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e-Module Development Instruments on The Topic of Free-range Chicken Eggs Productivity as Lessons for The Covid-19 Pandemic Era

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Abstract: e-Module Development Instruments on the Topic of Free-range Chicken Eggs Productivity as Lessons for the Covid-19 Pandemic Era. The purpose of this study was to determine the instrument for the Development of an e-Module for Integrated Chemistry Learning STEM Subject Entrepreneurship Topic Productivity of Free-range Chicken Eggs as a Lesson in the Era of the Covid-19 Pandemic, valid and practical. Respondents of this study were students and lecturers of Chemistry Education FKIP Sriwijaya University. The results of the expert review show the average value of Aiken's coefficient on the material aspect: 0.90; pedagogic: 0.93; and practicality: 0.94 is in the high category. The results showed that the e-module validation instrument had met the valid and practical criteria.

Keywords: e-module, Free-range Chicken, covid-19

Abstrak: Instrumen Pengembangan e-Modul Topik Produktivitas Telur Ayam Buras Sebagai Pembelajaran Era Pandemi Covid-19. *Tujuan penelitian ini adalah untuk menentukan instrumen Pengembangan e-Modul Pembelajaran Kimia Terintegrasi STEM Mata Kuliah Kewirausahaan Topik Produktivitas Telur Ayam Buras sebagai Pembelajaran Era Pandemi Covid-19, yang valid dan praktis. Responden penelitian ini adalah mahasiswa serta dosen Pendidikan Kimia FKIP Universitas Sriwijaya. Hasil expert review menunjukkan rata-rata nilai koefisien Aiken's pada aspek materi: 0,90; pedagogic: 0,93; dan kepraktisan: 0,94 termasuk kategori tinggi. Hasil penelitian menunjukkan bahwa instrumen validasi e-modul yang dihasilkan telah memenuhi kriteria valid dan praktis.*

Kata kunci: *e-module, Ayam Buras, covid-19*

- **INTRODUCTION**

Learning at the Sriwijaya University Chemistry Education Program faces problems, including 1) There is no direct face-to-face due to the covid-19 pandemic 2) the need for valid and practical validation instruments for the development of e-modules on the topic of increasing native chicken egg productivity, as a follow-up to suggestions from the research results of Desita (2021) and Tias (2021); 3) There is still a lack of teaching materials, especially modules for entrepreneurship courses; 4) Entrepreneurship courses are important in supporting the program of the Minister of Education, Culture and Research, namely Merdeka Learn Campus Merdeka (MBKM). 5) The nation will progress if the number of entrepreneurs is at least 2%.

This research will be useful for students' knowledge of entrepreneurship, improving learning outcomes in entrepreneurship courses, the success of the Merdeka Learning Campus Merdeka (MBKM) program and as a reference in broader entrepreneurship.

In online learning, the media that are often applied in learning are online learning media such as e-learning and whatapps group, both media can be used in the process of developing modules and e-modules along with e-module instruments for chemistry learning.

Currently, there are 400,000 entrepreneurs (0.18) in Indonesia, while a country needs as much as 2% of its population to become entrepreneurs so that the country becomes a developed country (Mulyani, 2011; Santoso, 2013). One of the strategies launched by the government to improve this is to make entrepreneurship a subject in higher education, so that university graduates do not only want to become state civil servants. And Sriwijaya University is very supportive of this, so that activities related to entrepreneurship are often carried out.

Entrepreneurship learning can grow the soul into creative, innovative and productive individuals. Besides that, entrepreneurship learning is not just theory and practice in schools but must be implemented in real life everyday. Every activity, whether consciously or not, has a purpose, especially entrepreneurship learning activities. In entrepreneurship learning, students are taught and inculcated behavioral attitudes to open a business so that they can become talented entrepreneurs.

Entrepreneurial ability is one of the factors to develop an entrepreneurial spirit, such as being independent, daring to take risks, being able to seize existing opportunities, being creative and innovative. It is necessary to cultivate the entrepreneurial spirit of students, so that they can prepare themselves for entrepreneurship. The empowerment of production units in schools has not been carried out optimally, has not been carried out properly, so that our students can actually gain real experience in the world of work, which can motivate themselves by having enthusiasm, attitudes, behavior, abilities, and creativity in managing and developing effort. Entrepreneurial interest is the ability to take the courage to meet the needs of life and solve life's problems, promote business or create new businesses with the strengths that exist in oneself. Entrepreneurial interest is a psychological symptom to focus attention and do something about the entrepreneur with a feeling of pleasure because it brings benefits to him. Entrepreneurship is something that grows because of a high willingness to carry out activities without having to feel burdened by these activities because when interest is in us, we have to control what things we will do when the interest grows in us so that from interest With that, we can do what stages we have to do in starting entrepreneurship.

Students who have an entrepreneurial interest mean that they have the will to succeed in entrepreneurship. In order to be successful, ask the entrepreneur to continue to be developed so that later it cannot be realized properly. According to Hamdani (2010) states that the first eight steps that must be taken in developing an interest in entrepreneurship are: 1) Dare to start, meaning that there is no need to wait and delay time in entrepreneurship; 2) Dare to take risks means not afraid if you fail in entrepreneurship and continue to be entrepreneurship; 3) Full calculation means not acting rashly in making a decision related to the continuity of a business; 4) Having a clear plan means that an entrepreneur must be able to compile; 5) Not quickly satisfied and desperate means that an entrepreneur is required to continue to have progress and not be satisfied with something quickly; 6) Optimistic and full of confidence means that every action and deed must be accompanied by an optimistic attitude; 7) Having responsibility means that entrepreneurs are always responsible for all parties; 8) Having ethics and morals means having ethics and morals as a bulwark for entrepreneurship to be successful.

In detail, the benefits of entrepreneurship learning are as follows: 1) Increase high entrepreneurial motivation so that you can useful for future; 2) Take advantage of the potential and make changes that exist within a person; 3) Cultivate the spirit, attitude, behavior and entrepreneurial skills that are reliable and superior among students and Public; 4) Developing potential and training skills in entrepreneurship; 5) The growth of thinking and working hard among students by creating products that are in accordance with existing purchasing power.

The scope of entrepreneurship learning according to Suherman (2010, p.22) includes matters relating to: a. Understanding of the concept of entrepreneurship; b. Formation of entrepreneurial spirit; c. Self-development; d. Entrepreneurial techniques; e. Business management aspects; f. Marketing, sales and risk optimization techniques; g. Creativity, innovation, leadership and communication; h. Steps to enter the business world; i. Fundamentals of economics; j. Business development; k. Feasibility study; l. business ethics.

There are 9 titles in the entrepreneurship course in the chemical education study program at the University of Sriwijaya, and 5 more titles are needed to meet the needs of 1 semester. Therefore, in order to fulfill this, it is necessary to developthe title of the new module, namely e-Modul with a STEM approach Topic of Increasing the Productivity of Free-range Chicken Eggs.

• METHOD

This study uses the ADDIE development model and Tessmer formative evaluation. The Tessmer's formative evaluation stage in this research are:

Expert Review

Material validation instruments, pedagogy, and practicality were developed at this stage. In addition, at this stage, the e-module draft design was carried out which was evaluated independently (self evaluation) by the researcher, so that a specific prototype of the e-module draft was produced. Furthermore, the questionnaire instrument and specific prototype were given to experts in the Chemical Education study program at Sriwijaya University to be assessed for validity. The Aiken coefficient formula is used to analyze the validation results.

One-to-One

Practical trials of specific prototype draft e-modules and practicality questionnaires were carried out by walkthrough to individual students. The practicality/design questionnaire data were analyzed using the Aiken Coefficient

Small Group

The practicality test is carried out at this stage, where group of students given the specific prototype e-module draft and practicality questionnaire.

- **RESULT AND DISCUSSION**

The results and research procedures for the tesmer evaluation of e-module are:

Expert Review

In this step, validation by experts is carried out on the *specific prototype* and draft instrument validity for aspects of material, pedagogy, and practicality. Experts who validated in this study consisted of 2 lecturers with the initials ARI and MEH.

Validation results The material validation questionnaire, pedagogic validation and practicality questionnaires which have been analyzed with the Aiken coefficient of the two validators show the following results respectively 0.90; 0.93 and 0.94, which are included in the high validity category because they fall into the 0.80-1.00 range which is the high category range. (Aiken's 1985). The result of expert review as follows:

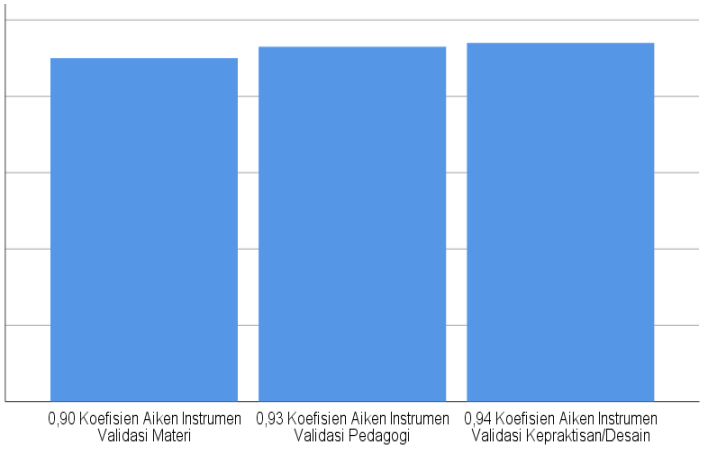


Figure 1. The Expert Review Result

Aspects of matter validation instruments are 1) The suitability of the material; 2) The suitability of the material with the learning outcomes of the subject; 3) The accuracy of the questions; 4) Chemical accuracy; 5) Extensiveness of chemical material in internet media; 6) Accuracy of chemicals matter.

Aspects of pedagogy validation instruments are 1)The suitability final ability of each learning stage; 2) The suitability of the learning steps; 3) Relevant to presentation; 4) Compliance with language rules; 5) Cultivating Creativity; 6) Learning in modules according to STEM steps; 7) STEM components; 8) Learning in e-modules according to STEM steps; 9) Learning in modules according to STEM steps; 10) Learning in e-modules is in accordance with the Covid-19 pandemic era.

Aspects of design and practicality validation instruments are 1) Attractiveness; 2) Cover/cover of e-module; 3) The suitability of the letters used; 4) Writing display; 5)

Writing display; 6) Usagelanguage/sentence;7) Presentation of tables/figures;8) Color composition;9) Balance the position of the layout (title, author and logo).

Expert assessment of the Specific prototype is presentedin the following image:

The Beginning

Petunjuk :

1. Berikan tanggapan Bapak/Ibu dengan memberikan nilai pada kc
   memberikan tanda (√) pada kolom skor yang disediakan dengan ke
   4 = Keempat deskriptor muncul pada e-modul
   3 = Hanya 3 deskriptor muncul pada e-modul
   2 = Hanya 2 deskriptor muncul pada e-modul
   1 = Hanya 1 deskriptor muncul pada e-modul atau tidak ada des
2. Komentar/Saran/Kritik yang diberikan untuk memperbaiki modul

No	Indikator		Deskriptor	(√
1	Kesesuaian materi dengan kemampuan akhir tiap tahap belajar pada e-Modul Topik Peningkatan produktivitas telur ayam Buras	1	Materi yang disajikan sesuai dengan Sub CPMK 1	
		2	Materi yang disajikan sesuai dengan Sub CPMK 2	
		3	Materi yang disajikan sesuai dengan masalah nyata	
		4	Materi yang disajikan sesuai	

The revision

Petunjuk :

1. Berikan tanggapan Bapak/Ibu dengan memberikan nilai pada kolo
   memberikan tanda (√) pada kolom skor yang disediakan dengan keter
   4 = Keempat deskriptor muncul pada modul
   3 = Hanya 3 deskriptor muncul pada modul
   2 = Hanya 2 deskriptor muncul pada modul
   1 = Hanya 1 deskriptor muncul pada modul atau tidak ada deskript
2. Komentar/Saran/Kritik yang diberikan untuk memperbaiki e-modul

No	Indikator		Deskriptor	(√)
1	Kesesuaian materi dengan kemampuan akhir tiap tahap belajar pada e-Modul Topik Peningkatan produktivitas telur ayam Buras	1	Materi yang disajikan sesuai dengan Sub CPMK 1	
		2	Materi yang disajikan sesuai dengan Sub CPMK 2	
		3	Materi yang disajikan sesuai dengan masalah nyata	
		4	Materi yang disajikan sesuai	

Figure 2. Revision of the Material Validation Instrument

The expert advises for the consistency of the use of words, so then it is not confusing and does not have multiple meanings. So that the word e-module is used in its entirety in the instrument.

The Beginning

2. Komentar/Saran/Kritikyang diberikan untuk memperbaiki m

No	Indikator		Deskriptor
1	Kesesuaian materi dengan kemampuan akhir tiap tahap belajar pada Modul Topik Peningkatan produktivitas telur ayam Buras	1	Materi yang disajikan sesuai dengan Sub CPMK 1
		2	Materi yang disajikan sesuai dengan Sub CPMK 2
		3	Materi yang disajikan sesuai dengan masalah nyata
		4	Materi yang disajikan sesuai dengan pemikiran logis
2	Kesesuaian materi dengan CPMK 2 pada Modul Topik Peningkatan produktivitas telur ayam Buras	1	Materi yang disajikan dalam modul sesuai dengan pemikiran kritis
		2	Konsep-konsep yang disajikan dalam modul, inovatif
		3	Fakta-data sudah sistematis

The revision

2. Komentar/Saran/Kritikyang diberikan untuk memperbaiki n

No	Indikator		Deskriptor
1	Kesesuaian materi dengan kemampuan akhir tiap tahap belajar pada Modul Topik Peningkatan produktivitas telur ayam Buras	1	Materi yang disajikan sesuai dengan Sub CPMK 1
		2	Materi yang disajikan sesuai dengan Sub CPMK 2
		3	Materi yang disajikan sesuai dengan masalah nyata
		4	Materi yang disajikan sesuai dengan pemikiran logis
2	Kesesuaian materi dengan CPMK 2 pada Modul Topik Peningkatan produktivitas telur ayam Buras	1	Materi yang disajikan dalam e-modul membuat mahasiswa kreatif
		2	Konsep-konsep yang disajikan dalam modul, inovatif
		3	Fakta-data sudah sistematis

Figure 3. Revision of the word

The word creative is one of the characteristics of the STEM approach, therefore the critical word in the e-module is changed to the word creative.

The Beginning	The revision
C. **Kompetensi, Indikator dan Tujuan Perkuliahan** Kompetensi, Indikator dan Tujuan Perkuliahan Tujuan akhir yang dicapai setelah menyelesaikan modul ini tertuang pada tabel sebagai berikut: **Tabel Kompetensi, Indikator dan Tujuan Perkuliahan.** Kompetensi / Indikator / Tujuan Perkuliahan Mengerjakan soal *pretest* — Sebelum perkuliahan mahasiswa mengerjakan soal test awal Menganalisis jenis wirausaha yang mungkin dapat dikembangkan sesuai dengan minat. — Dari *brosing* internet mahasiswa dapat merancang usaha yang diminatinya Judul wirausana — Dari *brosing* internet mahasiswa dapat menyusun judul wirausaha yang diminatinya	D. Capaian Pembelajaran Mata Kuliah (CPMK) Mahasiswa mampu menunjukkan sikap tanggungjawab untuk memahami Kuliah Kewirausahaan (CPMK 1). Mahasiswa mampu menerapkan pemikiran logis, kreatif, sistematis, inovatif, dalam konteks peranan berwirausaha dalam kehidupan sehari-hari kaitannya dengan masalah nyata mengenai peningkatan produktivitas telur ayam buras (CPMK 2). Mahasiswa mampu membuat rancangan usaha pembudidayaan ayam buras petelur dengan beberapa jenis pakannya.

Figure 4. One of the revison

One-to-one

In the one-to-one stage, 3 students representing low, medium and high cumulative grade point averages (GPA) with the initials AA, PR and IN were included as respondents at this stage. The practicality validation instrument was filled in by the 3 students. And a walkthrough was also carried out to get comments from the 3 students on the specific prototype e-module. The revision of this stage as follows:

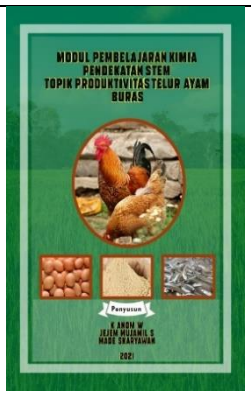
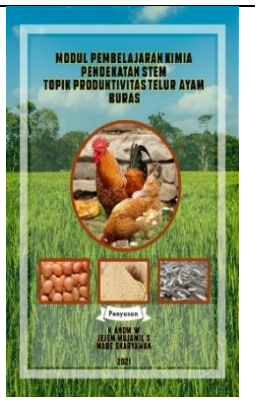
The Beginning	The revision
	

Figure 5. The revision of design

Design revisions at this stage are carried out on the e-module cover. Where added brightness on the cover so that it is more bright in color. The results of this stage called *prototypes I.*

Small Group

In the small group stage, the 9 participating students were formed into 3 groups where each group consisted of 3 students were chosen randomly. The revisions of this stgae are as follows:

The Beginning	The revision
O. Tugas Mahasiswa Bacalah wacana di bawah ini! Tulislah 13 langkah dalam e-modul pembelajaran kimia pendekatan *STEM* Mata Kuliah Kewirausahaan di Pendidikan Kimia FKIP Universitas Sriwijaya? P. Umpan Balik	Jika ayam buras betina akan mengeram maka mandikan ayam buras betina ini, maka ayam buras betina itu tidak jadi mengeramnya dan bertelur kembali. O. Tugas Mahasiswa Bacalah wacana di bawah ini! Tulislah 13 langkah dalam e-modul pembelajaran kimia pendekatan *STEM* Mata Kuliah Kewirausahaan di Pendidikan Kimia FKIP Universitas Sriwijaya? P. Umpan Balik Jika Anda telah mengerjakan soal-soal di atas, maka hitunglah nilai yang

Figure 6. The revision of the Small Group Test.

Figure 6 shows the revised results of the Small Group Test, students as users suggest to use Times New Roman style with a size of 12, which aims for consistency in writing letters.

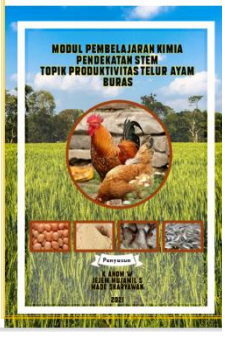
The Beginning	The revision
	

Figure 7. The revision of word in cover

Figure 7 shows the revised results of the suggestions in the small group test, which shows that the font used in the title should be the same.

This e-module as a teaching material that has been developed with a good scientific process will help students in self-study, to improve learning outcomes, especially in entrepreneurship courses and also to improve students' abilities in planning a business. Thus, after this validation process has been carried out, it is necessary to conduct a limited trial of the e-module. this is done to improve the quality of the e-module so that it really fits the needs of students.

Therefore, this e-module is ready to be used in the limited trial phase. With the development of e-modules for entrepreneurship courses, it is hoped that students will be motivated to improve their abilities in making business plans that they can do either as current students or later after graduating from university. Careful planning in starting a business will be a good capital to achieve good results.

• CONCLUSION

Based on the results and discussion, then the material validation instrument, pedagogy and practicality developed are classified as high validity categoryi, with each of Aiken's coefficients respectively being 0.90; 0.93; and 0.94.

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• REFERENCES

Aiken, L. R. (1985). Content Validity and Reliability of Single Items or Questionnaires. *Educational and Psychological Measurement*: 955-959

Berry, M., Chalmers, C., & Chandra, V. (2012). *STEM* future and practice, can we teach *STEM* in a meaningful and integrated way. *2nd International STEM in Education Conference* (p. 225-240). Brisbane: Queensland University of Technology.

Depdiknas. (2008). *Panduan Pengembangan Bahan Ajar*. Jakarta: Dirjen Manajemen Dikdasmen SMA.

Capraro, R. M., Capraro, M. M., Morgan, J. R., & Slough, S. W. (2013). *STEM Project-Based Learning: An Integrated Science, Technology, Engineering, and Mathematics (STEM) Approach. STEM Project-Based Learning an Integrated Science, Technology, Engineering, and Mathematics (STEM) Approach.* http://doi.org/10.1007/978-94-6209-143-6

Desita, D.F.S., Anom, K.W., Ad"hiya, E., (2021). Kebutuhan e-Modul Produktivitas Telur Ayam Buras Sebagai Pembelajaran di Era Pandemi Covid-19. *Prociding Seminar Nasional IPA di Palembang.*

Firman, H; (2017), *STEM* untuk Pembelajaran kimia Abad ke-21, Seminar National Pendidikan Kimia (tidak dipulikasikan)

Madyani, I., Yamtinah, S, Utomo, S.B., (2019). The implementation of PBL integrated with STEM in the material of Temperature and Its Changes to the Improvement of Students' Creative Thinking Skills and Learning Results. *Journal of Educational Science and Technology JEST*. 5(3): 260--267 DOI: https://doi.org/10.26858/est.v5i3.10899

Mardhiya, J., (2021). Pembelajaran *Online* di Program Studi Pendidikan Kimia : Survei Kesiapan Mahasiswa. *Journal of The Indonesian Society of Integrated Chemistry*.13 (1):21—31

Menteri Pendidikan, Kebudayaan, dan Riset. (2020). Penjelasan Menteri Pendidikan, Kebudayaan dan Riset tentang kewirausahaan sebagai kegiatan mahasiswa dalam Merdeka Belajar kampus Merdeka tanggal 24 Januari 2020

Muhaimin, A., (2020) Penerapan Project Based Learning dengan Pendekatan STEM dalam Upaya Meningkat Kemampuan Menyusun Program CNC Pada Kelas XI

Teknik Pemesinan SMK Negeri 3 Mataram. *Journal of Classroom Action Research.* 2(2)

Mulyani, E., 2011 " Model Pendidikan Kewirausahaan di Pendidikan Dasar dan Menengah," *J. Ekonomi & Pend*., 8**(**1):1—18

Prastowo. A. (2011). *Panduan Kreatif Membuat Bahan Ajar Inovatif*. Bandung: Diva Press.

Putri, C.D., Pursitasari, I.D., Rubini, B., (2020). *Problem Based Learning* Terintegrasi *STEM* di Era Pandemi Covid-19 untuk Meningkatkan Keterampilan Berpikir Kritis Siswa. *Jurnal IPA dan Pembelajaran IPA* (program Pasca Sarjana Universitas Syiah Kuala). 4(2): 193—204
DOI: https://doi.org/10.24815/jipi.v4i2.17859

Salsabila, N dan Nurjayadi, M. (2019). Pengembangan Modul Elektronik (e-Module) Kimia berbasis Kontekstual sebagai Media Pengayaan pada Materi Kimia Unsur. *Jurnal Riset Pendidikan Kimia Aricle.* 9(2): 103—111. DOI: https://doi.org/10.21009/JRPK.092.07

Santoso, D. (2013). *Modul Pembelajaran Kewirausahaan.* Jakarta: Direktorat Jenderal Pembelajaran dan Kemahasiswaan Ditjen Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan

Sarilawati, D. (2021). Authentic Assessment in The Pandemic Period. *Journal of The Indonesian Society of Integrated Chemistry.*13 (1):21--31 DOI: https://doi.org/10.22437/jisic.v13i1.11716

Septryanesti, N., dan Lazulva. (2019). Desain dan Uji Coba E-Modul Pembelajaran Kimia Berbasis Blog Pada Materi Hidrokarbon. *Jurnal Tadris Kimiya* 4(2)): 202-215

Tessmer, M. (1998). *Planning and Conducting Formatif Evaluation*. Philadelphia: Koganhttps://doi.org/10.22437/jisic.v13i1.12263

Tias, W.N., Anom, K.W., Ad"hiya, E., (2021). Kurikulum E-Modul Produktivitas Telur Ayam Buras Sebagai Pembelajaran di Era Pandemi Covid-19. *Prociding Seminar Nasional IPA di Palembang.*

Widiyani, D.T., Amilia, F., dan Susetyo, A.M. (2021). Indikator Pembelajaran Efektif dalam Pembelajaran Daring (Dalam Jaringan) pada Masa Pandemi Covid-19 di SMAN 2 Bondowoso. *Jurnal Universitas Muhammaduyah Jember 1-1*