

Analysis of Competency Curriculum Alignment in Web-Based Application Development on the Study Program of PTIK UNS with the Industrial World

Wachid Adi Nugroho¹, Dwi Maryono², Puspanda Hatta³

^{1,2,3} Department of Informatics Education, Sebelas Maret University

Article Info

Article history:

Received Sept 14, 2023

Accepted March 25, 2023

Corresponding Author:

Wachid Adi Nugroho,
Departement of Informatics
Education,
Sebelas Maret University,
Jl Ahmad Yani, no 200,
Pabelan, Kartasura, Surakarta,
Jawa Tengah, 57169, Indonesia.
Email:
wachidadinugroho@student.uns
.ac.id

ABSTRACT

This study aims to: determine the application of the competency field curriculum in web-based application development on the UNS PTIK study program, select the needs for web-based application development competencies in the industrial world, and determine the alignment between the application of the web-based application development competency curriculum on the UNS PTIK study program and the need for competence in the field of web-based application development on the industrial world. The form of this research is qualitative research with six research subjects, three lecturers, and three alums. Data collection techniques used are document analysis, interviews, and questionnaires. The validity test technique used is source triangulation. The analysis technique used is a comparative descriptive technique. The results of this study indicate that the alignment of the curriculum in the competency field in web-based application development on the PTIK UNS study program with the industrial world as a whole is appropriate. Still, there needs to be development in several courses and collaborations involving industry directly in future curriculum preparation. Several stages in developing web-based applications in practice in lectures have not been carried out.

Keywords: alignment, analysis, application, campus, competence, industry, web

1. INTRODUCTION

The Informatics and Computer Engineering Education Study Program has three majors: Computer Network Engineering (TKJ), Software Engineering (RPL), and Multimedia.

Higher Education has designed a curriculum to implement lectures so students can achieve the expected competencies when they graduate later. In the Informatics and Computer Engineering Education Study Program, there are majors and several courses related to web-based application development competencies, namely Software Engineering, which includes several special courses that support the development of web development competencies, including Web Programming, Web Design, and Practicum Web Programming.

Seeing the background above, it is known that the role of higher education institutions is to prepare students who will graduate and be able to meet industry needs, especially the ability to develop web-based applications, whose demands are increasing day by day and continue to grow. So it is necessary to know how the suitability of the Web Development course curriculum at the UNS (Sebelas Maret University) PTIK (Informatics and Computer Engineering Education) Study Program in lectures is compared to Web Development in the Industrial World.

This study takes the title "Analysis of Compatibility of Curriculum in the Field of Web-Based Application Development Competency in the UNS PTIK Study Program with the Industrial World."

Based on the article of (Ramdani, 2021) that many fresh graduates have difficulty getting a job; in this case, because the researcher is studying in a study program related to informatics and computer engineering, the researcher's anxiety is more directed to that field. Seeing the large number of alums who have entered the industrial world in application development, most of them develop web-based applications compared to others.

Given these problems, the research method that researchers will use is to use qualitative methods, which will focus on the curriculum for web-based application development courses in the PTIK UNS study program with what is needed by the industrial world in developing web-based applications whether it is still not appropriate or has.

2. RESEARCH METHOD

This research took place on the Department of Technical and Vocational Education (JPTK) campus at Sebelas Maret University (UNS) and in Surakarta. This research was conducted from March to June 2021.

This study uses a descriptive qualitative approach. Data and data sources in this study (a). Primary data through questionnaires and interviews with (1). Lecturer in courses related to Web Programming in the PTIK UNS study program, (2). Graduates of PTIK UNS who have worked in web-based application development. (b). Secondary data was obtained through study documents from the PTIK UNS RPS study program.

This study used a purposive sampling technique. This study uses data collection techniques (1). Document Studies, (2). Questionnaire (Sugiyono, 2015), and (3). Interview (Usman, H., & Akbar, 2011). In this study, the data validity test technique used is qualitative validity with indications of qualitative reliability (Gibbs, 2007) (Creswell, n.d.). This study uses interactive data analysis techniques (Bungin, 2003). This study uses qualitative procedures; according to Sugiyono, (Sugiyono, 2015) there are several main stages, namely (1). Description, (2). Reduction, and (3). Selection. Furthermore, according to Sudjana (Sudjana, 2000) from these main stages, it can be described (1). Identifying Problems, (2). Problem limitation, (3). Determination of research focus, (4). Data collection, (5). Processing and interpretation of data, (6). The emergence of the theory, and (7). Reporting of research results.

3. RESULT AND ANALYSIS

The document the researchers examined in this study was the Semester Learning Plan (RPS) for the PTIK FIKP UNS study program, which the researchers obtained from the Sebelas Maret Open Courseware (OCW UNS) website. From the documents, the researcher retrieved some vital information, including Course Identity: Course Name, Course Weight (SKS), Semester, Prerequisite Courses, and RPS Developer Lecturers, from Graduate Learning Achievements (CPL): Course Learning Achievements (CPMK), Scientific Study Materials, Course Descriptions, and List of References, and from the table it is known how the Learning Stages, Learning Materials, Learning Methods, Learning Time, Learning Experience, Indicators, and Assessment Techniques.

The subjects of this study were three lecturers in the Informatics and Computer Engineering (PTIK) UNS study program related to Web-based application development competencies as stakeholders from the campus and three graduate students from PTIK UNS who have worked in the field of application development in particular, Web-based as stakeholders from the industry. Observations were conducted using interviews with all informants and collecting data through a special questionnaire for informants from the industry.

Interviews were conducted with campuses and industry to find out the profiles of the speakers, how the curriculum is related to Web-based application development competencies in lectures and collaboration with the industrial world from the campus/industry point of view, and hopes and plans for the future.

Questionnaire data collection from the industry was carried out to determine how the compatibility of the components in the RPS (Semester Learning Plan) in the course was with what was in the industrial world. In the first stage, the researcher gave the resource persons several RPS files from courses related to Web-based application development competencies, namely: (a). Structured Programming Language, (b). Database, (c). Algorithms and Data Structures, (d). Object Oriented Programming, (e). Software Engineering, (f). Web Design, (g). Web Programming, and (h). Framework-Based Web Programming. Then ask the resource person to read and study it carefully. Then finally, the resource person assesses the RPS through a questionnaire the researcher has provided. Then the assessment was carried out using a Likert scale with the following scale: (1) = Disagree, (2) = Less Agree, (3) = Undecided, (4) = Agree, and (5) = Strongly Agree. With a description of the final assessment, the total value of all components in each RPS is as follows: (1 – 9) = Not suitable, (10 – 18) = Not suitable, (19 – 27) = Conformity is doubtful, (28 – 36) = Appropriate, and (37 – 45) = Very suitable.

From the data analysis that has been carried out, it was found that the suitability of the curriculum in the competence field of web-based application development in the PTIK UNS study program with the industrial world as a whole is appropriate. Still, there needs to be development in several subjects and collaboration by involving industry directly in curriculum preparation in the future. There are still several stages in developing web-based applications in practice in lectures that have not been carried out.

Based on the results of the research above, it can be concluded that lecturers who are campus stakeholders, especially in the preparation of lesson plans used in lectures:

1. Have work experience of 2 years and a maximum of 9 years as a lecturer in a study program at PTIK UNS,
2. Have experience working in the industry directly before being a lecturer in the study program at PTIK UNS,
3. So that they have strong ability and credibility related to the field with this research.
4. Teaching at least four courses this last semester and related to this research.
5. Still preparing RPS independently with the provision of their previous work experience without directly involving outside industry parties.
6. The rapid development of web-based application technology in the industrial world has created obstacles to separate lectures because the RPS cannot change at any time, thus demanding that lecturers and students must be able to include the new technology reference material in their learning material even though it is not in the RPS.
7. With the current situation, which is still a COVID-19 pandemic, it requires distance learning to be carried out using the existing internet network, so students cannot use adequate computer laboratory facilities and must use their laptops/computers with not a few of them only having specifications and internet network are minimal so that it can hinder learning.
8. Keep Trying to Collaborate and discuss with the industry on an ongoing basis to find out what competencies are needed from the industrial world and suitable methods and strategies for preparing them so that the campus can develop a better RPS from year to year.

Based on the results of the research above, it can be concluded that workers/alums are industry stakeholders:

1. Have an average of 3 years of work experience, from working as a freelancer, in a software house, to a company.
2. What do they do, starting from an individual website, a small business website, to a website for large businesses across countries.
3. Their clients range from lecturers, printing businesses, educational institutions, Islamic boarding schools, and state-owned companies to companies from abroad.
4. So that it has strong ability and credibility related to the field with this research.
5. Overall, the RPS that already exists and is used in PTIK UNS is sufficient to provide graduates with the skills to enter the industry.
6. It would be better if there were advanced courses for databases because there are several new technologies and knowledge already widely used in industry but not yet available in lectures.

4. CONCLUSION

Based on the results of research on "Analysis of Competency Curriculum Alignment in Web-Based Application Development on the Study Program of PTIK UNS with the Industrial World," which has been conducted, the following conclusions are obtained:

1. So far, lecturers have prepared RPS themselves without direct cooperation with the industry and have made adjustments to the industry based on personal experience and field observations.
2. So far, the curriculum in lectures has provided introductory provisions for graduates to enter the industrial world.
3. There is still a lack of cooperation with industry, requiring students to find their own internships.
4. Several courses must be developed into new ones to provide advanced learning.
The needs for developing web-based applications in the industrial world are as follows:
 1. A solid will to continue to strive in the field that is focused on, measure the abilities possessed while continuing to learn and practice them, and be tough to continue learning and practicing them.
 2. Increasing knowledge from outside by trying to carry out independent exploration that can add to the knowledge and skills that have been taught on campus, as well as catching up quickly with changes in technology used in the world of work.
 3. Continue striving to improve the ability to think logically, which is fundamental.
 4. Have sufficient work experience, then prepare a portfolio to plunge into a more professional world of work in the future.
 5. Practice live coding skills and answer interview questions to prepare for tests that will likely occur when someone tries to apply for a programming-related job.
 6. In developing software engineering applications, one must know and be trained in each stage, starting

from Planning, Design, Development, Implementation, and Testing.

The suitability between the application of the web-based application development competency curriculum in the PTIK UNS study program with the needs of the web-based application development competency field in the industrial world as follows:

1. In lectures, several courses are already helpful for developing logical thinking skills in the early semesters.
2. Students begin to gain work experience through industrial practice programs or internships during their lectures, which can give students a candid picture of the industrial world.
3. In lectures, students are given assignments in the form of PBL (Project Based Learning), which starts from the Planning, Design, and Development stages. Still, the Deployment and Testing stages have not received much attention.
4. The preparation of RPS (Semester Learning Plan), which is now used in lectures as a whole, is needed in the industrial world, especially related to competency in web-based application development.

5. SUGGESTION

1. The campus can develop courses, especially databases, because what is currently available in lectures is still too basic compared to what is implemented in the industrial world. Let's say there is an Advanced course for this Database to fill this space.
2. Lecturers can complete the PBL (Project Based Learning) stages by including the Deployment and Testing stages.
3. Lecturers can increase student learning motivation by giving assignments and examples related to students and providing an overview of what needs to be prepared to enter the industrial world later.
4. Lecturers can ensure that students understand the introductory courses, which are very fundamental, so that in the future advanced techniques will not make it difficult for both the lecturers and the students themselves and will not hinder learning.
5. The campus can establish and cooperate with the industrial world out there so that, in the future, all parties will receive more benefits.
6. The campus can educate students as if students are talented after graduation; they can immediately work by providing training on answering interview tests and live coding skills.
7. The industry, especially alums, can provide ideas/suggestions on preparing to enter the industrial world to the campus so that good cooperation can be established, which will benefit all in the future.

REFERENCES

- Bungin, B. (2003). *Analisis Data Penelitian Kualitatif*. PT. Raja Grafindo Persada.
- Creswell, J. W. (n.d.). *Research Design Pendekatan Kualitatif, Kuantitatif, dan Mixed*. Yogyakarta: Pustaka Pelajar.
- Gibbs, G. (2007). *Analyzing qualitative data, The Sage Qualitative Research Kit*. London: Sage.
- Ramdani, F. (2021). *Lelah Mengejar Ijazah, Setelah Lulus Fresh Graduate Susah Cari Kerja*. Kompasiana.Com. <https://www.kompasiana.com/fajar31044/60692fc1d541df1eb7260492/lelah-mengejar-ijazah-setelah-lulus-fresgraduate-susah-cari-kerja>
- Sudjana, N. (2000). *Dasar-Dasar Proses Belajar Mengajar*. PT. Sinar Baru Algensindo.
- Sugiyono. (2015). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Alfabeta.
- Usman, H., & Akbar, P. S. (2011). *Metodologi Penelitian Sosial*. Jakarta: Bumi Aksara.
- Adani, M. R. (2018). *Jenis Aplikasi Berbasis Web Beserta Contoh Penerapannya*. <https://www.sekawanmedia.co.id/aplikasi-berbasis-web/>
- Arifin, S. (2018). *Desain Kurikulum Pendidikan Tinggi Sesuai dengan KKNI & SN-Dikti Dengan Pendekatan OBE di Era Industri 4.0*. <http://lppmp.uns.ac.id/wp-content/uploads/2018/12/DESAIN-KPT-Master27-11-2018.pdf>
- Fitri. (2013). *Kurikulum Nasional Berbasis Kompetensi Mengacu pada KKNI*. <https://lldikti12.ristekdikti.go.id/2013/04/28/kurikulum-nasional-berbasis-kompetensi-mengacu-pada-kkni.html>
- Parkay, F. W., & Hass, G. (2000). *Curriculum planning: A contemporary approach*.
- Hisam. (2021). *Pengertian Kurikulum Menurut Para Ahli*. <https://www.dosenpendidikan.co.id/pengertian-kurikulum-menurut-para-ahli/>

- Industri, P. (2020). *Pengertian Dasar Dunia Industri*. <https://www.mediadata.co.id/p/pengertian-dasar-dunia-industri.html>
- Kemendikbud, P. W. (2020). *Lima Syarat “Link and Match” Pendidikan Vokasi dan Dunia Industri*. <https://www.kemdikbud.go.id/main/blog/2020/09/lima-syarat-link-and-match-pendidikan-vokasi-dan-dunia-industri>
- Nasution. (2003). *Metode Penelitian Naturalistik Kualitatif*. Penerbit Tarsito Bandung.
- Nugrahadi, E. W., Maipita, I., Ane, L., & Putra, P. D. (2018). *ANALISIS IMPLEMENTASI KURIKULUM BERBASIS KKN DI FAKULTAS EKONOMI UNIMED. NIAGAWAN*. <https://doi.org/10.24114/niaga.v7i1.9349>
- Oliva, P. F., Taylor, R., & Gordon, W. (n.d.). *Developing the curriculum*. Scott, Foresman/Little, Brown College Division.
- RI, D., & RI, P. (2003). *Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*. https://pusdiklat.perpusnas.go.id/public/media/regulasi/2019/11/12/2019_11_12-03_49_06_9ab7e1fa524ba603bc2cdebe7b7ff93c3.pdf
- Wedan. (2018). *Evaluasi Kurikulum Beserta Implementasinya*. <https://silabus.org/evaluasi-kurikulum-beserta-implementasinya/>
- Yunia, D. (2020). *Program Studi Sekolah Vokasi UNS*. <https://vokasi.uns.ac.id/index.php/program-studi-sekolah-vokasi-uns/>