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CIPP Model for Curriculum Evaluation of Biology Education

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ABSTRACT
The aim of this study to describe the results of evaluating the implementation of the curriculum in the Biology Education Study Program. This research is an observational study. Observations were made on Biology Education courses. The model used is CIPP (Context, Input, Process, and Product). Data collection related to documents and observations is carried out with reference to relevant instruments based on the CIPP model components including survey / observation instruments, interview sheets, questionnaire sheets, and curriculum document review sheets and learning support tools. Furthermore, conducting a Focus Group Discussion (FGD). The trend analysis model technique uses nominal data, starting with the frequency distribution as outlined in the diagram. For the response questionnaire, various analysis of frequency distribution and dependency analysis were developed. The results of direct observation were analyzed by quantitative descriptive analysis. Data from interviews or focus group discussions were analyzed by explaining the meaning and making interpretations. The results of research on the evaluation of the Biology Education study program curriculum based on the CIPP model showed that effective results in terms of context, input, process, and product. Planning until the curriculum product has been carried out produces graduates according to the study program profile. The target of increasing international standards is an achievement in the future.

Keywords: *Curriculum evaluation, CIPP model, biology education*

1. INTRODUCTION

The curriculum is a set of plans and arrangements for graduate learning outcomes, study materials, processes, and assessments that are used as guidelines for implementing study programs. The curriculum includes learning outcomes, learning materials, learning processes, and assessment and assessment. The Faculty of Mathematics and Natural Sciences, Universitas Negeri Surabaya (Unesa) has developed a curriculum document that adopts and adapts the latest trends and regulations such as the development of science, technology and arts, demands of the 21st century, Presidential Regulation Number 8 of 2012 concerning the Framework Indonesian National Qualification (namely KKNI) [1], Permenristekdikti Number 44 of 2015 concerning national higher education standard (namely SNPT), and has been designed to provide relevant experience for students, so that a written curriculum is created. The curriculum document then becomes a reference for implementation in the actual curriculum.

The curriculum developed and implemented at Faculty of Mathematics and Natural Sciences Unesa is based on Presidential Regulation Number 08 of 2012 concerning the KKNI and Permenristekdikti Number 44/2015 concerning SNPT and refers to the Unesa Statute, Unesa's Strategic Plan 2016-2020 and also the 2016-2020 Faculty of Mathematics and Natural Sciences Strategic Plan. This curriculum referred to as the SNPT-based curriculum which accommodates KKNI.

In principle, the implemented curriculum is a curriculum developed based on the principles of curriculum development, which is relevant to the demands, needs and development of society, as well as being relevant between the objectives, content, delivery process, and assessment. Other principles that must also be considered are flexibility, continuity, practicality and efficiency. The principle of effectiveness, which is a measure of the success of curriculum implementation, is also the main focus for always developing curriculum. The effectiveness of a curriculum can be viewed from the aspect of quantity, namely the availability and readiness

of curriculum components. While the success of quality can be seen from the results of implementing the curriculum. One of the models used is the CIPP (Context-Input-Process-Product) model. The advantages of the CIPP evaluation model are as feedback on the implementation of the teaching process and learning outcomes that have been carried out and the results of this feedback become a benchmark for further process improvement [2]. The same opinion [3], that the CIPP model has the advantage of evaluating the context, input, process, and product stages in order to decision making (formative role) and presentation of information on accountability (summative role).

Biology Education Study Program since the 2015/2016 academic year has implemented the KKNI-based curriculum for the Undergraduate Biology Education study program. Implementation of the curriculum has begun with the development of supporting documents as a whole. Changes in the curriculum documents in the Biology Education Study Program were carried out in the 2018/2019 academic year which accommodates the demands of education 4.0, national, regional and international accreditation/certification, and the demands of the education world that lead to Outcome Based Education (OBE) so that a curriculum revision is produced to accommodate the demands OBE.

During a period of four years of curriculum implementation since its enactment in the 2015/2016 academic year and one year of implementing the revision of OBE demands, it is deemed necessary to conduct an evaluation, especially in the learning process. Periodic evaluation of curriculum implementation has been carried out by the Quality Assurance Unit of Faculty of Mathematics and Natural Sciences through lecture monitoring activities in two courses per semester. The results of monev will provide an overview of the lecture process from preparation to lecture implementation. However, how the overall learning outcomes of students whose lecture process is based on the curriculum used have not been described in detail. In addition, the implementation of the curriculum in the Biology Education Study Program of Unesa between 2015-2017 was effective [4]. However, this research has not taken a complete description until the scholar graduation in the five year period.

This study will provide a detailed description of the implementation of the curriculum in the Biology Education Study Program, specifically it is expected to measure the effectiveness of the curriculum. The Stufflebeam CIPP evaluation model can be used. This model has been used and designed not only to prove a decision but to act as a problem solver where the information can be used as a guide for program design [5]. Therefore, the purpose of this study is to describe the effectiveness of curriculum implementation in the Biology Education Study Program using the CIPP model.

2. METHOD

This research is an evaluation research, namely through the observation of all documents and the lecture process as a form of curriculum implementation. Observations were made in the Biology Education study program. The model used a CIPP (Context, Input, Process, and Product).

a. Contecxt includes backgrounds or situations that affect the goals and strategies for implementing the curriculum,

b. Input includes the means / capital / materials and a strategic plan that is set to achieve curriculum goals,

c. Process includes the implementation of strategies and the use of facilities / capital / materials in curriculum implementation,

d. Product includes the results achieved in the process or the end of curriculum implementation.

The approach taken is to compare the performance of the internal and external system dimensions of the Biology Education Study Program. The data structure for monitoring and evaluating the implementation of the Biology Education Study Program curriculum is in Table 1.

Table 1. Aspects and focus of curriculum evaluation

Aspect	Focus
Context	• Development of curriculum tools • Teaching • Teaching material • Teaching media • Laboratory activity • Assessment
Input	• Student abilities • Lecturers' qualification and abilities • Periodic monitoring and evaluation activities on the curriculum • Work environment
Process	• Curriculum evaluation planning • Implementation of learning and learning facilities / infrastructure services • Reflection
Product	• Performance of lecturers and staff as well as support for facilities / infrastructure • Student learning outcomes improvement • Leader responses

The determination of data collection procedures is based on the components of the CIPP model includes survey / observation instruments, interview sheets, questionnaire sheets, and curriculum document review sheets and learning support facilities/ infrastructure. Furthermore, conducting a Focus Group Discussion (FGD) in an effort to validate the research results. Thus, the data to be obtained is in the form of numbers, it can

be nominal and it can also be an interval. The following are the instruments used to capture data in this study:

1) Interview instrument for curriculum implementation for lecturers, students, staff and department / study program leaders
2) The learning implementation observation instrument
3) Instrument reviewing curriculum documents and learning facilities / infrastructure
4) The appropriateness of the graduate questionnaire / questionnaire with the study program profile

Data analysis that will be carried out is related to the type of data obtained through the instrument being developed. The trend analysis model technique, if using nominal data, starts with the frequency distribution as outlined in the diagram. For the response questionnaire, various analysis of frequency distribution and dependency analysis were developed. The results of direct observations were analyzed descriptively quantitatively. Data from interviews or focus group discussions were analyzed by explaining the meaning and making interpretations.

3. RESULTS AND DISCUSSION

3.1. Context

This evaluation includes a background or situation that affects the goals and strategies for implementing the curriculum for the Biology Education Study Program, including curriculum development, learning, teaching materials, teaching media, laboratory activities, and assessment.

The curriculum is a quality objective set out in the study program's strategic plan with Curriculum Restructuring activities through syllabus updating workshop activities and lecture program units, as well as curriculum review workshops. The aim is to update the syllabus and lecture program units according to the KKNI. The output of the activity is the curriculum development results: Vision, Mission, Objectives, Competence of Graduates, Curriculum Structure, Curriculum Map, Course Description, Syllabus and Semester Learning Plan. More specifically, it aims to achieve conformity to the KKNI curriculum as a result of the review with the needs of stakeholders, professional needs and society.

Learning, teaching materials, learning media, laboratory activities, and assessments are planned based on the achievement of the objectives of the study program to produce biology educators, researchers in the field of biology education, and entrepreneurs in the field of education. All aspects of the context are goal oriented. Good planning within the faculty or study program can help develop a more knowledgeable faculty, which is expected to become a more effective role model [6].

3.2. Input

This evaluation includes the means / capital and a strategic plan that is determined to achieve the curriculum objectives including student abilities, qualifications and abilities of lecturers, periodic monitoring and evaluation activities of the curriculum, and working conditions. The ability of students about the learning concepts obtained shows that students understand what is learned during lectures. Motivation to learn increases based on the responses obtained from the motivation questionnaire. Students' perceptions about the curriculum described in the subject indicate that it is in accordance with daily conditions in lectures.

Lecturer aspect is in accordance with the qualifications and competences of the field being mastered. Thus, all lecturers are eligible to teach the subjects taught to students. The planning aspects of curriculum monitoring have been formulated by the quality assurance unit in each semester. The implementation of the curriculum is strictly controlled based on documents and application in learning. In different cases, the level of education and the educational environment have an effect on the results of the curriculum evaluation [7].

Learning environment is adjusted to the minimum standard of eligibility which includes safety, health, comfort, security, and laboratory waste installation. The results of the external audit indicate that the overall work environment is adequate for use in achieving learning objectives.

3.3. Process

The results of this evaluation include the implementation of strategies and the use of facilities / capital in curriculum implementation using the document review method and interviews with students, lecturers, and supporting education staff.

Biology Education study program has managed various activities for strengthening and evaluating the academic field so that the quality of the learning process can be maintained very well and even improved, including 1) compiling a study program curriculum referring to the academic text of the university curriculum and the latest developments, 2) assigning lecturers to conduct courses Thesis advisors and examiners are in accordance with the scientific clumps and competence of lecturers, 3) compile a mapping of skill clumps and competences of study program lecturers according to operational plans, 4) map students who do field practice (including determining supervisors), and

coordinate the implementation of supervision of field practice performance.

Learning implementation and supporting facilities have been used in the learning process. Lecturers serve learning to students based on student center learning, innovating, and living the values of attitudes and character. Another case allows for deficiencies in the application of the curriculum, but lecturers and students generally have positive ideas towards curriculum perfection [8]. The institution maintains the implementation of a quality culture, the implementation of various programs in the field of teaching and education refers to various guidelines regulated by the university, including Curriculum Academic Manuscripts and Curriculum Development Guidelines, Learning Guidelines, Assessment Guidelines, Learning Management Program Guidelines, General Education Guidelines, Character Development Guidelines, and Guidance Counseling Service Guidelines.

Education system needs to provide quality education and proper facilities for students [9]. The results of reflection in the curriculum process show that all components of the study program recognize the importance of regularly improving the curriculum in accordance with the development and skills needs of graduates. Ideally, overall curriculum improvement is carried out within a maximum span of 4 years.

3.4. Product

Lecturers validate semester learning plans and exam questions that are carried out between lecturers in clumps. Validation is carried out using a validation sheet as an instrument prepared by the quality assurance unit. The validation is aimed at maintaining and improving the quality of lectures in a structured and scheduled manner each semester. The existence of team teaching plays a role in strengthening the course material to obtain student learning outcomes as stated in the learning design. The results of student learning outcomes (academic and non-academic) showed an increase in the cumulative grade point index of 7% and non-academic achievement. This achievement is due to intensive lecturer mentoring to students. The result of the percentage of suitability in the field of work with graduate expertise is 95%, with the distribution of graduates being 81% in the education sector (teachers / lecturers / equivalent educators, and laboratory assistants). 14% of graduates work in the appropriate field of entrepreneurial work, and 5% work in other fields. The developed curriculum must be filtered through evaluation techniques. A good curriculum is an important role for child development, systems, and for national development [10]. The excess of curriculum setting by government / institutions led to changes in education support policy measures from technical reasons with a major focus on funding and resources to pedagogical reasons with a major focus on student competencies [11]. The leadership's response to the curriculum results stated that the curriculum achievement was good, it could be seen from the outcomes obtained, for example the achievement of student publications, the percentage of outstanding students, the number of student participation in national and international scientific forums, the distribution of work fields that graduates were involved in, and others. All of these achievements indicate the achievement of the study program's vision and mission. Previous reports that the curriculum in the Biology Study Program has been effectively implemented [12]. The follow-up that will be done is to raise curriculum standards at the international level.

4. CONCLUSION

The results of research on the evaluation of the Biology Education study program curriculum based on the CIPP model show effective results in terms of context, input, process, and product. Planning until the curriculum product has been carried out produces graduates according to the study program profile. The target of increasing international standards is an achievement in the future.

REFERENCES

[1] Sekretariat Kabinet Republik Indonesia, Peraturan Presiden Republik Indonesia Nomor 8 Tahun 2012 tentang Kerangka Kualifikasi Nasional Indonesia. Lembaran Negara Republik Indonesia tahun 2012 Nomor 24, 2012.

[2] Y.B. Bhakti, “Evaluasi Program Model CIPP pada Proses Pembelajaran IPA,” *JIPFRI: Jurnal Inovasi Pendidikan Fisika dan Riset Ilmiah* Vol. 1 no. 2, pp. 75-82.

[3] I. Mahmudi, “CIPP: Suatu Model Evaluasi Program Pendidikan,” *Jurnal At-Ta’dib* vol. 6 no. 1, pp. 111-125, 2011.

[4] A. Bashri, R.P. Puspitawati, M. Ibrahim, “Curriculum Implementation in Biology Program of Universitas Negeri Surabaya,” *Atlantis Highlights in Engineering (AHE)*, vol. 1. International Conference on Science and Technology (ICST 2018), 2018.

[5] A. Hasan, S.N.T.M. Yasin, M.F.M. Yunus, “A Conceptual Framework for Mechatronics Curriculum Using Stufflebeam CIPP Evaluation Model,” *Procedia – Social and Behavioral Sciences* vol. 195, pp. 844-849, 2015, doi: 10.1016/j.sbspro.2015.06.324.

[6] Y. Steinert, S. Cruess, L. Cruess, L. Snell, "Faculty development for teaching and evaluating professionalism: from programme design to curriculum change", *Medical Education* vol. 39, no. 2, 2005, https://doi.org/10.1111/j.1365-2929.2004.02069.x.

[7] D. Kavgaoglu, B. Alci B, "Application of context input process and product model in curriculum evaluation: Case study of a call centre", *Educ. Res. Rev*. vol. 11 no. 17, pp. 1659-1669, 10 September, 2016. DOI: 10.5897/ERR2016.2911.

[8] U. Akpur, B. Alci, H. Karatas, "Evaluation of the curriculum of English preparatory classes at Yildiz Technical University using CIPP model", *Edu. Res. Rev*. vol. 11 no. 7, pp. 466-473, 10 April, 2016. DOI: 10.5897/ERR2016.2638.

[9] S. Aziz, M. Mahmood, Z. Rehman, "Implementation of CIPP Model for Quality Evaluation at School Level: A Case Study", *Journal of Education and Educational Development* vol. 5 no. 1, pp. 189-206, 2018, DOI: http://dx.doi.org/10.22555/joeed.v5i1.1553.g389.

[10] A.J. Bharvad, "Curriculum Evaluation", *International Research Journal* vol. 1, no. 12, pp. 72-74, 2010.

[11] R. Vanderlinde , E.J. van Braak, R. Hermans, "Educational technology on a turning point: curriculum implementation in Flanders and challenges for schools", *Education Tech Research Dev* vol. 57, pp. 573-584, 2009, DOI: 10.1007/s11423-009-9126-9.

[12] A. Bashri, R.P. Puspitawati, M. Ibrahim, "Efektivitas Pelaksanaan Kurikulum di Program Studi Pendidikan Biologi Universitas Negeri Surabaya", *Jurnal Penelitian Pendidikan Matematika dan Sains* vo. 2, no. 1, pp. 1-5, 2018.