or laptops for each or several students.

The overall interpretation of the practicalities responded to by the lecturers is as follows:

- a. The learning media developed is in accordance with the IQF curriculum.
- b. The media used is in accordance with the CPMK and sub CPMK to be achieved.
- c. The questions are interconnected so that students find it easy to find concepts.
- d. The exercises provided can strengthen students in finding concepts.

In addition to using a practicality questionnaire for the practicality teacher of CD Program learning media on mixed separation materials, students also use a student response questionnaire. Based on Table 9, the kappa moment value of the student response questionnaire is 0.81. This shows that the CD Program learning media on mixed separation materials is practical for use in learning or in other words it is easy and can be used in learning and can help improve student activities in the learning process.

CONCLUSIONS AND RECOMMENDATION

Based on the results of validation data analysis and trial results of the CD Program learning media on the developed mixture separation material, the following conclusions can be drawn, The CD Program learning media on mixed separation material has been able to be used as a suitable learning medium for learning chemistry of mixed separation materials in basic chemistry course at the biology tadaris department of IAIN Kerinci. The CD Program learning media on the mixed separation material developed is valid according to the validator, because it is in accordance with the correct curriculum and concepts and has used good language and the media developed already has a good consistency of relationships between components. The practicality test shows that the CD Program learning media on the mixed separation material developed has been practically used in learning.

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