Development of interactive CD media on processing of continental pastry

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Abstract. The purpose of this research was to produce an interactive CD media on the processing of continental pastry to improve the quality of learning in continental and culinary courses. The quality of media feasibility is based on the assessment of media experts who consider the criteria "good," with the percentage criteria earned at 77.5%. The evaluation of media experts who review the rules "excellent" has a value of 90%. This media can be considered "feasible" as it can be used for learning in terms of media and technical aspects.

1. Introduction

Information technology can be said to have penetrated all areas and to various layers of society. Research trends in technology-enhanced learning (TEL) are divided into two great lines of research. The first is related to technology, including virtual learning environments, game-based education, mobile learning, and learning through communication technologies. The second is related to learning content and includes engineering, mathematics, science, reading, and writing [1]. One kind of teaching process aimed at helping learners to accept the lessons more efficiently is to have the students use their senses as much as possible during studying.

According to Smaldino [2], the media is anything that conveys information from information sources to those who receive information called the media. Media is also used to overcome the limitations of the learners' experience, as it can go beyond the classroom boundaries. There are so many objects that might not be brought into the classroom because the objective is too big, too small, the movement is too slow, the action is too fast to observe, the object too complicated, too soft a voice, and due to obstacles regarding the season or the weather. Also, the media allow for direct interaction of learners with the environment, which generates uniform observation, creates interest and new desires, makes the motivation to learn, and provides a comprehensive experience.

Educators have not been using multimedia learning when teaching about continental cakes. So, it can be said that not utilizing learning media optimally can result in less than the maximum competence of theory and practice [3]. Based on the analysis of students’ needs in the field, according to most learners, processing continental cake is still unfavorable because it is rarely applied in daily life, so this competence requires a more appropriate media to facilitate learners in mastering this competence well. In culinary lessons and courses, many CDs are showing how to manufacture various patisserie products and how to make decorative patisserie products, but these CDs do not satisfy the criteria to serve as
learning media and are not interactive. The factor that influences about student outcomes is instructional media used in the learning process. The instructional media and learning method that match with learning material so influence toward student outcomes [4].

The technique that is used in the delivering materials in instructional media effectively can increase phonological awareness in the learning process [5-8]. Instructional media that benefit viewing and hearing are an excellent way to assist students in the learning process [9]. Based on comparing with the old research, there are too much instructional media that had been developed, like the development of Computer Assisted Instruction (CAI) in the English course [10] and the development of Computer Assisted Instruction on the Math course [11]. Because the subject of Basic Network is a practical subject that the material, not enough explained by lecture only, a teacher also need how to way they can effectively integrate instructional media in the class of learning process [12].

Based on Latifa's research, the result of students learning using interactive multimedia based on Macromedia flash in the form of CDs is higher than the result of student learning using a conventional method on the competence standard identify building science [13]. Besides, it is known that the use of Interactive and Video CD media in the design of educational model about the formation of the toddler's favorite of balanced nutritious food in the mother shows the post-test result of the respondents is more significant than the pre-test result [14].

Due to unavailability of innovative learning media and low competence value of continental cake processing compared to other vocational competencies, and to optimize the utilization of learning facilities available in schools and to answer the challenges of the development of dynamic learning technology, teachers and researchers will try to develop an interactive CD for interactive learning in the classroom study of patisserie and the competence standard on the processing of contemporary cake. Because interactive CDs for interactive learning have advantages such as that they can be played back to the part that learners did not understand well, it can also be used independently, meaning that learning media is useful outside of the classroom as well [15]. Therefore, the use of an interactive CD is expected to make the learning situation more exciting and more fun, resulting in more understanding of cake cooking continental and processing continental cake. Based on the above description, the authors would like to produce an interactive CD media on the processing of continental cake to improve the quality of learning in continental and culinary courses.

2. Research methods
This research uses the Research and Development (R&D) method. Research and Development method is a process series or steps to develop a new product or perfect a product that has been existed so that it can be accounted for [16]. The research was conducted in the Culinary Study Program, Faculty of Engineering, State Jakarta of University, and other culinary institutions such as PT Saf Indonusa and BBC Titan Baking courses. The development is based on the web-based model of ADDIE (Analysis, Design, Development, Implementation, and Evaluation) and ILDF (Integrative learning design framework) [17]. The percentage of validation questionnaire used to determine the quality of media is interpreted in the scores in the table below [18]:

| Percentage | Category        |
|------------|-----------------|
| 0% - 20%   | Not Really Good |
| 21% - 40%  | Not Good        |
| 41% - 60%  | Good Enough     |
| 61% - 80%  | Good            |
| 81% - 100% | Excellent       |

The qualitative data, in the form of criticism and suggestions from material experts, media experts who validated. Then students at the time of the trial were collected and used as a guide to making multimedia
revisions. The quantitative data obtained from the assessment of material experts, media experts, and students were analyzed using qualitative descriptive statistics.

3. Results and discussion

3.1. Development results

3.1.1. Details of the research location. The location used for the development of interactive CD learning media in this research was in the H Building Page located in Housing State University of Jakarta, East Rawamangun Street, East Jakarta. This site featured facilities and infrastructure conducive for learning, such as a library, multimedia room, study room, and instructors, making it possible to incorporate interactive CD learning media. An editor of Sigma TV UNJ, who is an expert in the field of video (audio-visual), assisted.

The interactive CD and videos on the processing of continental cake were developed based on a needs analysis in the field indicating that: (1) current competence standard materials on the processing of continental cake were considered difficult to master by students and course participants; (2) the students want the elements on the processing of continental cake to be offered with more different learning media; (3) many students already have laptops and learning facilities on campus with computer-assisted LCD available in each room so that learning with an interactive CD was possible; and (5) learning with an interactive CD was more exciting and made it easier for students and course participants to learn independently.

3.1.2. Test media expert. At the trial stage of media experts, interactive CD media products and videos were piloted to Mr. Cecep Kustandi, M.Pd, an educational technology lecturer who specializes in assessing instructional media and teaches in the Department of Education Technology at the state university of Jakarta. According to the calculation above, the percentage criterion of 90% is considered to be perfect criteria. This shows that the interactive CD media on continental cake processing aimed at improving the quality of learning in continental and culinary courses is of excellent quality. The high-quality media and technical aspects can be utilized by students, teachers, lecturers, culinary course institutions, or people interested in obtaining various sources of learning to support the learning process, especially on the continental cake. The comments submitted by media experts are (1) boxed well, add usage instructions; (2) add suggestions and conclusions or summaries; and (3) integrate video into an interactive program.

3.1.3. Test of material expert. In this trial stage of the material experts, interactive CD media products and videos on continental cake processing were tested by Dr. Guspri Devi Artanti, M.Si, a culinary lecturer in pastry courses with offices in the Culinary Study Program of the Jakarta State University, who is also an author of the book. The percentage standard result of 77.5% is in the right criteria. In addition to the assessment of material and media, experts also give an evaluation of misinformation, types of errors, suggestions, comments, and feedback to revise or improve the quality of the interactive CD and video products developed.

3.1.4. One to one evaluation. At one to one evaluation, the interactive CD learning media on the processing of continental cake was tested by three people. After the evaluation procedure was concluded, information was obtained, such as error selection of words or less explanatory description and objectives that are not by the material and so forth. The result of the percentage obtained was 91%. In general, the program is very interesting for continental cake learning.

3.1.5. Small-group evaluation. In the small group evaluation, the interactive CD learning media and videos on continental cake processing are tested by ten people simultaneously. The percentage value
obtained was 85%. This indicates that the interactive CD media about the handling of the continental cake was of excellent quality.

3.2. Discussion

3.2.1. Revision. Based on data analysis validation by material experts, developers performed revisions based on improvement suggestions. A correction made on the advice of the material specialist was to add the substance of the presentation to the continental cake processing demo and to replace the word or terms of the material in the pastry, adding the exploratory element of the method and the cake samples. Based on data analysis validation by media experts, developers made several revisions based on suggestions for improvement. Corrections made on the advice of the material expert are as follows: (1) boxed well, add instructions for use; (2) integrate the video into an interactive program; and (3) the summary was corrected redactional; the sentence was more coherent and better.

The results of the product quality assessment from the students on the user trial gave the evaluation a score of "Excellent." They gave a positive and delighted response to this multimedia product. Assessment results were not revised. However, they provided suggestions and feedback, such as multiply the figures and video.

The suggestions for multiplying images were fulfilled by adding a background image to the slide. Still, ideas for adding videos could not be accomplished given the limited capacity of the CD. Since the end product is packaged on CD, the addition of video wasn't possible.

3.2.2. The final product. The final stage in the development of the interactive CD media and video on the processing of continental cake was the copying of the ultimate program onto a CD (Compact Disc) form, which aims to facilitate the distribution.

3.2.3. Explanation of final product. The development of media learning in this patisserie Macromedia director MX program as the leading software. The standard of competence that was provided is mastering the knowledge and skills of continental cake processing, which includes the understanding of continental cake, ingredients in cake making, tools in continental cake making, continental cake processing techniques, continental cake dough type, continental pastry making method, variation, and continental cake-making methods, variations in making cream, and knowledge of examples of continental cooking videos and practice questions.

The interactive CD and the developed continental cake learning video have been through the stages of development, which include: the stages of needs analysis, the development stage of learning design, the product development stage, the product evaluation stage and the final product stage to produce a learning multimedia product worthy of the display aspects, presentation aspects, programming aspects, as well as aspects of learning materials and learning content. Instructional media can assist the student in understanding and applying the learning concepts so that students can reach the learning outcome, and instructional media has a significant opportunity to close student achievement gap than students do not learn by using instructional media [19,20].

The results of observations during the trial revealed that respondents showed high enthusiasm, seriousness, and positive interest in multimedia learning. Most of the users showed interest and perseverance during the process of teaching-learning with multimedia. Users are enthusiastic about following each learning section, especially in the evaluation section, and watching the video to learn to make various kinds of continental pies, chicken pie, eclairs, choux, cream caramel, and cake. The findings of the study revealed that the courseware fulfilled its objectives in aiding students in comprehending the concept of public speaking skills better by using multimedia elements [21].

In addition to student responses and evaluating course participants on the advantages of the above products, a summary of some of the shortcomings of this media product are summarized as follows: (1) practice questions lack variation in the problem type, so more needs to be added; (2) loading for video is rather long, so it needs to be shortened; (3) the figures and videos are still considered to be lacking,
so it needs to be reproduced. This finding suggests that process-oriented spermatogenesis can be audio-visualized into a more comprehensive form of learning media. But this interactive CD product needs further testing to determine consistency and resistance to revisions [22].

Based on the results of the trials described above, it can be concluded that the interactive CD and the continental cake learning video developed in the form of this learning CD would receive a good response in the field and is worthy of use in learning about culinary cake for students and cake course institutes. According to Instructional media based on interactive CD, learning was said effectively to improve students' outcomes because 87.60% of students had reached Minimum Mastery Criteria. Based on the result, it can be concluded that instructional media based on interactive CD learning on Basic Network was useful to use as instructional media on the Basic Network learning process [23]. Through interactive CD learning media, reviewing the process of continental cakes can be done repeatedly until the user masters the material and can make a variety of continental cakes until competent.

4. Conclusion
The resulting product is an interactive CD and video learning about continental cake processing in the form of CD is The quality of media feasibility is based on an expert material assessment on interactive CD products and learning videos on the processing of continental cake as a whole and meeting the "good" percentage criteria. In one to one evaluation of the quality of interactive CD products and learning videos on continental cake processing as a whole, the product meets the criteria of "excellent" and a small group evaluation. Thus, the outcome of multimedia learning of this patisserie said to be "very feasible" when used for instructional media viewed from the aspect of display quality and presentation quality.

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References
[1] Badia A. 2015. Research trends in technology-enhanced learning / Tendencias de la investigación en el aprendizaje favorecido por la tecnología Infancia y Aprendizaje Journal for the Study of Education and Development 38 2 253-278.
[2] Smaldino, Sharon E, dkk. 2012. Instructional Technology And Media For Learning Ninth edition. New Jersey Columbus, Ohio: PEARSON Merrill Prentice Hall
[3] Maciejowska and Frankowicz. 2010. Facilitating Effective Student Learning through Teacher Research and Innovation. DOI: 10.13140/2.1.4684.9925. ISBN: 978-961-253-051-8. Ljubljana: Faculty of Education.
[4] Islami, S. &Yondri, S. 2016. Perbedaan Hasil Belajar Siswa dalam Pembelajaran Kooperatif Tipe Jigsaw dengan Konvensional. In National Conference of Applied Engineering, Business and Information Technology (ASNI-Tech). pp. 414-421.
[5] Foster, K. C., Erickson, G. C., Forster, D. F., Brinkman, D., &Torgensen, J. K. 1994. Computer administered instruction in phonological awareness: Evaluation of the Daisy Quest program. Journal of Research and Development in Education, Vol. 27, pp. 126–137.
[6] Macaruso, P., & Walker, A. 2008. The efficacy of computer assisted instruction for advancing literacy skills in kindergarten children. Reading Psychology, Vol. 29, pp. 266–287.
[7] Mitchell, M. J., & Fox, B. J. 2001. The effects of computer software for developing phonological awareness in low-progress readers. Reading Research and Instruction, Vo. 40, pp. 315–332.
[8] Reitsma, P., &Wesseling, R. 1998. Effects of computer-assisted training of blending skills in kindergartners. Scientific Studies of Reading, Vol. 2, pp. 301–320.
[9] Woo, H. L. 2009. Designing Multimedia Learning Environments Using Animated Pedagogical
Agents: Factor and Issues. Journal of Computer Assisted Learning. Vol. 25, pp. 203-218.

[10] Keengwe, J. 2016. Using Computer-Assisted Instruction to Enhance Achievement of English Learners. Education Information Technology, Vol. 19, pp. 295-306.

[11] Hawkins, R O. 2016. Using Computer-Assisted Instruction to Build Math Fact Fluency: An Implementation Guide. Intervention In School and Clinic, 1-7.

[12] Christensen, R. and Knezek, G. 2016. Relationship of Mobile Learning Readiness to Teacher Proficiency in Classroom technology Integration. 13th International Conference on Cognition and Exploratory Learning in Digital Age. pp 303-306.

[13] Latifa Arina Rizqi. 2014. Pengaruh Penggunaan Multimedia Interaktif Berbasis Macromedia Flash Terhadap Hasil Belajar Siswa Pada Mata Pelajaran Kompetensi Dasar Kejuruan Kelas X Program Keahlian Teknik Gambar Bangunan Smk N 2 Depok. (Skripsi). UNY.

[14] Mutiara Dahlia, Rusilanti, Sachriani, and Nur Risika. 2015. Perancangan Model Pendidikan Tentang Pembentukan Kesukaan Anak Terhadap Makanan Bergizi Seimbang Pada Ibu Berbasis Pemberdayaan Masyarakat. Laporan Akhir Hibah Bersiang Kemenristek Dikti tahun anggaran 2015. LPPM : UNJ.

[15] Dongsong Zhang, Lina Zhou, Robert O. Briggs, Jay F Nunamaker. 2006. Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. Information and Management Journal, 43(1), 15-27. https://doi.org/10.1016/j.im.2005.01.004

[16] Trianto. 2012. Mendesain Model Pembelajaran Inovatif-Progresif. Jakarta: Kencana Predana Media Group.

[17] I Made Tegeh, I Nyoman Jampel, and Ketut Pudjawan. 2014. Model Penelitian Pengembangan. Yogyakarta : Graha Ilmu.

[18] Riduwan. 2011. Skala Pengukuran Variabel-Variabel Penelitian. Bandung : Alfabeta

[19] Wulansari, R. E., Puyada, D., Wijaya, I., Rukun, K. 2017. Effectiveness Of Instructional Media Based Game On Mathematics At Vocational High School. International Journal of Research Science and Management, Vol. 4, Issue 12, pp. 125-128.

[20] Keengwe, J. 2016. Using Computer-Assisted Instruction to Enhance Achievement of English Learners. Education Information Technology, Vol. 19, pp. 295-306.

[21] Abdul Rahim, Azwin Arif 2007 Development and evaluation of a multimedia interactive CD: Public speaking interactive media. In: The Second Biennial International Conference on Teaching and Learning of English in Asia : Exploring New Frontiers (TELiA2), 14-16 June 2007, Holiday Villa Beach & Spa Resort, Langkawi. Faculty of Communication and Modern Languages, Universiti Utara Malaysia, Sintok, pp. 1-15. ISBN 978-983-42061-2-3

[22] M Haviz. 2017. Computer-assisted Biology Learning Materials: Designing and Developing an Interactive CD on Spermatogenesis. IOP Conference Series: Materials Science and Engineering, Volume 335, The 2nd International Conference on Mathematics, Science, Education and Technology 5–6 October 2017, Padang, West Sumatera, Indonesia.

[23] Pernanda, Doni, Mahesi Agni Zaus, Risky Ema Wulansari, and Syaiful Islami. 2018. "Effectiveness of instructional media based on interactive cd learning on basic network at vocational high school : improving student cognitive ability" In Education, Social Sciences and Technology Application in Digital Era, edited by Ifdil Ifdil, and Zadrian Ardi, 443 - 447, Padang: Fakultas Ilmu Pendidikan UNP. doi:10.29210/2018163.