Assessing by doing: A Balinese culture based assessment

N M S Mertasari¹, I M Yudana² and N Gita¹

¹Educational Research and Evaluation Post Graduate Faculty, Universitas Pendidikan Ganesha, Bali – Indonesia, 81116
²Educational Administration, Post Graduate Program Faculty, Universitas Pendidikan Ganesha, Bali – Indonesia, 81116

Abstract. An integrated assessment model for assessing cognitive, affective, and psychomotor simultaneously has been developed for formative assessment in computer class. The assessment model was adopted from a Balinese culture based assessment. Many of the skills in Bali are learned through a collaborative process between skilled workers and young workers who help them. Through observations and in-depth interviews with some community figures it was found that skilled workers taught skills to young workers while they are working together. If the process runs normally, then in the future, young workers will become skilled workers. During the collaboration process, skilled workers evaluate the learning progress of young workers. Evaluation is done through a process similar to analogy. The skilled worker gives an example of performance, then the young worker is asked to imitate the example. Young workers will attempt to implement such performance examples, while expert workers do assessments while working. Assessment is done in an integrated manner including cognitive, affective, and psychomotor components. The assessment model has been tried to be adopted for formative assessment in computer class and developed in the form of performance assessment. Students are given problems to be resolved and similar problems with it's solutions are attached. The student solve the problem by doing analogy with the problem that has been solved. The assessment rubric includes the cognitive, affective, and psychomotor components. Gradually the similarity of the problem is reduced, so that the students are finally able to solve new problems without any examples.

1. Introduction

The development of academic competence and character building are the two main goals of education in schools. These two goals are inseparable in preparing students for entering the workforce, for further education, for lifelong education, and for being good and responsible citizens. The development of academic competence contributes to the improvement of abilities and skills. Character building helps form attitudes and behaviors, such as honesty, integrity, respect, responsibility, self-discipline, self-management, and self efficacy. Character education creates an environment that is expected to improve the effectiveness of learning activities. The hope is that no student can finish school by mastering academic competence but lacking in character. Schools with good quality character education tend to produce graduates with higher academic ability [1].
Recently the school has been pursuing a good and true moral mission. Moral is an essential component in the effort to nurture and develop the ideas and efforts of educators. The moral mission intended here is not to point to religious beliefs, but morals that all peoples may understand as they have responsibilities for each other. Paradigms that are held on this moral mission are including: 1) education is a moral activity; 2) the student is a youth who can be forged very short and crucial; 3) what is learned and what is not learned is very important; 4) what is customary and what does not become a habit has consequences on the students; and 5) what one person believes to be good and right is in accordance with the general outlook of life [2].

Nowadays, children learn more about the habits and morals from their groups and mass media such as television, magazines, newspapers, or internet, so the attention for experience gained in schools is not as much as in a past decade. The teacher's role has been reduced only as a technician, using various strategies to help transfer information and skills to students. The meaning of the word teacher as someone who helps the child to shape himself better has been reduced to helping students to improve their competencies, skills, or techniques. On the other hand, students perceive that the services provided by teachers are their right, so do not view education as their responsibility. This attitude is clearly not beneficial for the maintenance of good and right relationships between teachers and students.

People feel that the decline in moral values and character is caused by several factors. These factors are including: 1) mass media such as television, film, magazines, or other mass media that present violence, drug use, sexual deviation, theft, and academic fraud; 2) lack of role models because many artists, politicians, or leaders are promoting lifestyles that conflict with moral and ethical principles; and 3) problems in the household. Many students expressed boredom in school, which may be caused by a medium of entertainment that is all beautiful and presented on a large scale or there is a problem at home.

Moral, ethics, politeness, rules, and rights or obligations must be striven for the school to maintain its function. The key to successful education in schools is the quality of interpersonal relationships involved in school. It is increasingly clear that ethics and morality are central issues in children's education. Communities, educators, and parents strongly insist that children learn well to be productive, kind, and useful to humanity. The child must be taught to think rationally and responsibly. In addition, children should be taught to enjoy learning, as long as they want to live in a democratic world, where everyone has the same rights, duties, freedoms, interests and responsibilities.

Character education is integrated within the school environment, whether in the curriculum, teaching strategies, or co-curricular programs. The difficulties experienced by teachers in implementing character education and field studies in an integrated manner occur in the assessment, especially formative assessment. Formative assessment is a process by which teachers apply various instruments and strategies to determine what competencies the students have achieved, identify gaps between the competencies of the students with the competencies of the standards to be achieved, and plan the next learning to improve student learning outcomes [3], [4] &[5]. Formative assessment is a window for teachers to observe student learning progress.

Formative assessment encompasses all the processes that teachers undertake during learning to get feedback about student learning progress [6]&[7]. Teachers are required to be able to apply formative assessment in an integrated manner between character education and field of study. For teachers, information gained from formative assessments is very useful for improving the learning process. In contrast to students, information from formative assessments is very useful as a self-evaluation tool to make changes in learning steps for learning objectives that have been outlined.

There are several elements that must be met in the implementation of the formative assessment to run more effectively, namely: 1) the teacher adjust the learning process with the response obtained from the assessment, 2) the students receive feedback related to the learning outcomes with suggestions on what should be done to improve the learning process, and 3) students participate in formative assessments through self-assessment [8]. The students’ responses to formative assessment
will be the teacher's guide to adjust the learning process. In the meantime, teacher feedback on student responses will serve as a guideline for students to adapt their next learning steps.

Formative assessment and feedback can be utilized by teachers to improve student self-regulation [4], [9]. Self-regulation can be manifested in the form of setting goals and learning objectives, organizing learning activities, choosing strategies for achieving learning objectives, monitoring learning activities, managing learning resources, regulating reactions to external stimuli, and some other self-activities. The student responds to the tasks assigned during the lesson. Feedback received from teachers is used to monitor the progress of learning. The results of these monitors are used as guidelines to improve the learning process to achieve predetermined learning objectives.

Formative form of assessment can be anything, which is logically important to be done by students and able to provide feedback to students as soon as possible [5]. Material outreach and time allocation are arranged in such a way that there is conformity between the characteristics of the students and the competency standards that the curriculum demands. The character education learning outcomes are more about affective (attitude) and psychomotor (behavioral) domains, such as honesty, responsibility, readiness to work hard, independence, and so on. Therefore, the selected assessment form should be able to measure the cognitive, affective and psychomotor domains well.

The test is an appropriate form of assessment for measuring cognitive domains. Meanwhile, the appropriate form of assessment to measure affective and psychomotor domains is questionnaire, inventory, portfolio, interview, or direct observation. Its difficult for the teachers to apply some form of assessment when conducting a formative assessment. The difficulties can occur either on the preparation of the instrument, the implementation of the assessment, or on the provision of feedback. Therefore a formative assessment is needed that can measure the academic ability and character education as well.

For the need above, a research was conducted to construct assessment that can simultaneously measure learning outcomes in terms of academic ability and character education adopted from Balinese culture based education, hereinafter referred to as integrated character education assessment. The research addressed to solve several problems, namely what are the indicators of integrated character education assessment, how the implementation of the assessment is, and how the validity of the assessment is.

Balinese culture-based education that is adopted is the process of education on the concept of mutual cooperation called ngayah. Ngayah means offer or provide social or religious services [10] or to help out with a religious or community activity [11]. The people involved in the mutual cooperative process are from children, adolescents and adults. Therefore, in the mutual cooperative process occurs the process of learning and assessment. While teaching, adults assess teenagers and children, and teenagers assess children. Assessment occurs integrally in knowledge, skills, attitudes, and behavior.

2. Methods
The research aims to construct an integrated formative assessment encompassing a field of study and character education. The data were collected through observations and completed with data obtained from in-depth interviews. The observations were done on places that were doing social activities or religious activities with mutual cooperative. In-depth interviews were conducted on respondents determined by snowball technique. The interview begins with the first selected respondent, then the next respondent is determined by the direction of the first respondent [13]. Interviews with respondents were discontinued when data were considered saturated. The data were analyzed by Miles & Huberman method, consists of data reduction, data display, and conclusion drawing or verification [14].

3. Results and Discussion
The literature review found that from the very beginning, the Balinese learned various skills informally through culture-based education. Carpentry, agriculture, animal husbandry, arts, including the skills of making religious ceremonies tools studied by Balinese through the learning process in
various social organizations and religious organizations. Mutual cooperative in Balinese daily life to share among others also includes the learning process. In various activities of social or religious organizations there is always a process of learning from seniors to juniors. Both seniors and juniors work in various organizational activities. Senior work while teaching junior, while junior work while learning from senior.

The learning process includes not only knowledge and skills, but also includes ethics, manners, appreciations, responsibilities, and other forms of character education. The seniors are teaching skills to the juniors. While communicating, seniors also insert moral messages, ethics, manners, responsibilities and so on. When juniors make mistakes, then the senior provides guidance or direction. Conversely, when juniors do the right thing or a good thing, then seniors will give moral awards. Seniors will use these achievements as an example for other juniors. It can accumulate a sense of brotherhood and build togetherness through the activities undertaken with mutual cooperation without any expectation of money or other materials in return [15].

The commonly applied learning model is giving examples. Senior gives examples of processes, products, attitudes or behaviors that are then imitated by juniors. Furthermore, seniors provide some sort of training to the juniors with analogy techniques. Senior gives examples and solutions similar to the given example. With various efforts the juniors will solve the problem. Problems or tasks can be individual or group tasks, depending on the type of problem. In the context of social work in Bali, the majority of work is done voluntarily. The seniors volunteer to educate the juniors, on the contrary the juniors are also volunteering and self-awareness learning from seniors.

While working and educating juniors, seniors also conduct assessments for juniors. Assessment is done through direct observation. Assessment includes skills, attitudes, and behaviors. Assessments use unwritten instruments, but are only remembered by seniors. If a junior shows inappropriate skills, then the senior will provide coaching with examples. When a junior makes a mistake in behaving, the senior will provide direction on the correct attitude or behavior. Such attitudes and behaviors include ethics, manners, appreciation, courtesy, and responsibility.

If the above assessment model is adopted in the school, such integrated assessment can be done not only for classroom activities, but also for out-of-class activities. Thus, other school staff may be included as evaluators, as long as their competence is appropriate to the activity. Thus, specifically for character education assessments, other than school staffs, families, churches, and other communities responsible for character education may be involved in the assessment of character education for an established common goal [16]. In this case, the assessment instrument must be well formulated, so that all evaluators can conduct the assessment appropriately.

The relevant instrument for formative assessment of integrated academic education and character education is inventory. Inventory is a collection of statements that state the characteristics of the student's skills, attitudes or behaviors [17]. The statements include a range of scores that the evaluator can select in terms of the student's skills, attitudes or behaviors. The better the students' performance, attitudes, or behaviors are shown, the higher the score will be. In the developed instrument, the range of scores provided 1 to 5, which 1 is at the ugly pole and 5 is at the well pole. The evaluator gives the scores according to the observations made.

Collection of formative assessment results can be used as portfolio because it contains some collection of works done by students. Portfolio as a personal collection that contains evidence of works (artifacts) as well as student reflections on achievement, development, strength, and the best work as a result of learning [18], [19]&[20]. A directed portfolio can improve students' ability to formulate learning needs, select meaningful learning activities, and complete learning tasks to lead to future learning [21]. Portfolio assessments are viewed as alternative assessments, authentic assessments, or performance assessments [20]&[22].

The developed assessment model has been tested in the formative assessment of computer programming. Students are given programming problems. If the problems presented are new, then the teacher includes an example of a solution that students can use to do the analogy. Students' work are then assessed using the inventory already developed. Inventory contains an assessment of process
components, products, and attitudes. Assessment results are then given feedback and returned to the student. Students are asked to collect their work in one folder to be viewed and reviewed again whenever needed. At the end of the semester the collection of the results of the assessment is submitted to the teacher as a portfolio. The activity is very similar to the CORP portfolio assessment model (collecting documents, organizing, reflecting, presenting) [18].

Interviews to students indicate that their learning process is greatly assisted by such formative assessment models. On the one hand they can be creative with their abilities, while elsewhere if they encounter problems they can be analogous to the prepared example. Furthermore, an integrated assessment of process components, products, and attitudes gives them a more complete picture of the learning outcomes. Feedback provided gives students guidance to improve themselves on weak components and improve themselves on the already good components. Collection of formative assessment results into the portfolio gives them the opportunity to improve self-management.

4. Conclusion
An integrated formative assessment instrument for academic ability and character education has been attempted to develop. Instruments contain assessment of cognitive, affective, and psychomotor aspects. Assessment is done by giving the problem to be resolved. Assessment is done from the beginning until the completion, including working process, resulting product, and attitude or behavior during working. Besides components of process and products, rubric of assessment including assessment of character education components, such as ethics, manners, appreciation, courtesy, responsibility, and cooperative attitude.

The assessment can be developed anyway for the other fields, such as engineering, building, or fine art. Assessment rubric can be extended including the selection of materials or tools (if needed), choice of methods (if necessary), efficiency (materials, time, or energy), communication methods, and so on. By using assessment rubric, the teacher or the other evaluator performs an integrated assessment from the beginning until the end of the student’s work.

The integrated assessment model developed not only can be used in the classroom, but also outside the classroom. The assessment model can be used to assess various activities outside the classroom, such as work services, prayers, wall magazine making, or art performances. Assessment should not only be done by teachers, but may involve other school staff, such as librarians, administrators, parents, and even the community [12]. Thus, schools can be realized as a place for value validation, a place of cooperation between school staff with student’s and with student’s parents, a place to find out if character education is successful or not. Attempts to maintain character education exist in schools.

The assessment model adopted from the Balinese culture-based learning model has been tested to inherit skills and character from one generation to the next generation. Now a junior with his own consciousness learns from his senior. Someday the junior will become a senior. At that time, they will teach and assess the new juniors. Thus the learning process takes place naturally on self-awareness. For the next time, skills, attitudes, and behaviors are taught to others voluntarily also. Thus a democratic agreement will be established between all parties to a peaceful life.

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