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Using ADDIE Instructional Model to Design Blended Project-Based Learning based on Production Approach

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Abstract

The main problem faced by students in software analysis and design is the material content that is full of software engineering theories, it is difficult to get the real world of software development steps. Lecturers need to make an effort to incorporate the element of "Best Practice" in software engineering into this lecture. This research develops a Blended Learning learning environment, with Project-Based Learning based on a Production approach as an answer to student learning problems. To design this model, tools with a systematic approach are needed to achieve this goal, as a guide that can be used to meet the needs of the learner. This paper shows how the ADDIE Instructional Model is used in designing a Blended Project-Based Learning (BPBL) learning environment with a production approach.

Keywords—*Software Analysis and Design, Blended Learning, Project-Based Learning, Production Approach, ADDIE (key words)*

I. INTRODUCTION

Software Engineering (SE) is one of main competence concentration in the Informatics Vocational Education Study Program is followed by students interested in the field of software engineering. As a core competency, SE aims to increase students skill in developing various applications and software systems. One of main course in this field is Software Analysis and Design (SAD). The restructuring of SAD subjects was targeted in this study in order to provide the competencies needed, through the development of Blended Project-Based-Learning (BPBL) based-on Production.

BPBL combines an online learning model with face-to-face in the classroom, which is supported by Project-Based Learning (PjBL) which provides student experience in software development and Production-Based (PrBL) as a tool used to measure output products from PjBL.

II. BACKGROUND

Indonesia was placed by GEDI (The Global Entrepreneurship and Development Institute) in 94th position out of 137 countries and 7th position out of 7 ASEAN countries on the Global Entrepreneurship Index (GEI) list [1:37]. GEI is an index used to measure the entrepreneurship ecosystem in a country.

From the GEI index variables, the majority of problems faced are the aspects of the pillars of startup skills, human capital (which are determined by the quality of education), the pillars of technology absorption and innovation process (which are determined by variables of technology level, technology uptake, average quality scientific institutions and the availability of scientists and technocrats).

The four issues above are being faced by all universities in Indonesia that have not been able to build a graduate startup culture, technological limitations and human resources, so that graduates add to the number of Open Unemployment Rate (OUR), which in February 2019 reached 6.89% (diploma)

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and 6.24% (universities), with a total of 7, 01 million people [2]. Therefore there must be an immediate effort from universities to be able to produce graduates who have good competence and skills, supported by good technological abilities and have a spirit of innovation, which leads to the ability of graduates to be entrepreneurial, through internalizing entrepreneurial attitudes in each Subjects are the main competence of students.

SAD course is a main competence courses in the Informatics Vocational Education Study Program [3], and so far RPL lectures are passed by students as theoretical subjects and without practical activities. Whereas software engineering competence is a core competency [4] so that graduates are able to develop applications and systems, as the basis for developing a startup in the field of technology and information systems.

Efforts to restructure SAD Subject need to be carried out in order to provide the skills needed by students, through the development of Blended Project-Based Learning (BPBL) based-on Production in the form of Software / Systems needed by the community [5]. Specifically BPBL integrated online learning technology with classroom teaching and learning, for flexibility delivery model on higher eduation [6], improve student learning outcomes [7], well accepted on student perspective [8] and facilitate teacher educators' authentic engagement with information technology [9]. BPBL model provides students with RPL concepts and theories in online learning sessions [10], which are followed by a project framework that will be completed during lectures, so that in face-to-face sessions, classroom activities can be maximized to facilitate students in constructing knowledge [11] and planning a real-project into a software product or system that has economic value, and is expected to reduce the gap between the industrial world and academia [12], which is in accordance with actual work standards and procedures [13].

This BPBL based on Production model, provides opportunities for students to think creatively, innovatively and collaborate in team work to produce software / system products that are economically and market-oriented [14], through the steps of project-based learning (PjBL) [15]. The development of this model uses the ADDIE Instructional approach [16]. The urgency of this research is the gap between the needs of the world of work and business with college graduates [17].

III. Overview of the ADDIE Model

The instructional design (ID) described as a systematic process or well-structured procedure [18], to make instructional become effective for Higher Education Classroom [19]. This Model developed to help educator ensure that they are teaching the appropriate material in an optimal manner [20], or to ". . . provide both an appropriate destination, and the right road to get you there . . ." [21]. ADDIE ID Model is a shorthand nickname from normal process of ID model [22], applied on development many educational subjects, like information literacy [23], library instruction [24], online continuing education [25] and MOOC [26]. This common core procedure of analysis, design, development, implementation, and evaluation defined as ADDIE model phases [27], this model redefined and revision [12] as shown as Figure 1.

Figure 1. Revision of ADDIE ID Model

IV. SAD Course Case studies of BPBL Based on Production

Various SE learning research has been carried out, such as through best practice approaches [28], creative approaches [29], model-driven [30], empirical approaches [31], and active and inductive learning approaches [32], by providing experience direct software development in a work-based environment on software development projects. All this research aims to have students have real

competence and experience in the world of work [33] the software industry, as a foundation to become entrepreneurs in the software world.

SAD course become a case studied on this development of BPBL based on Production model, to achieve our goal to give a best practice of student experience on production of economically software during they take this course. It is necessary to restructure the SAD curriculum in order to student to held knowledge and competencies in the SE field, and compete in the software industry both as a workforce and as a pioneer in a business startup on the SE field.

This paper describes the ADDIE phases sequentially, are continually made and revised during the process development of BPBL Model.

A. Analysis Phase

In this analysis phase a study on the technological readiness of students using a digital skills framework [34] related to students' readiness for technology, the readiness of students on a blended learning environment, project-based learning framework analysis, a production-based learning approach and curricula analysis.

Based on the framework, obtained data on aspects of motivation, material access, access skills and the use of digital technology by students. In the aspect of motivation, students have high motivation in utilizing digital technology as learning support. For material aspects, access is generally still dominated by campus network access and smartphone data. Whereas in the aspect of access skills, high skill data is obtained in the communication, information and operational elements, while in the strategic, content creation, and formal elements are at the level of standard skills and aspects of digital skills usage, the skills are balanced in the needs of daily life and activities as students.

For the learning environment blended learning, from the results of the analysis, a conceptual framework is produced, as shown in Figure 2.

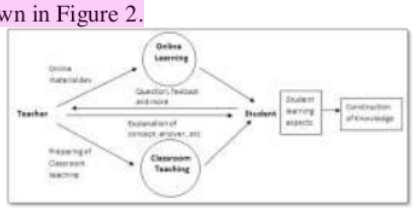

Figure 2. Blended Learning Conceptual Framework

In this conceptual framework, it can be seen how the process of developing Blended Learning learning, which consists of 2 learning environments, namely online learning and classroom teaching.

Project-Based Learning (PjBL) is a framework used for structured project management, allows students to learn authentically through project work, and lecturers become mentors who provide learning resources, support and guidance to students with the skills needed to complete their projects [35 : 35-36]. It is possible for students to conduct an in-depth investigation of the PjBL topic, which encourages of hight-order thinking [36]. PjBL is developed in 6 syntax steps [37], namely: a) start with essential questions, b) Design a plan for the project, c) create a schedule, d) monitor the student and progress of the project, e) assess the outcome, and f) evaluate the experience, illustrated in Figure 3.

Figure 3. Project-Based Learning Conceptual Framework

Production Based Learning (PBP) designed and implemented based on market needs and demands that refer to actual work procedures and standards, in the business world / industry and society. This model emphasizes work planning, procedures and final products that have a sale value and conform to

specified construction standard specifications [38], other definitions state "production-based learning model is defined as the procedures or steps that need to be performed by the educator to facilitate learners to actively learn, participate and interact, with competency-orientation to produce a product either goods or services required" [39] The realization of production-based learning is manifested in a syntax consisting of 9 steps, namely: 1) Curriculum analysis and student characteristics, 2) Product identification and analysis, 3) Making important questions about the product, 4) Mapping questions; 5) Analysis of the need for tools and materials of the product to be made; 6) Making the Schedule of the execution of the manufacture of the product, 7) The process of making the product, 8) Periodic evaluation, and 9) Making the Business Plan [13], as shown at Figure 4.

Figure 4. Production-based Learning Framework

The Production-Based Model in BPBL is expected to contribute in managing and guaranteeing software project products developed by students in SAD courses, which will have high economic value, and have good bargaining in the Business Plans.

The analysis of curriculum and software engineering material based on standards issued by IEEE in the field of Software Engineering called SWEBOK (Software Engineering Body of Knowledge) [38]. SWEBOK v.3 organizes the SE curriculum comprehensively into 15 subjects, aimed at the education of professionals in this SE field. Based on SWEBOK v.3, the scope and depth of the material are adjusted to the needs of the Informatics Vocational Education Study Program, seen at Figure 5.

Figure 5. Mind Map of SAD

B. Design Phase

After the analysis phase activity continued by the design phase, where create an overall blueprint of how the BPBL instruction will be delivered. In this phase, the design of the BPBL Model is built by integrating the required model elements, a complete framework is obtained from this model.

The Process Model in this BPBL based on Production is the integration of PjBL into a production-based approach, each stage of the process in each model experiences synchronization, and ends in the same process.

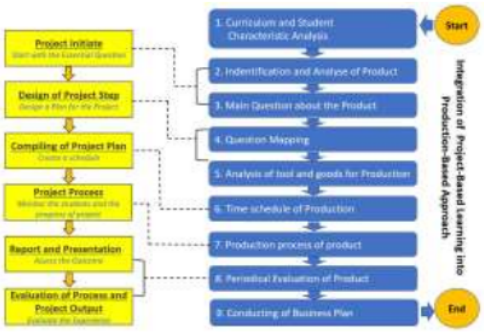

Figure 6. Model Process on BPBL

The complete design of the BPBL based on Production model can be seen in the following illustration Figure 7.

Figure 7. Complete Model of BPBL based on Production

C. Development Phase

In this development phase, several development processes are used to realize the design of the model, including the development of SAD content, materials and media, the development of a Moodle-based LMS.

The process of developing SAD Course content, materials and media uses the concept of learning design [39]. as shown in Figure 8, designed for online course, accessed by student using a LMS, consists of activities, such as writing course outlines and syllabus, course materials (PDF format), media (video lecture, presentation), student activity and tasks, and anticipating students' needs, as shown in Figure 9.

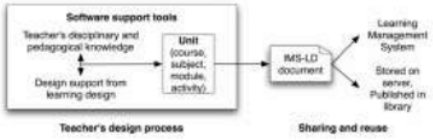

Figure 8. Learning Design based on LMS

Next step is development of a Moodle-based LMS as an online learning system [40], with features that meet pedagogical standards [41], and supported by functional plugins [42] to support student learning activities [43] on blended learning [44] in higher education [45].

Figure 9. Materian and Content Development Process

Development of Moodle-Based LMS based on this Context Diagram, and development result show as Figure 10 and Figure 11.

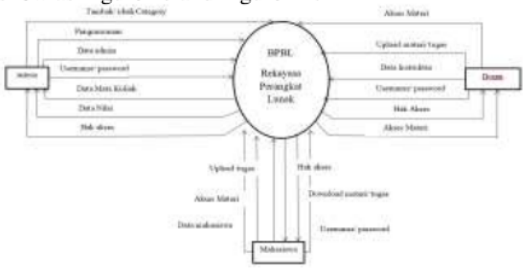

Figure 10. SAD Diagram Context Moodle-Based LMS

Figure 11. SAD Online Learning Moodle-Based LMS

D. Implementation

A limited implementation trial was conducted on 20 students who participated and explored BPBL based on Production with limited testing techniques, using pretest and posttest design, with result as follows :

TABLE I. TRIAL IMPLEMENTATION DATA

No	Student	SCORE		GAIN
		PRE	POST	
1	1	56	76	20
2	2	48	68	20
3	3	52	72	20
4	4	68	84	16
5	5	64	80	16
6	6	60	76	16
7	7	68	84	16
8	8	76	88	12
9	9	64	80	16
10	10	68	84	16
11	11	64	76	12
12	12	72	84	12

13	13	60	72	12
14	14	56	76	20
15	15	56	80	24
16	16	60	84	24
17	17	72	84	12
18	18	68	88	20
19	19	76	84	8
20	20	72	88	16
	N	1280	1608	328
	Average	64	80.4	16.4

Implementation of BPBL on real class activity on one semester course designed with schedule as follow :

No	Week	Project-Based Learning	Production-Based Control
1	I	Pengantar Perkuliahan dengan Model BPBL	
2	II	• Project Initiate (Group of Project)	• Indentification and Analyse of Product • Main Question about the Product
3	III	• Design of Project Step	• Question Mapping • Analysis of tool and goods for Production
4	IV	• Compiling of Project Plan	• Time schedule of Production
5	V - VIII	• Project Process	• Production process of product
6	IX	Project Progress Report	
7	X - XII	• Project Process (cont.)	• Production process of product (cont.)
8	XIII	• Report and Presentation I	• Periodical Evaluation of Product I
9	XIV	• Report and Presentation II	• Periodical Evaluation of Product II
10	XV-XVI	• Evaluation of Process and Project Output	Conducting Business Plan

Figure 12. BPBL Project Schedule

E. Evaluation Phase

Evaluation phase is used to evaluate the effectiveness of the instruction on BPBL Model. Tool to evaluate use a questionnaire distributed to students on limited testing, with results :

TABLE II. STUDENT RESPONS ON BPBL MODEL

No	Statement	Mean	Std. Deviation
1	I like learning with the Blended Learning Model	3.95	0.605
2	Blended Learning gave me the opportunity to study the course material early	4.20	0.523
3	Blended Learning helps me to self learning	4.10	0.553
4	With Blended Learning, I can apply learning strategies according to my academic abilities	4.10	0.641
5	Blended learning makes my time taken up more than usual	3.65	0.813
6	I was able to see the community problems through Project assignments in the PjBL	4.30	0.470
7	PjBL gave me experience in how a good team works	4.40	0.503
8	I am solving for solutions to the technical problems of community with the Software Project	4.30	0.470
9	I understand the importance of planning in completing a project	4.30	0.470
10	I understand the importance of good work scheduling in PjBL	4.05	0.510
11	I was helped by the monitoring of the Lecturer in developing my project	4.35	0.489
12	I was under pressure while completing the project	3.75	0.910

13	I am very satisfied with the resulting of project product	4.35	0.489
14	The Production Model gives me experience in identifying and analyzing project products	4.35	0.489
15	I was able to do a mapping of the problems I faced in producing project products	3.95	0.605
16	I did an analysis of the development tools that will be used in the project	4.20	0.410
17	Project schedule arrangements have tailored to the capabilities of our work team	4.15	0.489
18	PrBL gives me the ability to control developed project products	4.15	0.366
19	Periodic evaluations by the Lecturer help me manage project product completion	4.00	0.459
20	Periodic product evaluations by the Lecturer put me under pressure	3.70	0.470
21	I understand the steps and procedures in preparing a business plan	3.50	0.761
22	I have the ability to implement SE theory into projects developed through BPBL	4.15	0.489
23	With BPBL I understand how to manage the resulting software product	3.90	0.718
24	Learning with the BPBL model gives me experience in producing products that have economic value	4.20	0.410
25	BPBL provides experience for me to develop a good Business Plan	4.15	0.489

F. Future Direction

After the process of developing the BPBL Model in this SAD course, with limited implementation trials, the next step to be taken is to improve and revise the content and materials that are in accordance with the limited test results. Then test the effectiveness and practicality of learning in one semester, to find out how far the effectiveness and practicality of the BPBL model in this course as shown at Figure 12.

The future direction agenda of this research is planned as shown in Figure 13.

Figure 13. Future direction of research

V. Discussion and Conclusion

The results of this study show how the ADDIE Instructional Model can be systematically used in developing a Production-based BPBL Model, with directed and clear development steps.

From the results of the development of the BPBL model, in Table 1 it can be seen, an increase in student learning outcomes by looking at the comparison of pre-test and post-test results, with an average gain score of 16.4. Besides that, on the aspect of student acceptance of this BPBL model, from Table 2, students gave positive responses to each item of statement given. This shows the students' acceptance of this model is very good, as expected from this development research.

With the implementation of PjBL in PrBL in this BPBL model, it gives students experience to manage and collaborate in completing their projects, which then develops business plans for the results of software projects that have been developed.
And from the results of research and development of the BPBL Model, can be concluded as follows:

- The Software Engineering Learning System with the BPBL Model gives students the freedom and time to access and learn the material, anytime and anywhere through LMS UNP
- BPBL provides direct experience for students in managing a software development project, so that they understand the functions and their respective roles in a Team Work
- BPBL RPL provides opportunities for students to develop software that has high economic value through the preparation of a business plan from the software developed.

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REFERENCES

1. Zoltán J. Ács, et.al, "Global Entrepreneurship Index 2018", Washington DC, USA : The Global Entrepreneurship and Development Institute (GEDI), accessed from https://thegedi.org/wp-content/uploads/dlm_uploads/2017/11/GEI-2018-1.pdf, on 23rd March, 2019
2. BPS. "Berita Resmi Statistik: Keadaan Ketenagakerjaan Februari 2019". No. 41/05/Th. XXII, 06 Mei 2019, Jakarta : Badan Pusat Statistik (BPS), 2019
3. UNP. "Buku Panduan Akademik Universitas Negeri Padang Tahun 2018", Padang : UNP Press, 2018.
4. Jen-Chia Chang, Yuan-Du Hsiao, Su-Chang Chen, Tsung-Ta Yu. "Core entrepreneurial competencies of students in departments of electrical engineering and computer sciences (EECS) in universities", Journal of Education + Training, Emerald Sight, doi 10.1108/ET-10-2016-0160, 2017.
5. Shu Liu, et.al. "Social Demand-Oriented Education Model for Software Engineering", on Motta, Gianmario and Bing Wu (Eds), *Software Engineering Education for a Global e-Service Economy,* Switzerland : Springer Internasional Publishing, 2014.
6. [6] George-Walkera, Linda De and Keeffeb, Mary. : "Self-determined blended learning: a case study of blended learning design", Higher Education Research & Development, Vol. 29, No. 1, February, pp. 1–13, 2010
7. [7] Francisa, Rebecca and Shannonb, Susan J. "Engaging with blended learning to improve students' learning outcomes", European Journal of Engineering Education, Vol. 38, No. 4, 359–369, 2013.
8. [8] Wahaa, Barbara & Davisa, Kate. "University students' perspective on blended learning", Journal of Higher Education Policy and Management, 36:2, 172-182, DOI: 10.1080/1360080X.2014.884677, 2014
9. [9] Cutri, Ramona Maile and Whiting, Erin Feinauer. "Opening Spaces for Teacher Educator Knowledge in a Faculty Development Program on Blended Learning Course Development", Studying Teacher Education, doi.10.1080/17425964.2018.1447920, Informa UK Limited, 2018
10. Muhammad Adri, Ganefri, Jalius Jama. *Using Software Engineering Approach on Development of Blended Learning Environment*, on International Conference of Engineering and Environment (1st ICEE 2018), 08 November 2018, Engineering Faculty of Universitas Negeri Padang, 2018.
11. Muhammad Adri, Ganefri, Jalius Jama. *Using Moodle as Learning Management System on Blended Learning Envrionment Development*, on International Conference on Education, Science and Technology, 13-15 Maret, 2019, at KONASPI IX Meeting, Universitas Negeri Padang, 2019
12. Rusu, Adrian; Rusu, Amalia; Elliott, Robert. "Work in Progress : Smoothing the Border between Academic and Profesional Software Engineering Environment through Entrepreneurship", IEEE

Proceedings. Frontiers in Education. 36th Annual Conference - San Diego, CA, USA, doi 10.1109_fie.2006.322569, 2006.

13. Ganefri. "The Development of Production-Based Learning Approach to Entrepreneurial Spirit for Engineering Students". Journal Asian Social. Science; Vol. 9, No. 12; 2013.
14. Quezada-Sarmiento, Pablo Alejandro; Enciso, Liliana; Mayorga-Dia. "Promoting Innovation and Entrepreneurship Skill in Professional in Software Engineering Training", 2018 IEEE Global Engineering Education Conference (EDUCON), Santa Cruz de Tenerife, Spain, doi 10.1109_EDUCON.2018.8363312, 2018.
15. Leat, David. "Inquiry and Project-Based Learning", London : Routlegde, 2017.
16. Branch, Robert M.. "Instructional Design: The ADDIE Approach". New York: Springer Science Business Media, LLC, 2009.
17. Ana M. Moreno; Maria-Isabel Sanchez-Segura; Fuensanta Medina-Dom. "Balancing software engineering education and industrial needs", Journal of Systems and Software Volume 85 issue 7 year 2012, doi 10.1016_j.jss.2012.01.060, 2012.
18. Silber, Kenneth H. "A Principle-Based Model of Instructional Design", Handbook of Improving Performance in the Workplace, Volume One, Edited by K. H. Silber, W. R. Foshay, R. Watkins, D. Leigh, J. L. Moseley and J. C. Dessinger, p. 23, doi. 10.1002/9780470592663.ch2, 2010.
19. Mingjian, Fang et.al. "On the ADDIE-based Effective Instructional Designfor Higher Education Classrooms", Advanced Materials Research Vols 271-273 (2011) pp 1542-1547, Switzerland : Trans Tech Publications, 2011.
20. Cheung, Lawrence, "Using the ADDIE Model of Instructional Design to Teach Chest Radiograph Interpretation", Journal of Biomedical Education, Volume 2016, Article ID 9502572, 6 pages, http://dx.doi.org/10.1155/2016/9502572, 2016.
21. G. M. Piskurich, "What is this instructional design stuff anyway?" in *Rapid Instructional Design: Learning ID Fast and Right*, G. M. Piskurich, Ed., chapter 1, John Wiley & Sons, Hoboken, NJ, USA, 3rd edition, 2015
22. Molenda, M. "In search of the elusive ADDIE model", Performance Improvement, 42 (4), 34–36, 2003.
23. Davis, Angiah L. "Using instructional design principles to develop effective information literacy instruction: The ADDIE model", College & Research Libraries News, volume 74, issue 4, pp.205-207, 2013.
24. S. Reinbold, "Using the ADDIE model in designing library instruction," Medical Reference Services Quarterly, vol. 32, no. 3, pp. 244–256, 2013.
25. T.-C. Hsu, J. Lee-Hsieh, M. A. Turton, and S.-F. Cheng, "Using the ADDIE model to develop online continuing education courses on caring for nurses in Taiwan," ournal of Continuing Education in Nursing, vol. 45, no. 3, pp. 124–131, 2014.
26. Nordin, Norazah. , Embi, Mohamed Amin., and Norman, Helmi. "Towards Envisioning the Future of Learning in Malaysia: Development of a Malaysia MOOC Based on the Iterative ADDIE Instructional Design Framework", on J.E. Luaran et al. (eds.), Envisioning the Future of Online Learning, doi.10.1007/978-981-10-0954-9_24, Singapore :Springer Science+Business Media, 2016.
27. Molenda, M. " Origins and Evolution of Instructional Systems Design", Handbook of Improving Performance in the Workplace, Volume One, Edited by K. H. Silber, W. R. Foshay, R. Watkins, D. Leigh, J. L. Moseley and J. C. Dessinger, p. 77, doi. 10.1002/9780470592663.ch3, 2010.
28. Miller, Jan & Mingins, Christine. "Putting the Practice into Software Engineering Education", IEEE Comp. Soc, International Conference of Software Engineering, 26th -29th January 1998, New Zealand, 1998
29. Zagar, Mario et.al. "Enhancing Software Engineering Education – a Creative Approach", ACM SEESE 08, 13th May, 2008, Leipzig, Germany.

30. Hamou-Lhajd et.al. “The Impact of Model-Drivem Approach to Software Engineering on Software Engineering Education”, IEEE 2009 Sixth International Conference on Information Technology- New Generations - Las Vegas, NV, 2009.
31. Neyem, Andres, et.al. “Improving Software Engineering Education through an Emperical Approach: Lessons Learned from Capstone Teaching Experince”, 45th ACM Technical Symposium, 05-08 March, 2014, Atlanta, Georgia, USA
32. Sedelmaier, Yvonne & Landes, Dieter. “Active and Inductive Learning in Software Engineering Education”, IEEE_ACM 37th IEEE International Conference on Software Engineering (ICSE), 16th – 24th May, 2015, Florence, Italy
33. Daimi, Kevin and Rayess, Nassif. “The Role of Entrepreneurship in Computer Science Curriculum, Proceedings of the 2008 International Conference on Frontiers in Education: Computer Science & Computer Engineering, FECS 2008, July 14-17, 2008, Las Vegas, Nevada, USA
34. van Dijk, Jan A. G. M. and van Deursen, Alexander J. A. M. "Digital Skills: Unlocking the Information Society", New Yokr : Palgrave MacMillan, 2014.
35. Tan, Jospeh and Chapman, Anne. "Project-based Learning for Academically-Able Student", Rotterdam, The Netherland : Sense Publisher, 2016
36. Leat, David. "Inquiry and Project-Based Learning", London : Routlegde, 2017.
37. Lucas, George. " Instructional Module Project-based Learning", accessed at http://www.edutopia.org/modules/pbl/whatpbl.php, on 20th Mei 2019.
38. IEEE Computer Society. " Software Engineering Body of Knowledge (SWEBOK) version 3rd" accessed at https://www.computer.org/education/bodies-of-knowledge/software-engineering/v3, at 10th March 2019.
39. Koper, Rob and Bennett, Sue. "Learning Design: Concepts", Handbook on Information Technologies for Education and Training, accessed at https://www.researchgate.net/publication/226972357.
40. Kuran, Mehmet Sukru, and Pedersen, Jens Myrup. "Moodle: Practical advices for university teachers", Advances in Intelligent Systems and Computing Conference, DOI.0.1007/978-3-319-68720-9_21, published at https://www.researchgate.net/publication/320085620, 2018
41. Lima, Manoel M. A., Brito, George L. R. and Caldeira, Elaine B. "Preference of the use of Moodle as a Learning Management Systems in Brazilian Universities”, International Journal of Learning and Teaching, Vol. 5 No. 4, 2019.
42. Zdravev, Zoran, et.al. "Analytics and Report Plugins in Moodle", Proceeding of 8th International Scientific Conference Computer Science' 2018, Kavala, Greece, 2018
43. Willans, Fiona, et.al. "Fostering and evaluating learner engagement with academic literacy support: Making the most of Moodle", Journal of University Teaching & Learning Practice, Vol. 16, Issue 4, 2019.
44. Bentabol, Amparo, Soler, Mariano and Esteban, Ana. "Experience Of The Use Of Moodle For Flipped Classroom In Higher Education", Conference Paper, published at https://www.researchgate.net/publication/337276243, 2019.
45. Ghosh, Anusua, et.al. "Learning management systems with emphasis on the Moodle at UniSA", Bulletin of Social Informatics Theory and Application, Vol. 3, No. 1, March 2019, pp. 13-21.

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