Assessment and Evaluation Methods – The Prime Factors Influencing Curricular Outcomes

Jayashree Phadnis and Indu Pandit

VES College of Arts, Science and Commerce, Mumbai, India

j.phadnis@rediffmail.com

The rising expectations from higher education, educational research, and the emergence of quality initiatives in the field of higher education are bringing forth curricular reforms. Curriculum is not just about teaching but entails a complex process of the learning opportunities provided the methods of assessment employed and the resulting learning outcomes. A learner centric approach to curriculum redesign lays emphasis on learning outcomes. The learning outcomes imply knowledge, attitudes and skills that are assessable, transferable and relevant to their lives which will empower them to face competition and challenges of rapidly changing external environment. Embedding competence and capability building as a part of curriculum necessitates assessment and evaluation methods being intertwined with teaching rather than being a bolt–on approach separated in the form of a summative assessment. Examination reforms are the need of the hour to make education relevant and meaningful, and thereby satisfactory for all the stakeholders- employers, parents, students and the society at large.

Keywords: Curriculum redesign, Examination reforms

Changing Approaches to Assessment and Evaluation Globally

Educational research portrays the role of assessment methods, their impact on the quality of learning, and the emergence of innovative methods of evaluation. Studies of the relationship between university students' metacognition and their performance have demonstrated the existence of a relationship between differences in quality of learning (Conceptions of learning, approaches, and orientation) and differences in outcomes (Romainville, 1994.)

Several innovative methods of assessment have been reported with descriptions of the improved quality of learning in terms of outcomes. Hay and Thomas (1999) have demonstrated the use of poster presentations as a means of communicating the results of scientific investigation quickly and effectively. Choe and Drennan (2001) describe the jigsaw group activity for analyzing scientific literature. The emphasis was on cooperative learning thus involving active student participation. Elaborate descriptions of developing portfolios for learning and assessment are compiled (Klenowski, 2002). Novak (2002) has described the use of concept mapping as a effective tool for meaningful learning, which helps in constructing knowledge as well as in its assessment.

There is a growing evidence of educational institutions bringing about examination reforms. In fact curricula are designed with a focus on desired outcomes, which are inclusive of transferable/employable skills. Page (2003) describes the new Capability Curriculum at University of North London giving an account of how the university identified a set of six generic capabilities and introduced them into the curricula. Assessment strategies were evolved which assess the development of these key skills.

The Indian Context

Though having a glorious educational heritage, the current Indian educational system is riddled with several lacunae. The bulky affiliated system has led to mismanagement and maladministration, which seriously affected the quality of higher education. The scope for innovations shrank due to the need of a stereotypic functioning required to manage the vast numbers.

Examination reforms are genuinely required to make learning meaningful and relevant. With the legislation of entry of foreign universities around the corner, upgradation and improvement in the quality of education is imperative. On one hand we address the issue of brain drain but on the other hand we are not coming up with a solution to offer curricula which will have recognition by the stakeholders.

With the growing expectations about the outcomes of higher education, it becomes imperative to introspect on the perceptions of students and the teachers about the prevailing examination system and the related outcomes in terms of academic achievements and personal skills acquired by students. With a concern for these aspects, we undertook a systematic study of evaluation of curriculum.

This methodological study was conducted to critically evaluate the implementation of microbiology curriculum offered in colleges affiliated to University of Mumbai with relevance to industry requirement. A systems approach was adopted to understand curriculum transaction from the point of view of students, teachers and industry. In this context, the perceptions of students and teachers pertaining to examination, approaches to studying and the resulting achievements are examined, as examinations form a crucial component of the curriculum influencing the quality of learning.

Research Method

The approach adopted for the study is Illuminative Evaluation which falls within the purview of systems approach. In the present study, a descriptive survey method i.e. a cross sectional survey method was selected to study the population at a single point in time.

Tool used for the study

Keeping in view the nature of the study, following tools were prepared for collecting data: (i) Questionnaire for students (ii) Questionnaire for teachers

The tools were constructed through a series of modifications by administering the questionnaires to students and teachers respectively, In case of both the groups, the purpose was explained followed by discussion on their responses, which contributed towards developing the questionnaire. This was followed by the pre-pilot study and pilot study which finalized the tool for the study.

The content validity of the tools

The content validity of the students' questionnaire was established by studying student responses as well as by submitting the same to nine experts from the field of education. The content validity of the teachers' questionnaire was established by studying teacher responses as well as by submitting the same to nine experts from the field of education.

Reliability of the tools

The tool comprised of several questions having a rated scale. The responses were analyzed by the computer using SPSS Windows version 11.5, the reliability was established by determining Cronbach's alpha. The internal consistency coefficient was calculated as the indicator of reliability of responses question-wise for the students' questionnaire and the faculty questionnaire.

Analysis of data

Scoring pattern for the tools used in the study

The question types in the students' questionnaire and teachers' questionnaire include a three-point, four-point, and five-point rating scale, wherein respondents are directed to select the response category that best represents their reaction to the statement. To score the scale, the response categories are weighted. For favourable or positively stated statements, the maximum numeric value of the scale is assigned to the response category beginning at the favourable end. For unfavourable or negatively stated items the weighting is reversed. Further in this context, the researcher has used reverse scoring for statements indicating surface-learning, exam-oriented approach. Weighted Arithmetic means are computed using the formula given below:

$$\chi = \Sigma XW / \Sigma X$$

Where χ represents the weighted arithmetic mean, X represents the number of respondents, and W represents the weight assigned.

Description of the sample

All twenty-one colleges from the Mumbai, Thane and Raigad region affiliated to University of Mumbai and offering six units *microbiology* at the undergraduate level were selected ensuring a complete "representativeness" during sample selection and eliminating bias of any sort.

1. Selection of the students

An incidental sample of all third year under graduate students present in the class on the occasion while administering the tool was selected for the study. The sample comprised of 565 students, with 123 being male students and 442 being female students.

2. Selection of the faculty members

Faculty members appointed on a full time basis, on a regular pay scale were selected for the study. The sample comprised of 101 teachers, with 19 male teachers, and 82 being female teachers.

At the level of students

To understand student's perceptions, student data was categorized as follows:

— Students' perception about, the examination system, their approaches to learning and sources of acquiring knowledge

Objective 1: To study the scope provided by the current examination system to acquire diverse skills

Therefore, the examination system does not address the attainment of mastery goals/employable skills; and the students have a poor overall perception of the scope provided by the examination system to acquire diverse skills,

Objective 2: To study the sources of acquiring knowledge of microbiology adopted by the students

This reflects the emphasis on conventional sources of knowledge that is teachers, textbooks and reference books, and lesser utility of other sources used by students. Probably this may be due to emphasis on exam-oriented learning and lack of active learning activities in the form of completion of projects assignments, etc. that necessitates the usage of diverse sources of knowledge. The findings show that curriculum transaction restricts the sources of acquiring knowledge.

Objective 3: To study the students' approach to study microbiology

Thus the students predominantly adopt the surface learning approach, which reflects on the teaching methods and examination system poorly. The approach is driven primarily by the need to score in exams and the nature of exams is such which rewards reproduction of knowledge, which could be achieved by memorization, or knowledge reproduced by drill and practice. The findings show that students do not adopt the deep learning approach to studies.

At the level of faculty

To understand the faculty perceptions, faculty data was categorized as follows:

— Faculty's perception about utility of examinations

These findings show the deficiencies of course design, with teaching and assessment to be separate entities, pushing students towards rote learning, with a minimal scope for development of mastery goals/ transferable skills. As seen from the findings, the nature of examinations highly influence students', and the approach adopted by them to study and the sources for acquiring knowledge adopted by students. Most teachers are aware about the lacunae in the present examination system, and the restricted student development with respect to preparing students for the world of work.

Recommendations

— Teaching and assessment should not be maintained as separate water tight compartments but need to be intertwined. The facilitative approach to teaching should be adopted, with enhanced student participation to promote development of knowledge and employable skills.

— Innovative assessment methods should be adopted thereby facilitating development and assessment of employable skills. There is a dire need to have radical examination reforms in order to have value addition to the educational outcomes. Summative evaluation is pushing students towards rote learning.

— Professional development of staff is essential, as no reforms originate nor are they sustained if they are mere top to bottom approach. There is a dearth of professional skills as teachers do not have any formal training making it essential to have enhancement in the scholarship of teaching.

	To very large extent		**Large extent**		**To some extent**		**To very little extent**		**Not at all**		**Total**	
Benefits	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Total	Mean
Providing opportunities for creative thinking	34	6	105	18.6	207	36.6	156	27.6	63	11.2	565	1.81
Improving communication skills	51	9	134	23.7	182	32.2	121	21.4	77	13.6	565	1.93
Enabling better understanding of topic	44	7.8	153	27.1	233	41.2	113	20	22	3.9	565	2.15
Promoting development of various skills	35	12	102	23.5	227	40.2	133	18.1	68	6.2	565	1.83
Providing scope to work in teams	77	13.6	177	31.3	194	34.3	86	15.2	31	5.5	565	2.32
Providing scope to work independently	77	13.6	194	34.3	188	33.3	82	14.5	24	4.2	565	2.39

Table 1: Scope provided by the current examination systems to acquire diverse skills

Objective 1: To study microbiology teachers' perception of the utility of the current examination system

Sources of knowledge	To very large		Large extent extent		To some		To very little extent		Not at all extent		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Total	Mean
Teachers	228	40.4	200	35.4	92	16.3	41	7.3	4	0.7	565	3.07
Textbooks	231	40.9	189	33.5	84	14.9	36	6.4	25	4.4	565	3
Reference books	206	26.5	195	34.5	119	21.1	42	7.4	3	0.5	565	2.99
Journal articles	65	11.5	120	21.2	178	31.5	118	20.9	84	14.9	565	1.94
Educational T.V. programs	84	14.9	112	19.8	196	34.7	115	20.4	58	10.3	565	2.09
Guest lectures	50	8.8	100	17.7	209	37	114	20.2	92	16.3	565	1.83
Departmental activities	60	10.6	161	28.5	193	34.2	104	18.4	47	8.3	565	2.15
Internet facility	127	22.5	147	26	135	23.9	87	15.4	69	12.2	565	2.31
Industrial exhibitions	88	15.6	112	19.8	138	24.4	106	18.8	121	21.4	565	1.89
Educational visits	112	19.8	143	25.3	152	26.9	85	15	73	12.9	565	2.24
Participation in microbiology conferences	48	8.5	103	18.2	143	25.3	101	17.9	170	30.1	565	1.57
Summer training projects	99	17.5	108	19.1	119	21.1	67	11.9	172	30.4	565	1.81

Table 2: Sources of acquiring knowledge used by the students

	Never		Rarely		Sometimes		Frequently		Always		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Total	Mean
Give importance to exam oriented studies rather than deeper/serious study	60	10.6	61	10.8	128	22.7	151	26.7	165	29.2	565	1.47
Acquire an in depth understanding of the topics covered	42	7.4	81	14.3	216	38.2	148	26.2	78	13.8	565	2.25
Verify correctness of conclusions presented with theories taught	58	10.3	122	21.6	203	35.9	123	21.8	59	10.4	565	2.01
Read related topics of the subjects not covered under the syllabus	90	15.9	152	26.9	202	35.8	89	15.8	32	6.7	565	1.68
Enjoy solving newer problems	89	15.8	132	23.4	196	34.7	100	17.7	48	8.5	565	1.8
Memorize contents to help you clear exams	37	6.5	70	12.4	130	23	143	25.3	185	32.7	565	1.35
Depend on notes given by the teacher	41	7.3	79	14	171	30.3	170	30.1	104	18.4	565	1.62
Prepare frequently asked questions rather than do reference work	50	8.8	115	20.4	160	28.3	147	26	93	16.5	565	1.79

Table 3: Study approach adopted by the microbiology students

Criteria	To very large extent		Large extent extent		To some		To very small extent		Not at all		Total	
	Freq	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**	**Total**	**Mean**
Providing scope for learning by doing	8	7.9	35	34.7	50	49.5	7	6.9	1	1	101	2.42
Providing scope for learning by discovery	2	2	6	5.9	21	20.8	42	41.6	30	29.7	101	1.09
Providing scope to students for feedback and improvement	4	4	15	14.9	43	42.6	26	25.7	13	12.9	101	1.71
Encourage thorough understanding of the subject	5	5	34	33.7	47	46.5	12	11.9	3	3	101	2.26

Table 4: Utility of the current examination system

References

Choe, S.W.T., & Drennan, P.M. (2001). Analyzing scientific literature using a jigsaw group activity, *Journal of College Science Teaching*, 30(5), 328-330.

Hay, I., & Thomas, S.M. (1999). Making sense with posters in biological science education, *Journal of Biological Education,* 33(4) 209-214.

Klenowski, V. (2002). Using portfolios for a range of purposes. In V. Klenowski (Ed.), *Developing portfolios for learning and assessment processes and principles"*, 1, 10-25. Routledge Falmer.

Novak, J.D. (2002). Meaningful learning: The essential factor for conceptual change in limited or inappropriate propositional hierarchies leading to empowerment of learners, *Science Education*, 86, 548-568.

Page, B. (2003). The new capability curriculum at the university of North London. In J. Stephenson & M. Yorke (Eds.), *The International Encyclopedia of Higher Education,* 8(4), 35-41. Crest Publishing House: New Delhi.

Romainville, M. (1994). Awareness of cognitive strategies: The relationship between university students' metacognition and their performance, *Studies in Higher education,* 19(3), 359-366.