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The Relationship between Assessment Practices and Students' Academic Performances. A Case of Undergraduate Students at the Medical School of the University of Zambia, 2008 – 2016

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Abstract

The University of Zambia, School of Medicine has remained a premier academic institution that prides itself with exceptionally high outcomes. In order to delve this issue, this article investigated the relationship between assessment processes and students' academic performance among undergraduate medical students trained at the University of Zambia, School of Medicine during the years from 2008 to 2016. A mixed methods approach involving qualitative and quantitative methodologies was employed to investigate the above-mentioned issue. An explanatory sequential research design was used for data collection. Data was captured using an evaluation survey instrument, students' Focus Group Discussion schedule and an in-depth interview schedule for key informants regarding the GPA and examination attritions. Quantitative data from the first set were analysed using descriptive and inferential statistics while qualitative data from the second set analysed using constant comparative method. The article revealed during the period under study that there was little timely feedback (47.8%) and, where it was done, it lacked guiding comments (48%). In addition, the article revealed that 28.8 per cent assessment tasks were misaligned with learning objectives. In conclusion, the article showed that the low students' GPA and high examination attrition rates at the Medical School of the University of Zambia were due to improper assessment processes. In view of these findings, the article recommended that assessment tasks should be aligned with learning objectives and that feedback should be given to students on time and should be detailed.

Key words: *Quality of Education, Examination Attrition Rates, Grade Point Average, Assessment*

Background and Context

The University of Zambia, School of Medicine has continued to be a prime institution of the Government of the Republic of Zambia in health education. It has sent out not only Doctors but also Pharmacists, Biomedical Scientists, Physiotherapists, Environmental Health Officers and Nurses who have made a real difference in the Zambian society. It has been true to its motto of "Service and Excellence". It has also performed quality research which has influenced policy and practice and has greatly contributed to quality clinical service. The aspects of improving quality research, which inputs in policy and practice at the University of Zambia, is well argued by Masaiti and Mwale (2017).

Increases in examination attrition rates and low-Grade Point Average (GPA) are growing concerns in most higher learning institutions (Tyre-Smith, 2010). Student

attrition in higher education has remained a much studied but little understood phenomenon. From the School of Medicine, the GPA and examination attrition rates for the years 2008 and 2014 were analysed and from Table 1 below it was found that in all programmes the GPA on average was less than 3.0.

Table 1: Grade Point Averages from 2008 to 2014

PROGRAMME	2008	2009	2010	2011	2013	2014
BSc ENV. HEALTH	2.15	3.27	2.85	2.53	1.97	3.22
BSc PHYSIOTHERAPY	1.65	2.42	2.61	2.12	2.24	3.10
BSc BIO SCIENCES	2.63	2.63	1.73	3.07	2.10	2.73
BSc PHARMACY	1.92	2.30	2.05	2.10	2.47	2.62
BSc Nursing Sciences	2.71	3.11	2.73	2.90	2.20	3.30
MB ChB	1.95	1.67	1.73	1.86	2.09	2.15
AVERAGE	2.16	2.57	2.28	2.43	2.18	2.85

Source: Daka, 2019

In the case of examination attrition rates from Table 2, results showed that they ranged from 3.03 per cent 2008 to 24.94 per cent in 2014. In all the other years apart from 2008, the average examination attrition rates were above 10 per cent. Tyre-Smith (2010), posits that if the examination attrition rates are more than 10 per cent, there is need for investigation in order to come up with strategies of improving quality of education thus the reason this study was conducted.

Table 2: Examination Attrition Rates (%) from 2008 to 2014

PROGRAMME	2008	2009	2010	2011	2013	2014
BSc ENV. HEALTH	6.67	0.00	6.25	8.75	4.00	14.7
BSc PHYSIOTHERAPY	7.50	20.00	21.50	6.50	25.0	10.0
BSc BIO SCIENCES	0.00	4.33	12.30	6.00	19.0	41.0
BSc PHARMACY	0.00	15.50	12.00	15.00	18.0	29.0
BSc Nursing Sciences	0.00	11.50	10.00	12.00	20.0	7.50
MB ChB	1.00	30.00	14.00	17.00	12.0	30.0
AVERAGE	2.53	13.55	12.68	10.88	16.33	22.03

Source: Daka, 2019

The study measured educational quality at the University of Zambia, School of Medicine from 2008 to 2016 by establishing the relationship between assessment processes on one hand, and examination attrition rates and Grade Point Average (GPA) on the other. This was done through the evaluation of assessment practices.

The idea for the study stemmed from the phenomena observed by the researcher that despite the School of Medicine selecting and admitting the highest performers from the School of Natural Sciences and having projects like the Department for International Development (DFID) from 1995 to 2000 and Medical Education Partnership Initiative (MEPI) from 2011 to 2015 which aimed at improving the quality of teaching, the School of Medicine still recorded low students' GPA and very high examination attrition rates, as shown in Table 1.1 and Table 1.1 respectively, for the period 2008 to 2014. In view of this situation, the School of Medicine would benefit from objective data to determine if assessment processes affect the student GPA and examination attrition rates.

Different authors have suggested different causes of high attrition rates and low GPA. Therefore, identifying reasons why students fail and get low GPA is critical in determining the quality of services and delivery methods a particular learning institution would need to put in place (Sampson & Karagiannidis, 2010). The factors leading to low GPA and high examination attrition rates need to be understood as this has not been understood even in the case of the Medical School at the University of Zambia. Many studies (Sulaiman and Mohezar, 2006; Perna and Thomas, 2006 and Susan, David and Deborah, 2011) have been carried out to investigate the causes of these variables. However, depending on the setting, the predictors might be different.

Assessment is defined as a systematic collection, review, and use of information about educational programmes undertaken for the purpose of improving student learning and development (Coverdale, Roberts, Balon & Beresin, 2013). In fact, Mulenga and Kabombwe (2019a:124) clearly puts it that 'the success of a curriculum is realised by the way teachers measure learner achievement through assessment of learning'. Assessment can either be formative evaluation as an on-going process throughout the course (this is referred to as modifying and adjusting) or summative evaluation which occurs at the end of the course and is most often the model used in academic institutions. If instructors are truly establishing a collaborative, transformative process, then both forms of evaluation need to occur (Mukuka and Daka, 2018).

From the definition above, some of the questions which may arise are the type of assessment tools used and the weighting of these tools. The current argument has been that "all educators should demonstrate that they are assessing skills and competencies necessary and relevant to the course taken" (Borich, 2000; 7). Mulenga and Kabombwe (2019b:118-119), further explained that 'through the competency based curriculum, learners will be expected to acquire three critical educational elements namely; worthwhile skills, appropriate attitudes and applicable knowledge which make up competences. Competences are abilities critical to the performance of specific tasks'. The assumption has been that if the educator is assessing what he or she taught, there should not be many students

failing in that course. If many students fail, then the assessment tools need to be investigated.

Two issues were investigated in this study. These were feedback and validity and reliability. Feedback processes and its role as a predictor of GPA and examination attrition rates was considered first.

Feedback

The subject of feedback has been extensively explored and theorised. Hattie and Timperley (2007), formulated a theoretical framework on feedback which can be applicable in a learning context. The framework helps to understand how feedback contributes to learning. There are four levels in this framework. **Level 1:** Personal Feedback: This is the type of feedback given to an individual that can be either positive or negative depending on the learner's performance. An example is when the lecturer writes comments praising the student's mastery of content in order to boost that student's confidence (Mubuuke, 2018). **Level 2:** Feedback regarding the task: This focuses on the task and how well the student is tackling it, but does not focus on the individual (Mubuuke, 2018). For this to be effective, the task must be made in such a way that it involves analysis and formation of concepts thereby encouraging a deep approach to learning as also described by Husain and Khan (2016). **Level 3:** Feedback about processing of the task: This level of feedback is given when learners apply what they have learnt in a particular task to another situation. This is in line with how the curriculum is developed where topics are sequenced in such a way that concepts are arranged in a manner where they build on each other (Van Dijk and Kluger, 2011). Students use the knowledge acquired at earlier levels to solve more challenging or untried tasks (Mubuuke, 2018). **Level 4:** Feedback regarding self-regulation: This is feedback that enables learners to monitor, regulate, and control their cognition, motivation, behaviour and the guidance of the environment. This is a very important level in feedback as it is at this level that feedback from lecturers triggers the students to also engage in the process of self-assessment and critique (Bowen, Marshall & Murdoch-Eaton, 2017).

Other authors added on the above theoretical framework. To start with, Riley (2008) observed that if students are not given feedback, they make similar mistakes and even fail in most course assessments. He further argues that the immediacy of the response provides students with the feedback necessary for learning. He also pointed out that if feedback delays or is not provided, students will not know whether they have failed or are correct and when a similar question comes in the examination, students make the same mistakes. Such practices might result in high examination attrition rates.

Hughes (2011), also explained that feedback process does not only drive learning, but also improves the facilitation of that learning process. Therefore, feedback from lecturers needs to be detailed so that it allows learners to reflect on the task and do some self-assessment. In addition, (Orsmond, Maw, Park, Gomez & Crook, 2013) added that feedback should be given in such a way that learners are encouraged to seek further guidance and clarification from lecturers for more understanding. The literature reviewed showed that lack of detailed feedback lowers students' GPA and increases examination attrition rates.

Validity and Reliability of Assessment Tools

The validity of assessment is vital and, as a consequence, there is an increasing drive towards the development of instruments that can be used in the practical setting to sample across a wide range of contexts and judge (Van Der Vleuten, and Schuwirth, 2005). Validity refers to whether an instrument actually does measure what it is purported to. The validity of any method of assessment could be improved substantially if assessment designers would respect the characteristic of authenticity (Norcini, Swanson, Grosso and Webster, 1985; Masaiti, 2018).

Apart from validity, reliability of the assessment tools is also vital. Reliability refers to the reproducibility of the scores obtained from an assessment. It is generally expressed as a coefficient ranging from zero (no reliability) to one (perfect reliability). Often 0.80 is regarded as the minimal acceptable value, although it may be lower or higher depending on the examination's purpose - for instance, it will have to be higher for a licensing examination (Schuwirth and Van Der Vleuten 2012). The predominant condition affecting the reliability of assessment is domain or content specificity because competence is highly dependent on context or content. This means that one will only be able to achieve reliable scores if one uses a large sample across the content of the subject to be tested (Cook, Kuper, Hatala and Ginsburg, 2016).

Test-curriculum alignment and content validity are important for most educational test validity arguments. Any assessment tool should be reliable, valid, feasible and acceptable to learners and assessment leads. It should also be effective in relation to its cost, and it should have educational power (Smith, Dollase and Boss, 2003). In order to examine the acceptability and feasibility of the assessment tool, it is important to take into consideration the time available to complete the task (Van Der Vleuten, 1996).

Method and Design

In this study, mixed method research design was used. This study used the explanatory sequential design mixed methods in a diagnostic way. In explanatory sequential design the researcher begins by conducting a quantitative phase and follows up on specific results for the purpose of explaining the initial results in depth (Subedi, 2016). This design is also explained by Kabombwe and Mulenga

(2019:27) that ‘the rationale for this approach is that the quantitative data and results provide a general picture of the research problem; more analysis, specifically through qualitative data collection is needed to refine, extend or explain the general picture.’

The study was conducted at the University of Zambia-School of Medicine situated at University Teaching Hospital (UTH) and The Ridgeway Campus. The target population for this study were all undergraduate students in the School of Medicine of the University of Zambia, Assistant Dean (General), Heads of Department (HODs), Lecturers and Laboratory Technicians of the School. Some of the students formed the study sample because they were all participating in learning. In this study, a sample of 800 respondents in the School of Medicine for all years of study and programmes, were targeted. Sixteen of these were key informants to the study, 784 were students studying in different programmes.

In order to investigate how assessment affects the student’s GPA and attrition rates, the survey questionnaire was administered by the researcher to students, the In-depth interviews were conducted with the key informants, Focus Group Discussions were conducted with the students and document reviews were done from the past examination results. Before the study commenced, the tools were discussed by the School of Medicine Board of Studies to seek clearance from the school. The study was approved by the University of Zambia Biomedical Research Ethics Committee (UNZABREC). In order to enhance confidentiality and ethical issues, data entry was done by students outside the School of Medicine and double entry was used in order to reduce errors encountered during data entry. This quantitative data was analysed using the Statistical Package for Social Sciences (SPSS Version 20) to generate simple descriptive statistics. For qualitative data, the study used the constant comparative method as described by Bryman (2004). The triangulation of methods of data collection yielded in-depth information on the phenomena of high examination attrition and low GPA among students of the School of Medicine. Key documents analysed provided valuable information for discussion.

Findings

The response rate was 84.1 per cent. For qualitative data, participant responses from the interviews and focus groups were audio recorded and transcribed. For analysis of the transcriptions, thematic analysis was used in which raw data was coded. The developed codes were further related, resulting into categories and subsequently into themes. The responses from the student interviews and focus group discussions were supported by key findings from the questionnaires and document reviews. For quantitative data, the responses under assessment standards characteristics of examinations were averaged and the mean and standard deviation were calculated using SPSS. All the results were analysed according to the programmes under study.

On the overall, the descriptive statistics involving the mean and standard deviation of the respondents' perceptions on the characteristics of the assessment standards were as shown on Table 3 below:

Table 3: Perceptions of Assessment Practices

Programme of Study	Timely feedback %	Detailed feedback %	Matched the scope %	Promoted memorising %
MB ChB	42	44	60	76
BSc Biomed	60	59	80	68
B. Pharm	60	61	76	66
BSc Physio	46	47	67	73
BSc Env	53	49	73	64
Average	52.2	52.0	71.2	69.4

Source: Daka, 2019

Table 1.3 shows that on timely feedback, just above half (52.2%) of the respondents stated that the feedback was timely while the rest (47.8%) stated otherwise. This was in agreement with the participants' responses from the Focus Group Discussions (FGDs) that:

'we rarely get the feedback and if given, with few or no comments'. Another one added that, 'we do not get the feedback from assignments and laboratory work. Students also added that the feedback given does not help them as they are not detailed enough time provide guidance. In addition, one of the discussants said that, 'in some courses we go for examination without knowing our Continuous Assessment grades'. Some lecturers interviewed agreed with the students that they fail to give students the Continuous Assessment.

One interviewee said:

'I have challenges with marking students' work on time due to large number of students in their courses'.

In addition to feedback, the results showed that the feedback given was on average not detailed to provide guidance to the students with an average percentage of 52 per cent demonstrating that the respondents were not satisfied with the feedback given This also was in agreement with the one participant from the FGDs who stated that:

'that the feedback given does not help them as they are not detailed enough time provide guidance'.

Concerning the characteristic of assessment matching with the scope material covered, apart from the respondents in MB ChB programme where the percentage was 60 per cent, all other programmes had the percentage above 65 per cent indicating that most of the respondents agreed that the assessments marched with the scope. During FGDs, the discussants also mentioned that:

‘Some lecturers assess the content in the examination which was not covered during classes’.

The results from the table also showed that the assessment given in the School of Medicine promoted memorising. In all study programmes, respondents were in affirmation with this as all had the students agreeing with the percentages above 60 per cent.

Discussion

In all aspects of assessments, it is important to note that there is need to come up with some practices which can make the process of assessments bring about effective learning. This was the component which was investigated in this study. One of the best practices which had worked as stated by Black and William (2009) was providing feedback early and often. It has been stated that feedback is the breakfast of champions. It is important to note that feedback must be of quality (informative and guiding). Feedback must also be timely, specific, understandable to the receiver, and formed to allow for self-adjustment on the student’s part. The feedback on strengths and weaknesses will help the learner to improve more. The grade or percentage indicated on the paper does not advance any learning or inform the learner on the corrections which need to be made.

In order to assess more material in the course it is important that assessments are adequate. In any curricula, the numbers of assessment items are stipulated to guide the lecturers. In this study, it was revealed that in some courses, there were inadequate assessments items while in others there were too many, consequently making students to concentrate on one course and failing to balance with other courses. If lecturers followed the guide in the approved syllabi of the courses, the students would benefit and be helped to perform better. It was also revealed that some lecturers gave tests or assignments at will without prior notification.

In this study, it was revealed that some of the items in the tests, assignments and examinations were never covered in class and others brought questions which just required memorising and never included thinking. In such courses the GPAs were very low. This was contrary to what Black and William (2009) emphasised, that assessments are supposed to be valid and must assess the appropriate material. Assessments should reveal how well students have learned what lecturers desired them to learn. In this case, assessments, learning objectives and instructional strategies need to be closely aligned so that they reinforce one another as shown in Figure 1.

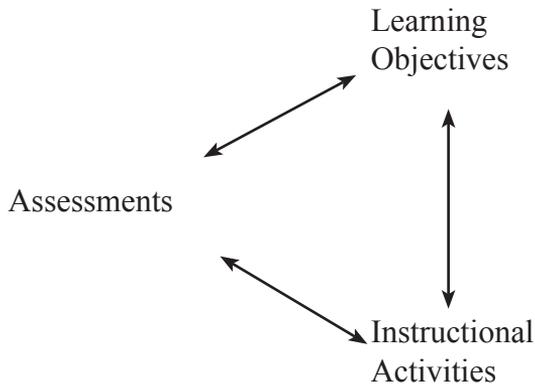


Figure 1: Relationship between Learning Objectives and Assessment

Source: Adapted from Metzler (2017)

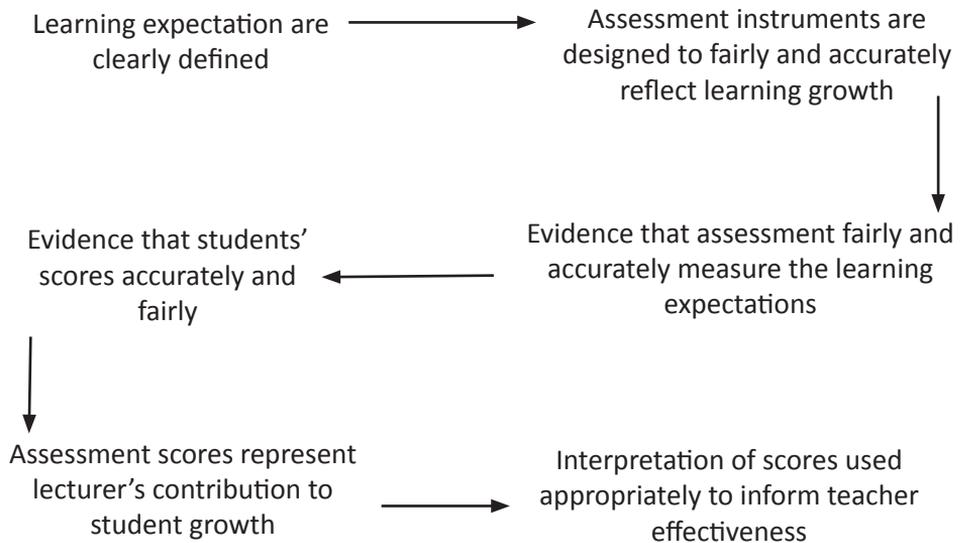
Therefore, assessments should include tasks which can reveal that students have achieved the learning objectives identified by the lecturer. If assessments are misaligned with learning objectives, then students learning and motivation are undermined. In order to align effectively, the following need to be taken into consideration by the lecturer so as proposed by Metzler (2017):

- (i) Tasks should cover all key subject content standards.
- (ii) No items on the test should cover what the syllabus does not address.
- (iii) Number of test items should mirror the distribution of teaching time.
- (iv) The tasks should match the full range of cognitive thinking required during the course where it should even challenge the highest performing students as well as elevating the low-achieving students to also demonstrate their knowledge.

The two major types of assessments were formative and summative. The formative assessment is also known as assessment for learning (Mulenga - Hagane, Daka, Msango, Mwelwa and Kakupa, 2019). Research has shown that students who receive formative assessment perform better and have high GPA (Chappis and Stiggins, 2002). The two authors further define formative assessments as assessments designed to monitor student progress during the learning process. Thus, questions in these forms of assessments should be aligned with the course objectives so that they bring about learning, thereby increasing the academic performance of the learners.

Pokorny and Warren (2016), conclude by using Chart 1.2 that if the correct assessment method is used then it determines teacher effectiveness and improves students' performance.

Chart 1.2: Propositions that Justify Teacher Effectiveness



Adapted from: Riley, 2014

The chart above, if used in the assessment process by lecturers in the School of Medicine, would help in fair assessment of students. Each lecturer would prepare assessment items which would be aligned with the learning objectives as indicated in the flow in Chart 1.2. The academic staff would prepare items which need to be assessed and not what is interesting to the examiner. The students would not be assessed on things not taught. This would result in improvement in students' academic performance.

The study showed that timely and detailed feedback contributed to students' high academic achievement. The lecturers who provided timely feedback and helpful-detailed feedback were regarded as among those with outstanding assessment practices. Courses taught by such lecturers had low failure rates. The study's findings revealed that in courses or cases where lecturers were available for consultation or provided guidance to the students, the students did well. This was the same in courses where lecturers motivated their students through words and encouraged critical thinking. Assessments are no longer a tool for controlling students' behaviour but for checking if they demonstrate the competences established in the courses. Thus, students' assessment results guide teachers to help them toward academic success. This shift of educational assumptions can reduce the examination attrition rates and increase the students' GPA.

From the findings above, it was confirmed that there was an association between assessment processes and the Grade Point Average among students of the University of Zambia. It was clear that fair and objective grading, detailed and timely feedback contributed to high Grade Point Average. The findings showed

that the above stated variables were statistically different. In addition, the findings showed that lecturers needed to have marking guides to help them mark objectively and fairly and that the assessment items ought to have covered a wide range of topics.

Implications, Conclusions, Recommendation

As a result of the findings in this study, the School of Medicine needs to work on areas which could raise the students' GPA and lower the examination attrition rates. This study used empirical findings to show that quality of teaching and learning could translate in students achieving the curriculum objectives and therefore achieving better scores in all assessments. The study, therefore, provided the determinants of attrition and academic success in the Medical School.

Lack of timely feedback and lack of helpful detail were seen as major contributing factors toward students' low GPA and high examination attrition rates. In courses where students' GPAs were low, most lecturers did not give timely feedback or never gave any feedback at all. In addition, lack of detailed guiding comments on the feedback did not help students to improve and do better in the other tasks. Assessing appropriate materials covered in the course in the final examination was another factor which affected students' academic performance. In courses where students were assessed based on stated learning objectives and instructional strategies, there was high GPA and low or no failure. In courses where assessments were misaligned with learning objectives, students either failed or got low marks resulting into low GPA. The courses where items brought in the examination were not covered in the lessons had high failure rates. Those courses which had their tasks cover all cognitive levels reduced the number of failures.

The study, therefore, recommends that assessment tasks should be aligned with learning objectives and feedback should be given to students on time and should be detailed.

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