

The Measurement of Student Learning Outcomes in a Holistic Learning Environment

Abdul Murad bin Ahmad

East West International CollegA-3-1, Jalan Dataral Sentral 1 Dataran Sentral 70200 Seremban
Negeri Sembilan Malaysia.

1. Introduction

Within the field of education there have always been questions regarding the current state of the education system, seeking to identify the ways in which the education field and the course offerings to students could be improved (Bowe, Ball, & Gold, 2017; Eisner, 2017; Ellis, 2014). One of the more recent trends toward the improvement of the education offered to students is a shift toward the implementation of a holistic educational experience (Armstrong, Hustvedt, LeHew, Anderson, & Connell, 2016; Han, 2014; Lauricella & MacAskill, 2015). The holistic education movement is based around the idea that in order for a student to be well-rounded in his or her education, he or she must experience all aspects of that education equally, focusing on the total growth and development of the student (Armstrong et al., 2016; Han, 2014; Lauricella & MacAskill, 2015).

While such a practice has indeed garnered additional attention in the field of scholarly research in recent years, and while the goal of striving toward the best education possible is indeed a noble one, worthy of further attention and consideration, the question of how the application of such a theory of education affects the measurement of student learning outcomes is one that is little considered (Bhushan, 2015; Mahdavinia & Shoja, 2013; Suhid, Jusoh, Bakar, & Mamat, 2014). In order to explore this topic in greater detail, the purpose of this mixed methodology descriptive study was to explore the

measurement of student learning outcomes in an education environment, toward the nurturing of holistic, entrepreneurial, and balanced graduates. Through the combination of knowledge, practical skills, social skills and responsibility, ethics and values, communication, problem-solving skills, information management, and entrepreneurship, it became possible to identify some of the most effective measurements of student learning within the context of a specific entrepreneurial school implementing the holistic education experience.

2. Literature Review

Lakatos's philosophy of science is one of the common theoretical models used as a means of exploring the concepts of holistic and moral education (Han, 2014). This particular philosophy allows for the analysis of research programs in order to determine whether the shift in thinking about a particular problem, in this case, the improvement of educational offerings, is one that is progressive (Han, 2014). In other words, the application of this particular theory allows for the determination as to whether the change in practices serves to provide a benefit, does not result in improvement, or creates further functional difficulties in the application of the designed solution. Results have indicated that the shift toward the implementation of a holistic education program is a positive step forward in the educational field (Bhushan, 2015; Han, 2014; Mahdavinia & Shoja, 2013; Suhid et al., 2014). The implementation of a holistic educational

practice has been shown to increase the skillset held by the student following graduation, provided the student with skills that are beneficial to the student's chosen career field, and aided in improving the overall readiness level of the student following graduation, allowing him or her to be better prepared for life outside of the classroom (Armstrong et al., 2016; Bhushan, 2015; Han, 2014; Lauricella & MacAskill, 2015; Mahdavinia & Shoja, 2013; Suhid et al., 2014). It is as a result of these, and other, benefits that the implementation of holistic education practices have increased. In spite of these increases, little research has been conducted to determine how student learning outcomes are assessed within the context of the holistic learning environment, whether or not those assessment practices are sufficient, and indeed, whether there is a more efficient or more effective means through which to measure learning outcomes (Brown, Bull, & Pendlebury, 2013).

3. Methodology

In order to explore this topic in greater detail, a mixed method descriptive study was employed in the completion of this study, allowing for the collection and assessment of student work utilizing multiple assessment means and the collection of interview data from teachers to determine the perceptions of the most effective measurement tools for the assessment of student learning outcomes within the context of the entrepreneurial school setting. The use of a mixed method study selected as the ideal methodology as it would allow for a holistic exploration concerning the question of holistic education, ensuring that, as in the type of educational model employed, the study would look at both qualitative and quantitative means of exploration to ensure a full analysis of the subject matter (Creswell, 2013). A descriptive study method was identified as the most appropriate for implementation, allowing for data triangulation within the context of a specific setting or

environment utilizing the previous assessment data prior to the (Creswell, 2013). Quantitative data collected included the assessment of student learning objectives through the implementation of current methods used by the teachers in comparison to the new assessment methods provide to teachers. Qualitative data was collected in the form of semi-structured interviews conducted with teacher participants following the completion of the quantitative data collection process. Data was collected from thirty different full time teachers working in a specific entrepreneurial school. Teachers were provided with the three different student assessment measures and requested to implement those measures in the assessment of student completed projects in addition to their normal assessment measures in order to determine the effectiveness of the assessments themselves. Data was collected for a two week period of time in order to gather pertinent data without excessively over burdening teacher workloads. Identification of teacher perceptions toward the effectiveness of the assessment measures in comparison to the currently utilized measures allowed for the documentation of the three new assessment methods being explored. The iCGPA integrated assessment mechanism was the primary alternative assessment method provided to educators, while the secondary assessment method was self-monitoring and self-assessment, and the tertiary assessment method was formative assessment; these were employed in addition to the rubric based summative assessment traditionally employed (Abdullah, 2016; Litchfield & Dempsey, 2013).

Teachers were requested to document assessment results from each of the four different assessment methods used in order to determine which was the most effective quantitatively. As there could be a potential for ethical concern in the provision of grade book data, teachers were instead asked to simply provide a numerical value, 1-4, associated

with each assignment given to students for each assessment method. The 1-4 rating, with one being the highest or most appropriate for that assignment, and 4 being the lowest, allowed for the ranking of assessment mechanism effectiveness without compromising student data. It was this 1-4 ranking provided by each of the thirty teachers for each assignment given within a two week period of time, that the researcher collected as results. Teachers had an average of 12 assignments per class, with each teacher having an average of two classes, for the two week period during which data was collected.

Following the collection of this data, a series of 10 semi-structured interview questions were asked of participants to determine what their perceptions were regarding the most effective of the four different assessment methods implemented. Teachers had classes ranging from 15-20 students, making the task one that was highly intensive for the teachers. Each interview took approximately 30 minutes to complete. Interview data was recorded and transcribed within 48 hours of the completion of the interview by the researcher.

Prior to the start of the data collection process, all teachers were required to sign informed consent forms. The first form provided an overview of the overall study, and then explained the teacher's role in the collection of quantitative data. Once this form was signed, teachers were provided with the log to document the effectiveness of each of the different assessment methods, complete with an instruction sheet identifying the process of implementing those assessment methods, to ensure that all teachers were implementing the three new alternative assessment methods in the same way. Following the turn in of the quantitative data to the researcher, the researcher provided the participant with the second informed consent form. This form, like the first, provided a general overview of the study and then explained the interview process, the collection of qualitative data, and the participant's role in the same. All

participants were assured of confidentiality of data in both informed consent forms and all were aware of the processes that could be used to remove themselves from the study or to gain additional information on the study, or to have their questions answered by the researcher. None chose to drop out once signing either of the informed consent forms. Following the collection of the second signed informed consent form, the researcher discussed with the participant when the best time to setup the semi-structured interview would be. The interview was then scheduled. No participants rescheduled their interviews, and all were prepared at the time of the interview to complete the interview process in full.

The heavy workload that the data collection process placed on the teachers was one of the limitations of the study. While two weeks of data collection could be argued as an insufficient amount of time to effectively explore the different assessment methods in order to effectively determine their true effectiveness over time, due to the nature of the data collection process and the inability on the part of the researcher to analyze student assessment data due to school policy, this limitation was one that could not be mitigated within the context of the current study. Additional limitations included the need to utilize each of the different assessment methods concurrently due to the number of different assessment methods employed and the need to see the differences between them within the context of the same body of students. Future studies can work to address this limitation through the completion of an alternate application of assessment methods.

4. Results and Discussion

The results of the quantitative data were collected first and were analysed first, prior to the scheduling of interviews or the analysis of the same. The following table, Table 1, serves to indicate the different values each teacher gave for the first twelve assignments given during the two

week period for each of the four assessment tools implemented.

Table 1: Quantitative Assessment Results.

Teacher	Assessment 1 – summative	Assessment 2 – iCGPA	Assessment 3 – self- assessment	Assessment 4 – formative
Teacher 1	3	1	4	2
Teacher 2	1	2	3	4
Teacher 3	4	3	2	1
Teacher 4	2	4	1	3
Teacher 5	3	1	2	4
Teacher 6	4	2	3	1
Teacher 7	3	1	2	4
Teacher 8	4	1	3	2
Teacher 9	3	2	4	1
Teacher 10	2	1	4	3
Teacher 11	1	2	3	4
Teacher 12	4	3	2	1
Teacher 13	1	4	3	2
Teacher 14	1	3	4	2
Teacher 15	4	1	3	2
Teacher 16	4	2	3	1
Teacher 17	3	2	1	4
Teacher 18	4	1	2	3
Teacher 19	4	2	3	1
Teacher 20	3	2	4	1
Teacher 21	4	1	2	3
Teacher 22	1	2	3	4
Teacher 23	2	1	3	4
Teacher 24	1	2	3	4
Teacher 25	4	2	1	3
Teacher 26	4	2	3	1
Teacher 27	4	2	3	1
Teacher 28	4	1	3	2
Teacher 29	1	2	3	4
Teacher 30	4	3	2	1
	2.9	1.933	2.633	2.433

By averaging the responses of each of the thirty teachers on each of the twelve assignments and placing them into table format, and then by

averaging those answers, it became possible to identify the form of assessment that each teacher rated on a scale of 1-4 as being the best form of

assessment to use in the entrepreneurial school employing a holistic education approach. The results indicated that the use of the iCGPA assessment was preferred as the highest, while the use of the formative assessment was second choice, the use of self-assessment and evaluation was the third choice, and the use of the traditional summative assessment was the least effective of all of the assessment methods explored within the context of the study.

Following the identification of the most to least effective assessment methods, the scheduled interviews collected from the teachers. Of the ten questions asked, the first five questions were associated with basic demographic and classroom data. The first question asked all teachers to confirm that they were working in a holistic classroom environment. All indicated in the affirmative. The second question asked how long they had been teaching in the holistic classroom environment. Fifteen of the teachers indicated that they had been teaching in a holistic environment at that school for the past two years, the point and time at which the transition was made to the holistic school environment. The other fifteen teachers were hired following that time, with answers ranging from one year to one and a half years. All teachers had been working in the holistic classroom environment for at least one year and up to two years at the time of the study. Half of the participants were male and half of the participants were female. All indicated that they were familiar with the four types of assessments employed in the completion of the study and no participants indicated any difficulty with the implementation of each of the four types of assessment methods.

The next question asked of participants requested that they indicate their preferred assessment method. Several of the participants indicated that their preferred assessment method was not the assessment method that they would necessarily consider the most effective. As one participant

stated, "Just because I like the self-assessment and evaluation method does not mean that it is the most effective method for classroom implementation. While I feel as though this serves as the best means of engaging students in the learning process, this does not mean that it was the most effective as an assessment tool." Others provided similar responses, indicating that they preferred one method, but that preference was not an indicator of effectiveness. The order of preference given was formative assessment, followed by self-assessment and evaluation, followed by iCGPA, followed by summative assessment.

Participants were then asked to indicate which assessment method they perceived as being the most effective. In the responses to this question, there were no hesitations or caveats made prior to providing a response. The participants indicated that the assessment method that they felt was the most effective was the iCGPA, followed by the formative assessment. No participant suggested that the summative assessment or the self-assessment and evaluation were the most effective options out of the assessment methods employed.

The next question asked of participants whether they would be willing to switch assessment methods to one that was more effective than their current method of summative assessment, given their ability to do so. All participants indicated that they would prefer a more effective method than the use of summative assessment practices in the identification of mastery of learning objectives. As one participant mentioned, "Summative assessment is the standard right now, but that does not mean that it is the best option available. The process of changing from one method of assessment to another can be a long one, and we must work with what we have available to us."

Participants were presented with the results of the effectiveness of the different assessment methods from the quantitative data collection process and

asked to comment on those results regarding the efficiencies recorded. The responses were mixed. Ten of the participants indicated surprise that the iCGPA method was identified as the most effective overall. Fifteen of the participants indicated that they were not surprised that summative assessments were documented as the least effective method for use. The other five participants indicated that they thought that the use of formative assessments would be higher, but that they could see the validity of the results collected and documented, and that the information appeared to be in line with the responses that they themselves had provided.

When reviewing and synthesizing the data collected with the data obtained as a result of the literature review, the results of the study are unsurprising. Applying Lakatos's philosophy of science to the matter, it becomes possible to see that the change to the use of the iCGPA assessment method would make the most sense in terms of improving efficacy within the context of the holistic environment (Han, 2014). Furthermore, the lack of surprise that the summative assessment practice was the least effective, combined with the fact that the quantitative data collected indicated that the summative assessment method was the least effective indicates that, applying Lakatos's philosophy of science, a shift away from its use should be in order, and should be recommended for immediate transition if the holistic environment is one that will truly provide a total learning experience for the students (Han, 2014). Teachers are aware that the summative assessment method is not the most effective practice and feel as though steps should be taken to address the issue and improve the quality of education being received by the students (Bowe, Ball, & Gold, 2017; Eisner, 2017; Ellis, 2014). If improving the holistic education experience, and indeed the educational experience for students in general is to be accomplished, the next logical course of

action suggested would be to change the assessment methods employed within the classroom environment to the method that best suits the learning style being incorporated within that classroom setting (Armstrong et al., 2016; Bhushan, 2015; Han, 2014; Lauricella & MacAskill, 2015; Mahdavinia & Shoja, 2013; Suhid et al., 2014). As such, the implication of the study is that the implementation of the iCGPA assessment method within the holistic learning environment would better serve the students toward the accomplishment of their overall educational goals while allowing the teachers to provide an additional support structure within that school environment (Armstrong et al., 2016; Bhushan, 2015; Han, 2014; Lauricella & MacAskill, 2015; Mahdavinia & Shoja, 2013; Suhid et al., 2014).

5. Conclusion

The purpose of this study was to explore the measurement of student learning outcomes in a given education environment, in this case, within the context of an entrepreneurial school setting that had already implemented a holistic learning environment. In order to accomplish this task, quantitative and qualitative data were collected from teacher participants working within the same entrepreneurial school that had recently, two years past, implemented a holistic learning environment. The quantitative results indicated that the iCGPA assessment method was the most effective for implementation within this type of learning environment. The qualitative data collected indicated that while teachers preferred the use of the formative assessment method, that the iCGPA assessment method was the most effective, responses that were in line with the quantitative data collected. The effectiveness of the assessment method was identified by the teachers based on the comparison of the four different assessment methods and indication of the effectiveness of those methods by the teachers on a per assignment

basis. While teachers indicated that the difficulty at this point and time was not the identification that the summative assessment method currently implemented was the least effective, something that the majority was already aware of, the difficulty would be in changing the assessment methods used within the context of the school setting.

Several recommendations were identified for the recreation of the study. The first recommendation would be to obtain advance permission from the school to obtain student assessment data to make an objective determination, outside of the reliance upon teacher analysis of the most effective of the four methods of analysis. The second recommendation was to implement each of the different assessment methods across different classrooms to determine effectiveness within the context of the classroom setting, knowing that variation could be present due to the fact that the students would be different and as such could cause variation in identified effectiveness level. The third recommendation would be to implement different assessments across different classes taught by the same teacher, allowing a comparison of effectiveness between the different student groups over the same material being taught in the same manner by the same teacher, and thus working to increase the amount of variable control present within the context of the study.

When it comes to recommendations for areas of future study, there are several recommendations that can be made in this regard as well. It is recommended that additional studies be conducted to determine the effectiveness over time for the application of the different assessment methods to ensure that the results obtained herein are not the sole result of a short term application of those assessment methods. It is further recommended that an additional study be conducted to explore the matter from the student perspective. It is recommended that, in order to accomplish this task and compare the assessment effectiveness results between this study and that, that the

researcher provides a test of objective knowledge to the students to have a starting point for measurement. Following the application of a single alternative assessment method within the course for each student, the researcher should have students complete the assessment of student progress once more to determine which student group under which alternative assessment model displayed the highest retention of learning objectives, allowing for the identification of the most effective assessment method, which could then be compared to the results of this study in order to confirm the most effective method identified. In this manner, it would not only be possible to further the current body of literature, it would also be possible to better confirm the results of this study. With the identification of effectiveness, the higher the amount of confirmation of results, the more likely those results are to be accepted, offering the foundation on which the advancement of educational improvement can occur.

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