Development of 21st century skill learning designs through the application of the concept of independent learning in the vocational field

I G Sudirtha¹, N K Widiartini² and M D Anggendar³

¹Dept. of Family Welfare Education, Faculty of Engineering and Vocational, Universitas Pendidikan Ganesha, Bali, Indonesia

Corresponding author: gede.sudirtha@undiksha.ac.id

Abstract. This research aimed to develop 21st Century skill learning tools through the application of the concept of independent learning curriculum for independent vocational campus, as the implementation of the policy for independent learning towards an independent campus by the Ministry of Education and Culture in 2020. This research was conducted using the research and development method with steps of defining, designing, developing, and disseminating. To determine the feasibility of the learning device’s result, a validation was carried out using the Gregory formula by using two fields’ experts, namely learning technology experts and vocational education experts. Furthermore, improvements were made from the results in the form of suggestions and input from experts. The results showed that the learning device for the independent learning curriculum concept course was declared valid and applicable. Therefore, it was very feasible to be used to support the implementation of courses that supported the independent learning policy for independent campus.

1. Preliminary

Facing the 21st century, all countries race to build and develop their human resources so that they can work and compete in the arena of global competition. For this reason, the competencies in accordance with the demands of skills in this century must be mastered. Sudira in 2018 [1] formulated eleven key skills that determine a person's work competency capability in the 21st century, including: (1) the ability to solve problems creatively using critical thinking; (2) the ability to build relationships with others; (3) the ability to work together; (4) the ability to use language, symbols and text interactively and effectively in communicating both orally and in writing; (5) the ability to access and analyze information into new knowledge; (6) the ability to use internet-based communication and information technology; (7) the ability to innovate; (8) the ability to lead, assess and make decisions; (9) the ability to negotiate; (10) the ability to perform services to satisfy customers; and (11) the ability to develop sustainable self. Hence, it is necessary to properly prepare learning activities that lead to the formation of 21st century competencies and skills mastery through the development of learning designs which also refer to the independent campus program, independent learning, according to Permendikbud Number 3 of 2020 [2]. Common problems in vocational learning (especially the Clothing Industry Subject) show student’s learning experience is not supported by adequate experience and adequate resources in learning activities to develop their abilities and competencies according to the demands of the course. Learning activities do not take place naturally and are less contextual. Subject educators are not competent enough to bring
students to the learning experiences of how a fashion industry takes place in producing clothes based on market demand. It is caused by learning activities that only take place on campus. It is also caused by the little direct touch and experience about the fashion industry.

The concept of independent learning by the Ministry of Education and Culture of the Republic of Indonesia through Permendikbud Number 3 of 2020 [2] concerning National Higher Education Standards Article 18 explains that the fulfillment of the period and study load for students of undergraduate or applied undergraduate programs can be carried out through: 1) following the entire learning process in the study program in Higher Education according to the period and study load; and 2) following the learning process in the study program to fulfill part of the study period and load and the rest following the learning process outside the study program. The policy of independent learning aims at encouraging students to master various useful disciplines to enter the work field. The Merdeka Campus provides an opportunity for students to determine the courses they will take.

Based on the concept explained above, it is necessary to implement independent learning model guided by lecturers and students in carrying out independent lectures and in accordance with the expected competency achievements. In this case, it is related to the learning content, technical learning and expected competency achievements in courses that apply the independent campus learning model. It is necessary to conduct a study to produce an agreement between the study program and the industrial world. Therefore, a learning design needs to be developed through development research involving several industries and study program parties to study and arrange various, good and mutually beneficial student learning activities. Through this research, it is hoped that student learning activities can take place in accordance with the demands of the desired skills in the 21st century.

The policy direction of the Ministry of Education and Culture in 2018 implies the strengthening process of character education and high-order thinking skills learning activity. High-order thinking skills learning activity is a learning activity that involves three aspects of winged skills, namely transfer of knowledge, critical and creative thinking, and problem solving. For this reason, in the context of 21st century learning recommended by the Ministry of Education and Culture through learning activities, what needs to be done are: (1) provide a brief explanation; (2) make it a habit to provide answers to students’ questions with questions that encourage students to think; (3) each learning unit begins with a problem and ends with a problem solving formula; (4) brings students to the realities that exist in society; (5) encourages students to reveal the mastered to solve the problems that they face; (6) provides opportunities for students to find problems independently; (7) provides opportunities for students to formulate problems; (8) encourages students to see problems from various aspects; (9) provides opportunities for students to analyze information and data that they own; (10) encourages students to find information and data relevant to the problems at hand; (11) encourages students to develop various alternative solutions to the problems faced; (12) encourages students to evaluate various alternatives and determine the best alternative; (13) provides opportunities for students to formulate solutions; (14) encourages students to compile a mind mapping (systematics of knowledge in their brains in pictures, diagrams, symbols, equations) of subjects they have learned [3].

Educators have to develop effective communication skills, so that students can carry out their role in high-order thinking skills learning activity. Furthermore, these guidelines expect teachers or educators to have roles such as [3]: (1) Preparing for Learning: it is related to build a plan for each student to actively participate in learning; compile a scenario for implementing inquiry by preparing topics will be studied; prepare material needed in investigations and discussions; prepare questions to deepen the discussion and develop critical thinking; look for and prepare materials to stimulate students at the beginning of learning; have skills, knowledge, and habitual behavior as well as thinking patterns needed in HOTS learning; master the techniques and plan the ways to encourage students to participate and have responsibility in learning; ensure learning is focused on the goals; prepare anticipation of expected and unexpected questions and suggestions; prepare the classroom environment with the equipment, materials, and resources needed in the learning process. (2) Facilitating Learning Activities: the activity is related to several things such as preparing a daily, weekly, and monthly learning framework as well as annual notes; formulating the emphasis of competencies developed as well as models and
development of behaviors and students’ thinking patterns; creating a free, comfortable, and pleasant classroom atmosphere for thinking activities; providing guidelines according to the material or subject to be studied; understanding that teaching is an integral part of the learning process; asking questions to encourage thinking from inferential questions, interpretive questions, transfer questions, and hypothetical questions, to bring students actively to the learning process; appreciating and encouraging students’ responses; if incorrect or misconceptions responses are found, the teacher should bring students to explore the right response effectively; eliminating learning barriers and, if necessary, providing instructions to students; assessing students’ development and providing facilities in learning; controlling the class directly or indirectly also monitoring the students’ activities.

Article 14 (1) Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 3 of 2020 concerning National Higher Education Standards [2], states that the learning process through curricular activities must be carried out systematically and structurally through various courses and with a measurable learning load. (2) The learning process through curricular activities is required to use effective learning methods in accordance with the characteristics of the course to achieve certain abilities specified in the courses in a series of fulfilling graduate learning outcomes. (3) The learning method as referred to in paragraph (2) can be selected for the implementation of learning in courses including: group discussions, simulations, case studies, collaborative learning, cooperative learning, project-based learning, problem-based learning, or other learning methods, which can effectively facilitate the fulfillment of graduate learning outcomes. (4) Each course may use one or a combination of several learning methods as referred to in paragraph (3) and be accommodated in a form of learning. (5) The form of learning as referred to in paragraph (4) can be in the form of: a) college; b) responsiveness and tutorials; c) seminar; d) practicum, studio practice, workshop practice, field practice, work practice, e) research, design, or development; f) military training; g) student exchange; h) internship; i) entrepreneurship; and/ or j) another form of community service.

Furthermore, Article 15 (1) states that the form of learning as referred to in Article 14 paragraph (5) can be carried out within the Study Program and outside the Study Program. (2) The form of Learning outside the Study Program as referred to in paragraph (1) is a learning process consisting of: a. Learning in other study programs at the same university; b. Learning in the same Study Program at different universities; c. Learning in the other study programs at different universities; and d. Learning in non-tertiary institutions. (3) The Learning Process outside the Study Program as referred to in paragraph (2) letter b, letter c, and letter d is implemented based on a cooperation agreement between two Higher Education Institutionor other related institutions and the results of lectures are recognized through the Credit Unit transfer mechanism Semester. (4) The learning process outside the Study Program as referred to in paragraph (2) is an activity within the program which can be determined by the Ministry and/ or Higher Education Leaders. (5) The Learning Process outside the Study Program as referred to in paragraph (2) is carried out under the guidance of the lecturer. (6) The learning process outside the Study Program as referred to in paragraph (2) letter c and letter d is implemented only for undergraduate programs and applied undergraduate programs outside the health sector.

Guided by the concepts and regulations above, this study tries to find a learning concept in a vocational field course (Industrial Clothing Course) in the Family Welfare Education Study Program, Faculty of Engineering and Vocational Undiksha through a development research. In this concept, there are several important things that will be guided as key concepts, namely: (1) learning activity takes place with the aim that the mastery of student competencies can be obtained maximally which refers to mastery of attitudes, knowledge, and skills according to the demands of the course; (2) learning activity is done based on market demand so that it refers to the demands of 21st century competencies; (3) the pattern of learning activities is not limited to one learning source, but from various relevant sources; (4) learning activities are not limited to one place (classrooms, studios, workshops), but in several places that are relevant and enable students to learn effectively and meaningfully; (5) learning activity is not time-bound. Based on the 5 concepts above, a clear and precise planning is needed, so that learning objectives can be achieved as expected, especially the fulfillment of the demands for skills mastery. The plans are also need to be in accordance with 21st century skill needs and the mastery of higher order thinking.
skills (HOTS) skills within the framework. the concept of independent learning: towards an independent campus.

Referring to article 12 of Permendikbud Number 3 of 2020 Article (13) of the Semester Learning Plan (RPS) or other terms at least contains [2]: a. name of the Study Program, name and code of courses, semester, Semester Credit Unit, name of lecturers; b. graduate learning outcomes imposed on courses; c. final abilities planned at each learning stage to meet the learning outcomes of graduates; d. study material related to the ability to be achieved; e. learning methods; f. the time provided to achieve the ability at each learning stage; g. student learning experience which is embodied in a description of the assignments that must be done by students for one semester; h. assessment criteria, indicators, and weight; and i. the list of references used. Hence, this research will develop and reorient a new design of learning activity for the Industrial Clothing Course by using, improving and reviewing the syllabus of the Industrial Clothing Course that previously applied in the Family Welfare Education Study Program as follows.

This research does not use several sources as study material only, but also involves stakeholders who will help in contributing and studying how learning takes place, so that it is following the applicable concepts and regulations. Hence, the subject requirements are met in an appropriate curriculum. Research conducted by Rafianti, Anriani, and Iskandar in 2018 [4] stated that to achieve learning objectives in the 21st century, educators must design learning activity that supports 21st century skills. One of the characteristics of learning required in developing this aspect is learning that can present problems as a way to get concepts, which is implied in the matter. The results of this study indicated a success in developing learning designs using the 4-D method. The same thing was also reviewed in the research of Sugiyarti, Arif, and Mursalin in 2018 [5], that the implementation of 4C in the 2013 curriculum learning will have a tremendous impact on the nation's future generations to face the challenges of the 21st century. Moreover, implementing 21st century skills into learning activity is truly expected to be able to produce students who can compete in their era.

2. Research Methods

This research was a development research with the concept of developing learning design which starts from a concept of how learning leads to the concept 21st century skills mastery by bringing freedom for students to add and develop their competence through their ability to gain access to independent learning. This research approach was development research (research and development) to produce learning designs that lead to the formation of student competencies in the 21st century, with a 4-D development model, with the following steps [6,7]: define, design, develop, and disseminate. The design of the learning design development procedure with the concept of independent learning uses Thiagarajan's modification and development model known as the 4-D model. This development model uses 4 stages consisting of define, design, development, and dissemination. The following is a representation of the development used.
Figure 1. Research procedures adopted from the 4-D Model

The data collection instrument in this study was in the form of a validation guide (questionnaire) for the independent learning tools for independent campus learning. This guidance contains guided things to validate the feasibility of learning designs. Data analysis was carried out based on the Gregory formula to test the content and construct validity. The content validity coefficient can be done qualitatively and quantitatively by 2 experts [8,9,10,11,12].

\[ V_c = \frac{D}{A+B+C+D} \]

Notes:
- \( V_c \): Construct Validity
- A: Both judges Disagree
- B: Judges 1 Agree, judges II Disagree
- C: Judges 1 Disagree, judges II Agree
- D: Both judges Agree

Notes:
- 0.80 – 1.00: Very High Validity
- 0.60 – 0.79: High Validity
- 0.40 – 0.59: Midle Validity
- 0.20 – 0.39: Lower Validity
- 0.00 – 0.19: Very Lower Validity

(Gregory, 2000)
3. Results and Discussion

This study developed a course design based on the concept of an independent learning curriculum to realize 21st century skills. The results of this study were in the form of a learning design that has been developed using the Thiagarajan model [6], with the following steps: define, design, develop, and disseminate. These four steps were modified and developed as needed in several stages to produce learning design products until the product trial stage and the product is ready to be implemented.

3.1 Define

At this stage, there were several aspects that become the focus of the study to make a clear picture related to the competency standards of graduate courses, namely in the form of studies on learning materials and competency outcomes, such as material characteristics and competency demands of graduates/learning outcomes after taking an independent study program outside the study program (in industry/groups of small entrepreneurs in the fashion industry); techniques for implementing students learning, implementation time, activities that can be accumulated and recognized as semester credit units that are equivalent to the demands of the course.

From the analysis carried out based on the limitations of the independent learning curriculum, eight forms of independent learning activities are found. The results of the discussion in the FGD obtained input so that independent learning can form a strong character in students and lecturers in seeing the development of science and technology. 4C skills as outlined in the concept of 21st century learning and the 4.0 industrial revolution.

This character concept is expected to be used as a guideline for lecturers, students, and partners as a place where independent learning is carried out (industry) as a guide in carrying out independent learning activities by students in thinking and acting, analyzing developments, the phenomenon of changing times, in the context of development of science and technology, which refers to the needs of life provisions for the future, and also as a guide for lecturers to guide students in implementing the policy of independent learning for independent campus. By integrating 21st century skills into the independent campus learning curriculum, 4C skills are made into a compulsory component that is developed in curriculum materials that are integrated with industry activities when students practice independent guided learning. The 4C skills are described and translated into learning and working activities in the industry as follows:

1. Communication. Students are required to carry out activities that lead to understanding good communication methods, managing situations that are able to create effective communication in the context of activities in working orally or in writing, directly or through online media. The material for planned learning activities is to create an atmosphere so that students are given the opportunity to train and implement their ability to express ideas, discuss with colleagues, company leaders, and clients in the company/industry so that they are able to solve all problems in the world of work/industry. The expected learning outcomes are in the form of: the ability to communicate well in Indonesian and English in completing work.

2. Collaboration. Students are guided to be able to demonstrate their ability to work together in groups and to have a leadership attitude, and to be able to adapt to various situations responsibly, to always be productive in a group work atmosphere, to respect different views/principles. All of this is done in an environment of work in the industry as well as in the wider context of public relations.

3. Critical Thinking and Problem Solving. Students practice and implement reasoning skills and use higher-order thinking skills to provide opinions, problem-solving solutions in understanding and making complex choices, understanding the interconnection between systems.

4. Creativity and Innovation. Students practice and implement their critical thinking skills to develop, implement, and convey new ideas in the work process by promoting an open attitude and responsiveness to developments in the world of work.

3.2 Design

Based on the results of definitions of several concepts about the independent learning model course, learning outcomes, task analysis, industry characteristics, monitoring, and evaluating forms and models, in this study a draft learning device design referred to the resulting concepts. The design draft includes:
a learning model. Problem Based Learning and inquiry learning model with contextual approach. In this draft, the resulting syllabus, RPS, and learning media contain learning materials, learning scenarios, story boards, and designs layout as well as guidelines for implementing independent learning lectures (draft-1). Designing the concept of character and competencies that students would acquire in independent learning according to what has been previously defined. One of the planned concepts was aimed to build student’s innovation power through good processes that were obtained directly in the field. Together with supervisors, students must be able to collaborate to find problems, find innovative ideas to produce something that is truly useful for the interests of developing science and technology. In the context of learning, in this case, a formulation was also produced which became an important emphasis in building student’s character, namely carrying out a process activity in producing innovation is the most important thing, while the result was one thing that was not too important. However, if the process had been done well, the results would be good.

3.3 Develop
Higher education institutions are required to give students the right to be able to take two semesters (equivalent to 40 credits) outside of higher education, and to be able to take one semester (equivalent to 20 credits) in different study programs at the same university. The types of student activities that can be carried out outside the campus/ outside 2 tertiary institutions are internships/ work practices, village projects, teaching at schools, independent studies / projects, research, entrepreneurial activities, independent studies / projects, and humanitarian projects. The right to study for three semesters aims to improve the competence of graduates, so that they are more ready and relevant to the needs of the times, preparing graduates as future leaders who are superior and have personalities. Thus, students have the opportunity and can volunteer to take learning outside the study program at the same tertiary institution for 1 (one) semester or the equivalent of 20 credits; and a maximum of 2 (two) semesters or the equivalent of 40 credits of studying in the same study program at different tertiary institutions; learning at different study programs at different universities; and/ or learning outside of college.

In the concept of the independent campus learning curriculum, it does not only give students the right to take credits of 40 credit units as conceptualized in the concept of the independent campus learning curriculum in their study period which is taken in the 5th, 6th, and 7th semesters. It is more than just a free or independent concept. In a discussion held by the Ganesha Education university campus through the Deputy Chancellor for Academic Affairs, it was stated that the independent campus learning curriculum held at Undiksha chose a maintained independent learning atmosphere [13]. Based on this concept, in this study, the concept of independence was further developed which still directed students to achieve their competence freely in the corridor of scientific development and skills and attitudes that are competent, have competitiveness and remain in character. In the following, several formulations regarding the maintained independence indicators were developed which were integrated with the 21st century competency formulations of the 4.0 industrial revolution as abbreviated as 4C (Communication, Collaboration, Critical Thinking and Problem Solving, Creativity and Innovation).
**Table 1.** Character Development Matrix

| Character and Skills Development Matrix | HOTS |
|----------------------------------------|------|
| **4C skill**                            | **21st Century skills** | **The ability to analyze and develop new ideas, taking advantage of the atmosphere/ conditions in the field** |
| Communication                          | (1) the ability to build relationships with other people, (2) the ability to use language, symbols and text interactively and effectively in communicating both orally and in writing, (3) the ability to access and analyze information into new knowledge, (4) the ability to use Internet-based communication and information technology | Ability to communicate ideas with groups, utilizing groups analytical skills, problem solving, the ability to come up with new ideas |
| Collaboration                          | (5) the ability to cooperate, (6) the ability to perform services that are able to satisfy customers | critical and creative thinking skills, skills to create new creations in new products/ concepts |
| Critical Thinking and Problem Solving   | (7) the ability to solve problems creatively using critical thinking | |
| Creativity and Innovation              | (8) ability to innovate, (9) ability to lead, assess, and make decisions, (10) ability to develop sustainable self | |

Focus Group Discussion (FGD) and workshop Study Program curriculum development that includes planning, learning process, assessment, and learning evaluation including conversion mechanisms and procedures, as well as quality assurance based on Graduate Learning Outcomes;

3.4 Dessimination

In this stage, validation, evaluation, and dissemination process were carried out. Dissemination was carried out in September 2020 by inviting internal campus stakeholders such as university leaders, deans, study programs outside of their study programs, as well as external parties including vocational high schools, and related industries. Furthermore, the assessment and validation of learning tools in the form of syllabus and semester learning plans (RPS) were carried out by 2 (two) experts consisting of learning technology experts and vocational education experts. The results of the validation and expert suggestions were then used as material for reflection and improvement of the device. The product produced through this development research was in the form of learning tools consisting of syllabus and RPS courses that support the policy of independent learning at an independent campus which also included strengthening student character in supporting 21st century competencies / skills, HOTS learning, and 4c skills (communication, collaboration, critical thinking and problem solving, creativity and innovation). The results of validation and assessment by 2 (two) experts showed that the learning device (syllabus) obtained an average score of 4.0 (relevant) and through calculations with the Gregory formula, it obtained a very high validity (1.0). Thus, the developed syllabus could be said to be valid in terms of content and construction, so it was suitable for use.

Meanwhile, the results of the validation and assessment of the Semester Learning Plan by 2 (two) experts indicated that the RPS developed obtained an average score of 4.0 (relevant), while the calculations with the Gregory formula obtained very high validity (1.0). Thus, the RPS developed could be said to be valid in terms of content and construction, so it was suitable for use. Furthermore, from the input and suggestions of experts, improvements were made based on the deficiencies given by all validators. Following the target, this development research has produced a learning device design that
was ready to be implemented in realizing a study program that was ready to organize an independent campus learning curriculum (MBKM).

The basis for the development of independent learning tools for independent campus learning was developed based on several indicators such as 21st century skills, 4c skills (communication, collaboration, critical thinking and problem solving, creativity and innovation), and the ability of high order thinking skills in learning devices as guidelines for lecturers and students in carrying out and implementing lecture activities outside the study program and in the industrial world, as well as in the community. Learning tools could be used as guidelines for the implementation of lecture activities independently as well as directed and guided. Freedom in the sense that students freely find a place where learning activities were carried out with clear signs with indicators in accordance with the competencies (course learning outcomes) that have been formulated, with directed activities that follow the atmosphere/ conditions in the field. Thus, students were directed to find and carry out learning activities according to problems that occur in the field. This is the main characteristic of learning tools that use the concept of independent learning in an independent campus which is very different from the concept of conventional learning tools. In terms of evaluation, in this learning tool, evaluation/ assessment models and forms were also designed that lead to assessments that can obtain evidence of student learning outcomes that assess all student activities in the field. The assessment was carried out based on process as well as results. The form of assessment was used in various forms of assessment instruments such as portfolio assessment, project-based assessment, and performance assessment.

The development of learning tools was also developed in accordance with the development and learning methods of adults in which learning outside the campus was expected to be carried out collaboratively, cooperatively in developing abilities, intellectually, personally, and professionally. Fry et al. in 2013 [14], explained that the interpersonal and interactive nature of group learning makes it a challenging and appropriate vehicle for engaging students in their learning activity. Students involved in groups, both as learners and as collaborators in their intellectual, personal, and professional development. In addition to the understanding and knowledge they gain, they also showed that participation, ownership, and involvement were important dimensions of experience. The implication is that the process of building and managing groups, and fostering relationships, was very important. Groups could be seen as an important mechanism for exploring the development of a variety of key skills. Furthermore, it was stated in the group that self-confidence could be increased, cooperation and interpersonal communication developed, and it could foster conditions in which they could observe their learning styles, change styles according to different tasks, and be more involved with their learning material. This is also explained by Licona in 2013 [15], in the context of learning that took place collaboratively would be able to teach values such as cooperation, building community, basic life skills, increasing academic achievement, self-esteem, and attitudes towards institutions, as well as potentially reducing the negative aspects of competition.

4. Conclusion

Based on the results of the research and discussion above, several things could be concluded. Based on the analysis and discussion, it could be concluded that the learning device for the independent learning curriculum concept subject to realize 21st century skills developed based on the judgment of experts and industry practitioners was declared valid and applicable. Therefore, it was very feasible to be used to support the implementation of courses that support the policy of independent campus learning independent. 21st Century skill learning that was integrated with 4C skills (Communication, Collaboration, Critical Thinking and Problem Solving, Creativity and Innovation) and HOTS (higher order thinking skills) was very likely to be achieved by students through independent learning independent campuses in the vocational field. Through this developed learning device, the implementation of the independent campus learning curriculum which would be implemented outside the study program and outside the campus was in accordance with the Regulation of the Minister of Education and Culture Number 3 of 2020 Article paragraph 1, regarding the form of learning activities could be achieved properly.
References

[1] Sudira 2018 *Metodologi Pembelajaran Vokasional Abad XXI, Inovasi, Teori, dan Praksis* (Yogyakarta: UNY Press)

[2] Peraturan Menteri Pendidikan dan Kebudayaan Nomor 3 Tahun 2020 Tentang Standar Pendidikan Nasional.

[3] Director General of GTK 2019 *HOTS 2019 Learning Guidelines Book* (Jakarta: Ministry of Education and Culture of Republic of Indonesia)

[4] Rafianti I, Anriani N, and Iskandar K 2018 Pengembangan Perangkat Pembelajaran Matematika dalam Mendukung Kemampuan Abad 21 *KALAMATIKA Jurnal Pendidikan Matematika* 3 123-138

[5] Lina S, Alrahmat A, Mursalin 2018 Prosiding Seminar dan DiskusiNasional Pendidikan Dasar 2018 Tema: Menyongsong Transformasi Pendidikan Abad 21 ISSN: 2528-5564.

[6] Thiagarajan et al. 1974 *Instructional Development for Training Teachers of Exceptional Children* (Indiana: University Bloomington)

[7] Divayana D G H, Ariawan I P W, and Suyusa P W A 2020 Development of E-Learning Content Based on Kelase-Tat Twamasi in Supporting Learning During the Covid-19 Pandemic *The 4th International Conference on Vocational Education and Training*, 19 September 2020, Universitas Negeri Malang, Indonesia, pp. 41-46

[8] Gregory R J 2000 *Psychological Testing: History, Principles and Applications* (Boston: Allyn and Bacon)

[9] Sugiharni G A D, Setiastih N W, Mahendra I W E, Ardana I M and Divayana D G H 2018 Development of alkin model instruments as evaluation tools of blended learning implementation in discrete mathematics course on STIKOM Bali *J. Theor. Appl. Inf. Technol.* 96 5803-5818.

[10] Ariawan I P W, Simatupang W, Ishak A M, Agung A A G, Suratmin, Adiarta A and Divayana D G H 2018 Development of ANEKA evaluation model based on TOPSIS in searching the dominant aspects of computer learning quality determinants *J. Theor. Appl. Inf. Technol.* 96 6580-6596

[11] Divayana D G H, Adiarta A and Sudirtha I G 2019 Instruments Development of Tri Kaya Parisudha-Based Countenance Model in Evaluating the Blended Learning *International Journal of Engineering Pedagogy* 9 55-74.

[12] Divayana D G H, Sudirtha I G and Gading I K 2020 Application design of countenance evaluation based on Tri Hita Karana-Aneka for evaluating the students computer capability and students character *Cogent Psychology* 7 1-18.

[13] Dantes G R 2020 *Draft Panduan Merdeka Belajar Kampus Merdeka Undiksha, Makalah disampaikan dalam rangka sosialisasi implementasi MBKM Undiksha 2020* (Singaraja: Universitas Pendidikan Ganesha)

[14] Fry H, Ketteridge S, and Marshall S 2013 *Handbook Teaching and Learning: Strategi Peningkatan Mutu Pendidikan di Perguruan Tinggi*, terjemahan Ahmad Asnawi (Pekanbaru: Zanafa Publishing)

[15] Lickona T 2013 *Pendidikan Karakter: Panduan Lengkap Mendidik Siswa Menjadi Pintar dan Baik*, terjemahan Lita S (Bandung: Nusa Media)