Alignment of Intended Learning Outcomes with Quellmalz Taxonomy and Assessment Practices in Early Childhood Education Courses

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Abstract

The aim of this study is twofold: (1) to investigate the alignment of the course intended learning outcomes with Quellmalz Taxonomy; and (2) to investigate the alignment of the course intended learning outcomes with assessment practices in early childhood education courses.

Data have been gathered from different sources for the purpose of qualitative and quantitative approaches. The data consisted of overall course outcomes, all formal assessment papers used in the mid-term, final – term assessment and in – depth interviews with the instructors who teach 8 randomly selected childhood education courses. The results of the study have shown poor reflection of Quellmalz Taxonomy in the learning outcomes and weak alignment between the intended learning outcomes and the assessment practices of the sample courses used at the end of the semester. A list of recommendations has been suggested to improve the alignment of intended learning outcomes with Quellmalz Taxonomy and assessment practices.

Keywords: Alignment, Intended Learning Outcomes, Quellmalz Taxonomy, Assessment Practices, Early Childhood Education.

1. Introduction

1.1   Intended Learning Outcomes

Alignment is the process of analyzing how explicit criteria are built upon one another within a particular pathway. For this to happen, intended learning outcomes, instructional strategies and assessment practices need to be closely aligned so that they reinforce one another. Therefore, alignment is a means for understanding the degree to which different components of an educational system work together to support a common goal (Martone & et al. 2009). Biggs (2011) suggests that intended learning outcomes come first, the learning activities second and the assessment practices third. They help to make the overall learning experience more transparent and meaningful for students, ensure that the assessment practices are designed to assess the learning outcomes, and act as the compass that guides and directs a broad range of purposeful action (Ambrose, 2010). Failure to do so could result in missing the essential skills we aim to impart.

To ensure that the intended learning outcomes of the course, and the assessment practices are aligned, the teacher must ask his/her self the following two questions:
 1-   What do I want students to know, feel and be able to do when they complete the course?
 2-   What kinds of tasks will reveal that students have demonstrated the learning outcomes I have specified?

Therefore, learning outcomes provide a basis for measuring and reporting on students' academic achievement, and the key to effective course design is to have alignment between what the students will learn, and how they will be assessed.

Nevertheless, learning outcomes should not be used in a tokenistic way, rather they should be delivered to students so that they can articulate the knowledge, attitudes and skills they have acquired (McCarthy, 2001; Kennedy, 2009).

An outcome is simply a result or consequence of an action or process; it includes action verbs that are observable and measureable, specify an action that is done by the students rather than the instructors, and describes what students will be able to do on completion of a particular learning experience. Effectively developed intended

learning objectives should possess all three of these characteristics (observable, measureable, and student-centered) .In a nutshell, intended learning outcomes (ILO's) describe the attributes and capabilities that students should be able to display upon completion of the course, they must indicate the behavior of the learner that is to be tested, and focus on what the students will learn, rather than on how the instructor will structure their learning (McNeill & et al. 2012).

Consequently, assessment must match the learning expectations. It should reveal how well students have learned what we want them to learn; while instruction ensures that they learn it (Biggs, 1996). They must be capable of being validly assessed, and need to be S.M.A.R.T. This is an acronym which means that intended learning outcomes should be specific, measurable, attainable, results-oriented, and time-framed. They must be constructively aligned, learning focused, equitable and rigorous (Angelo, 2013). These outcomes are called intended outcomes, because in good learning environments, students also learn many additional things, which are not necessarily included in the intended learning outcomes. They are called unintended learning outcomes or the hidden curriculum.

By aligning assessment practices with intended learning outcomes numerous benefits can be achieved: it can explain what is expected of the students, inform potential employers and stakeholders about the knowledge and skills that students will possess, provide direction and stability in the course, and transfer the broad goals to specific outcomes.

Furthermore, aligning assessment with ILO'S can improve the efficiency and effectiveness of the educational system and serve as an inventory to help assure that all outcomes are being assessed in some way (Crespo, 2010; Hougton, 2004).

Biggs (2003) notes that aligned curriculum means that intended learning outcomes are clear, and carefully designed assessment practices allow students to demonstrate achievement of those outcomes.

In setting up an aligned curriculum three steps must be taken:

1- Specifying the desired outcomes of teaching activities;
2- Setting up an environment that is conducive to learning; and
3- Choosing assessment tools and instruments that will tell us how well students have attained the desired learning outcomes.

1.2 Assessment Practices

Assessment as a quality assurance indicator is at the heart of student learning. It is the art and science of knowing what students know, feel and are able to do. It is a central steering element and important single component in student learning, and is the engine that drives learning (Cowan, 1999). It describes any processes that appraise a student's specific knowledge, attitudes, and practical skills and measures progress of students against expectations. Furthermore, it collects evidence about student learning that we can use to improve and make judgments about learning (Wiggins & McTighe, 2006).

Studies of assessment practices have been conducted to determine the alignment of these practices with intended learning outcomes (Boud, 2006). Therefore, it is imperative when designing assessment practices to make sure that the assessment matches the learning outcomes of the course (knight, 1999; Suskie, 2009).

Assessment plan must lay out a well thought out selection of assessment tools that are aligned to the objectives of the subject matter, since not every assessment tool is universally valid for every type of learning objective (Thandi & et al. 2013). The tools must be appropriate for ascertaining whether or not the desired outcomes have been attained. Therefore, different assessment measures must be integrated into the courses and then these measures must be analyzed and evaluated.

There are three domains of intended learning outcomes:

- Cognitive domain: what do you want your students to know?
- Affective domain: what do you want your students to feel and care about?
- Motor domain: what do you want your students to be able to do?

Successful course assessment begins with a clear sense of what the course is designed to accomplish. According to Palomba & Banta (1999), assessment involves the systematic collection, review and use of evidence or information related to students' learning. It provides feedback to students about their learning and adjusts teachers' teaching methods to ensure greater student learning (Maki, 2004). It also captures student attention and effort, provides feedback to students, and ensures accountability. On the other hand, aligning the assessment with learning outcomes means that students know how their achievements will be measured. Edstrom (2008) argues that assessment, together with intended learning outcomes and learning activities should be regarded as essential

elements of constructive alignment. Brabrand (2007) notes that alignment tells us how we can make sure our students learn what we want them to learn. If learning outcomes and assessment are not aligned, the course may be fragmented and ineffective.

However, assessment of intended learning outcomes often does not cover anticipated long-term learning, and mostly concentrates on quantitative aspects of learning.

1.3   Quellmalz Taxonomy

A taxonomic analysis of the intended learning outcomes of the curriculum should be conducted before the start of the course.

Taxonomy is a framework for classifying the challenge in learning outcomes. It provides the structure for writing outcomes. Edys Quellmalz looked on learning as a process, where we build upon our former learning to develop more complex levels of understanding. She argues that people use different levels of thinking skills to process different types of information and situations. Some of these are basic cognitive skills such as "recall", while others are complex skills such as "inference".

This taxonomy provides a simple and useful reference point to enhancing the connections between subject outcomes and assessment practices, and provides the structure for writing learning outcomes.

Quellmalz (1987) proposed that intended learning outcomes are composed of five successive levels arranged in a hierarchy.

These five levels are:

1- Recall: recall questions require students to retrieve facts in the same format of which they were learnt.

   Sample trigger words: define, name, and list.

2- Analysis: analysis questions require students to divide a whole into component elements, and understand relationships between the whole and its component parts, and between cause and effect. It involves reflectively structuring knowledge in new ways.

   Sample trigger words: analyze, state a relationship, and give an example.

3- Comparison: students are required to recognize or explain similarities and differences.

   Sample trigger words: compare, distinguish, and contrast.

4- Inference: inference questions require students to reason inductively or deductively.

   Sample trigger words: synthesize, conclude, and solve.

5- Evaluation: evaluation questions require students to express and defend an opinion.

   Sample trigger words: judge, justify, and critique.

2.   Review of Literature

The importance of aligning ILO's with assessment practices has been well articulated in the literature. A curriculum that is aligned with intended learning outcomes and assessment practices has been promoted as best practice within the higher education sector (Heron, 2011), and the success of any learning environment is determined by the degree to which there is alignment among all critical factors that create an environment conducive to teaching and learning (Reeves, 2006). It underscores the educational experience being learner-centered and activity-based instead of being teacher and content based (Awwad, 2010). All educational activities along with assessment practices need to be aligned with intended learning outcomes (Najjar & et al. 2010).

Burger (2008) examines the alignment of teaching, learning and assessment. She concludes that although teachers are aware of the importance of the alignment of teaching, learning and assessment, they do not understand the assessment standards attached to each learning outcome.

ILO's act as the compass that guides and directs a broad range of purposeful actions (Karkehabadi, 2013), and assessment produces evidence of how students have learned what we intended them to learn.

Oberg & et al. (2010) examined teachers' views about different formats and methods of assessment. They concluded that students' perceptions about assessment have considerable influence on their approaches to learning.

Shiekh & et al. (2013) adopted a qualitative approach to explore the gap between the intended learning outcomes and the assessment instruments in the universities and their affiliated colleges in the Punjab province. They point to the lack of alignment between the intended learning outcomes and the formal assessment practices used at the end of the semester.

Naomee & Tithi (2013) examined the reflection of Bloom's Taxonomy on the learning outcomes of secondary social science curriculum of Bangladesh. The study found uneven application of the Bloom's classification of objectives and poor reflection of Bloom's Taxonomy on learning outcomes of the curriculum.

The present study adopts qualitative and quantitative approaches to examine the alignment of ILO's with Quellmalz Taxonomy and assessment practices in 8 randomly selected courses. The study is first of its nature in the field of early childhood education at the University of Petra, Jordan

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3.   Aim of the study

The aim of this study is twofold: (1) to investigate the alignment of course learning outcomes with Quellmalz Taxonomy; and (2) to investigate the alignment of assessment practices with course learning outcomes.

4.   Limitations of the study

   The study is limited to 8 courses in early childhood education program, so the researcher makes no claim that the findings are generalizable to other settings.
- The findings of the study are emerged from the data collected in short duration of one semester.
- Only the mid-term and final-term exams are included in the document analysis of the said semester.

5.   Operational Definitions

Alignment means that all elements are interdependent and form a system and send the same message. It refers to the explicit linkage and the congruence that must exist between the ILO's and the assessment tasks.

Intended Learning Outcomes are statements that predict what students will know (cognitive), feel (affective), and be able to do (skills), as a result of engaging in the learning process.

Quellmalz Taxonomy is a common tool used to assist with the writing of learning outcomes. This taxonomy is based on the premise that what instructors want their students to learn can be arranged hierarchically from less to more cognitively complex tasks

Assessment Practices are tasks that will reveal whether students have achieved the learning outcomes identified by the instructor at the desired standard. They make inference on the basis of evidence, and reveal how well students have met the intended learning outcomes

Early Childhood Education refers to educational programs and strategies geared toward children from birth to the age of eight. These years lay the foundation for subsequent learning and development.

6.   Sample of the study

 Eight randomly selected courses were the focus of this study. The courses were:
- Music and Drama in Teaching
- Creativity in Childhood
- Child Health & Nutrition
- Child Problems & Behavior Modification
- Social & Religious Concept Development
- Inter – Personal Skills Among Individuals
- Contemporary Issues & Trends in Child Education
- Family Upbringing of the Child

7. Methodology

The study has been carried out based on the descriptive mode of research. Data have been gathered from different sources for the purpose of qualitative and quantitative approaches.

The study aims to examine the alignment of learning outcomes with Quellmalz Taxonomy, and to examine the alignment between the proposed course intended learning outcomes and the traits being assessed by mid-term and final-term exams. Qualitative data analysis has been employed to unravel the assessment tools and the intended learning outcomes. Some quantitative measures have also been used to give a clear picture to document analysis.

The data consist of overall course outcomes, all formal assessment papers used in the mid-term and final – term assessment, and in – depth interviews with the instructors.

In-depth interviews and document analysis are the main techniques used in this study. In analyzing the interviews, continuous listening, reflecting and interpreting of the interview material were conducted.

The mid-term and final assessment exams and the intended learning outcomes of the selected sample course were collected and analyzed. A comparison was then made between both types of documents. The basic unit of analysis was the assessment practices and the intended learning outcomes for analyzing the alignment between the two documents by using Quellmalz Taxonomy. A comparative analysis was rendered to estimate documents of the selected courses, to get an insight about the learning outcomes, assessment practices, and Quellmalz Taxonomy. Instructors were interviewed in order to gain knowledge about their thoughts regarding selecting learning outcomes, using Quellmalz Taxonomy in writing outcomes, and aligning assessment practices with the outcomes. The intention is to understand assessment methods used by interviewing the instructors about their perceptions of assessment in their own teaching practices. The instructors were asked to identify some of the key learning outcomes in their courses and the strategies they used to align assessment with student learning outcomes.

An inventory of cognitive traits embedded in the intended learning outcomes of the selected course was developed in accordance with the Quellmalz Taxonomy. Most of the instructors (92%) argued that learning cognitive outcomes should be classified according to Quellmalz Taxonomy.

For data collection, two types of instruments were formulated:
1- An inventory of content and cognitive traits embedded in the intended learning outcomes was developed in accordance with Quellmalz Taxonomy.
2- A formal checklist was prepared on the basis of the cognitive process dimension (trigger verbs) with respect to five cognitive levels of Quellmalz Taxonomy.
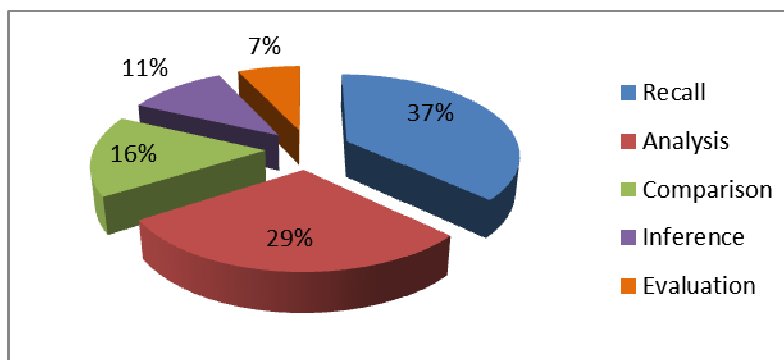
8. Results and Discussion

Table (1): Distribution of intended learning outcomes for the (8) selected courses based on Quellmalz Taxonomy

Objective	Number of intended learning outcomes	Percentage	Ideal distribution percentage	Shift from ideal distribution
Recall	72	37%	20%	+ 17%
Analysis	56	29%	20%	+ 9%
Comparison	32	16%	20%	- 4%
Inference	22	11%	20%	- 9%
Evaluation	14	7%	20%	- 13%
Total	196	100%	100%	

A complete picture of the percentage distribution and number of intended learning outcomes for the 8 selected courses in accordance with levels of Quellmalz Taxonomy is presented in the pie chart below which shows the percentage of each cognitive sub –domain of Quellmalz Taxonomy:

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Pie Chart N0.1

It is revealed from the pie chart No.1 that out of 196 intended learning outcomes for eight early childhood education courses, 37% are related to the first level (recall), whereas 29% are related to the analysis level, 16% to comparison, 11% are related to inference, and only 7% to evaluation. The highest priority has been given to the recall and analysis levels, whereas, assessment instruments should encourage students to think instead of merely recall facts.

Table (2): Distribution of questions for the (8) selected courses based on Quellmalz Taxonomy

Objective	Number of questions	Percentage	Ideal distribution percentage	Shift from ideal distribution
Recall	330	69%	20%	+ 49%
Analysis	88	18%	20%	2%-
Comparison	40	8%	20%	12%-
Inference	12	3%	20%	17%-
Evaluation	10	2%	20%	18%-
Total	480	100%	100%	

A complete picture of the percentage distribution and number of questions for the 8 selected courses in accordance with levels of Quellmalz Taxonomy is presented in the pie chart below which shows the percentage of the number of questions.

Pie Chart No.2
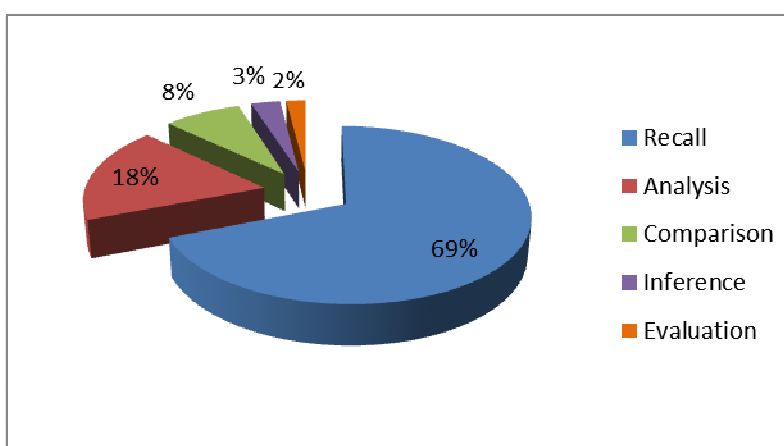
It is revealed from the pie chart No.2 that out of 480 questions, 69% are related to recall, whereas 18% to analysis, 8% to comparison, 3% to inference, and only 2% to evaluation.

Following are the specific results of the study:
1- The instructors have intuitively been aware of the importance of the alignment of intended learning outcomes with Quellmalz Taxonomy and assessment practices.
2- The implementation of the alignment has not been explicitly planned by the instructors.
3- There is poor reflection of Quellmalz Taxonomy in the learning outcomes of the early childhood education courses.
4- All levels of Quellmalz Taxonomy have been given weight in the outcomes of the selected courses, though this distribution of learning outcomes is not balanced. The biggest share has been given to the

recall, analysis and comparison sub- domains, whereas in the construction of assessment practices, recall and analysis have been given fair weight.

5- The main focus of the intended learning outcomes and assessment practices is confined to the lower order thinking skills especially the factual recall. Beside, the assessment practices used are very limited in effectively testing and ultimately developing higher order thinking skills. At the university level, assessment practices which focus on the lower-cognitive thinking skills such as "recall" are not justifiable. Instead, we need to design exams that can engage our students in higher order thinking skills such as critical thinking, problem solving, creativity, inference and evaluation that will be valuable beyond their academic lives.

6- There is weak alignment between the intended learning outcomes and the assessment practices of the sample courses used at the end of the semester. The learning outcomes are not consistent with the assessment practices. If assessment instruments are not aligned with learning outcomes, this can undermine both student activities and learning (Webb, 1997).

7- Though the intended learning outcomes concentrate on the first three levels of Quellmalz Taxonomy (recall, analysis and comparison), the assessment practices concentrated mostly on the first two levels (recall and analysis).

This is due to a number of factors:
a. Measuring the first two levels is easy to conduct.
b. The use of online tests makes it harder to test the upper level thinking skills, especially when the instructors use only the multiple-choice test. In many cases, this type of test is not suitable for measuring the higher order thinking skills. It requires students to recall or recognize terms, factors, concepts and principles.
c. The instructors can justly and easily defend the marking of students' test papers.
d. The assessment practices match the content of the course and the instructional techniques.

9. Recommendations:

The following is a list of recommendations that, one believes, if implemented would contribute positively to the alignment of ILO's with Quellmalz Taxonomy and assessment practices:

- Equal emphasis should be given to all the cognitive levels of the Quellmalz Taxonomy in order to give the students proper knowledge.
- Constructive alignment should be established between the intended learning outcomes and the assessment practices.
- Instructors should be properly trained on writing and measuring the intended learning outcomes, and on using rubrics which assess how well students meet learning outcomes. This rubrics work as a quality continuum from exceptional to not satisfactory.
- Further research should be carried out to investigate the alignment of the three critical elements of teaching: intended learning outcomes, teaching strategies and assessment practices. In constructive alignment, an instructor starts with the intended learning outcomes, and aligns teaching strategies and assessment to those outcomes. This, in turn, optimizes the conditions for quality learning.
- Further research should be carried out in other areas besides the early childhood education to explore how the assessment practices and pedagogical practices are a reflection of the intended learning outcomes.
- Further discussion about the issues highlighted in this study should take place with faculty members across the different academic programs.

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