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Blue printing in assessment of formative examinations of undergraduate medical students in pathology

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ABSTRACT

Context/background: Assessment drives learning. Written examinations are the most employed method for assessment of cognitive skills in medical education lacking uniformity and validation. The few disadvantages of essay questions are a smaller number of questions, limited sampling, unfair distribution of questions over topics and vague questions. Blueprinting overcomes these issues, increasing the validity of examinations. Blueprinting has been a content validity tool.

Aims and objectives: To describe the process of developing a blueprint for undergraduate formative examinations in pathology and to evaluate its effect as a tool to increase the content validity of assessment.

Methodology: In present study, last five years ASRAMS second year MBBS pathology formative assessment papers in pathology were evaluated for its content validity. Desired weightage to all the topics in pathology were given by the faculty of the pathology. The formative assessment papers were also evaluated for level of cognitive domain. Closed ended feedback from faculty and second MBBS students was taken and statistically evaluated.

Conclusions: Students were satisfied as blueprinting helped them to attempt examination better. The faculty who validated the blueprint felt that it helps in distribution of appropriate weightage and questions across the topics and blueprinting should be an integral part of assessment. Assessment should be aligned to learning objectives and blue printing improves content validity.

Keywords: *Assessment, blue printing, pathology.*

1. INTRODUCTION

The assessment drives learning.

Theory examinations are the most employed method for assessment of cognitive skills in medical education.

Research gap shows few disadvantages in theory examinations which are limited sampling, unfair distribution over topics and vague questions, smaller number of questions.

Blue printing overcomes these issues, increasing the validity of examinations.

Aims and objectives

To describe the process of developing a blueprint for undergraduate theory examinations in pathology

To evaluate its effect as a tool to increase the content validity of assessment.

The primary objective of the study is to examine the content validity and weightage given to different areas in the subject of pathology in second year formative written examination held by the pathology department over last five years.

The secondary objective of the study is to prepare a blueprint that can be used in the second year MBBS formative written examination in the subject of pathology.

2. MATERIALS AND METHODS

Study setting-The study was conducted in department of pathology, ASRAMS

Study design- A Cross-sectional study

Sample size- Perceptions of Ten pathology faculty, twenty-eight second year MBBS Students

Duration- Five years

This study is based on the analysis of second year MBBS pathology question papers of last five years from year 2020 to year 2024 for formative assessment held by department of pathology, ASRAMS.

Table 1: Blueprint for theory paper 1

TOPICS	Long essay (10M)	Short essay (5M)	Short answer (3M)	MCQs (1M)
Hematology	1			4
Inflammation and repair	1			4
Neoplasia		2		4
Cell injury and adaptations		1	1	5
Immunology		2	1	
Hemodynamic disorders		1	1	4
Genetics		1		
Diseases of infancy and childhood		1		
Clinical pathology			1	2
Enviromental and nutritional disorder			1	2
Total number of questions	2	8	5	25

Table 2: Blueprint for theory paper II

System/topic	Long essay	Short essay	Short answers	MCQ
Cardiovascular system	1			3
Respiratory system		**1**	1	4
Gastrointestinal		**2**		2
Renal	**1**			**2**
Hepatobiliary		**2**		**2**
Endocrine		**1**	1	**2**
Female reproductive , breast		**1**		**3**
Musculoskeletal soft tissue		**1**		**2**
CNS/PNS/eye			**1**	**2**
Male reproductive			**1**	**3**
Lymphoreticular			**1**	
Total	**2**	**8**	**5**	**25**

In the present study, last five years (2020 to 2024) second MBBS formative pathology papers will be evaluated for its content validity.

Desired weightage to all the topics in pathology will be given by faculty of the pathology.

Evaluation of formative assessment papers was done for the level of cognitive domain.

Close ended feedback from faculty and second MBBS students was taken and statistically evaluated.

3. RESULTS

The (71.4%) students and (34%) faculty felt that there was appropriate distribution of questions across topics

The (78.6%) students and (66.7%) faculty felt appropriate weightage given to topics of public health importance

The (71.4%) students and (78%) faculty felt aligned questions with learning objectives

The (71%) students and (55.5%) faculty felt examinations were fair

Data were presented in graphs, pie charts and bar charts with excel

Fig1: Faculty perception on blue printing

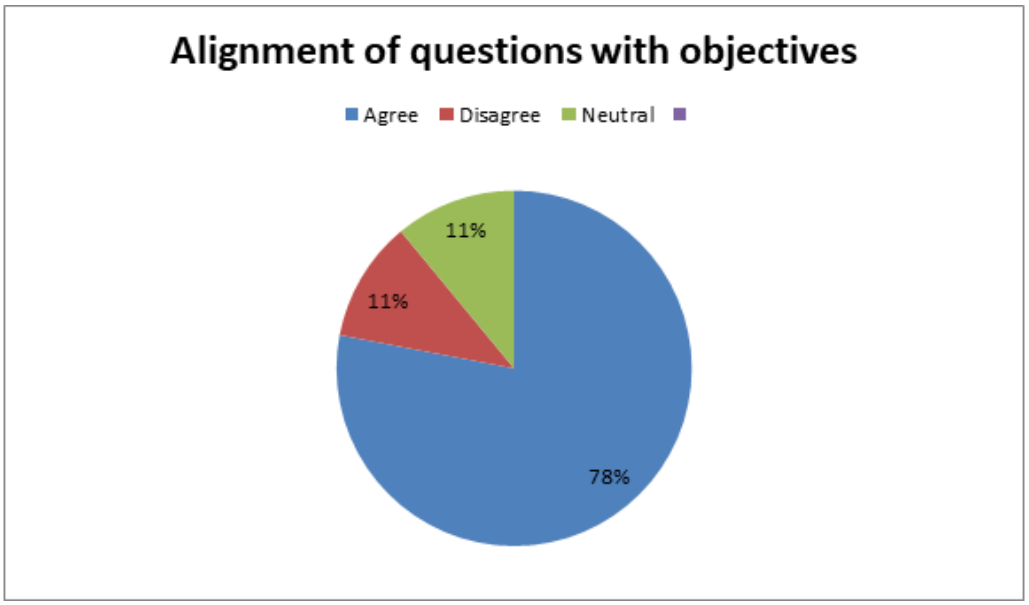
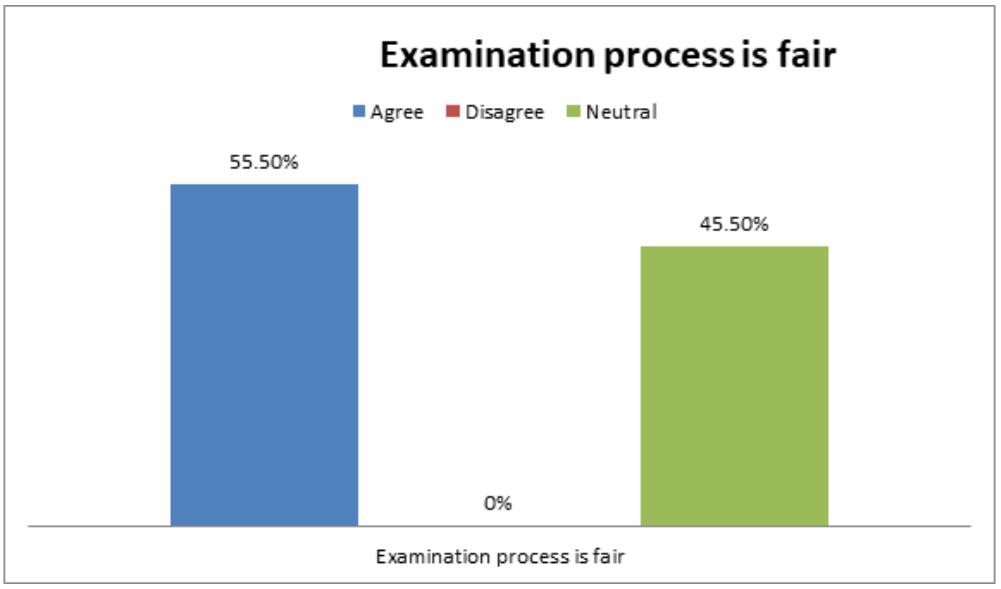


Fig 2: Faculty perception on blue printing



3.Faculty perception on blue printing

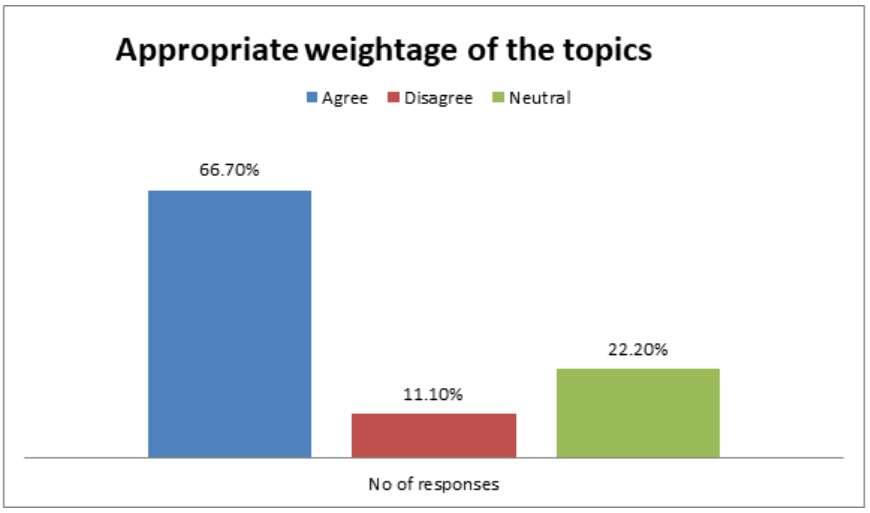


Fig 4: Perception of the faculty members regarding the feasibility of future implementation of CBME

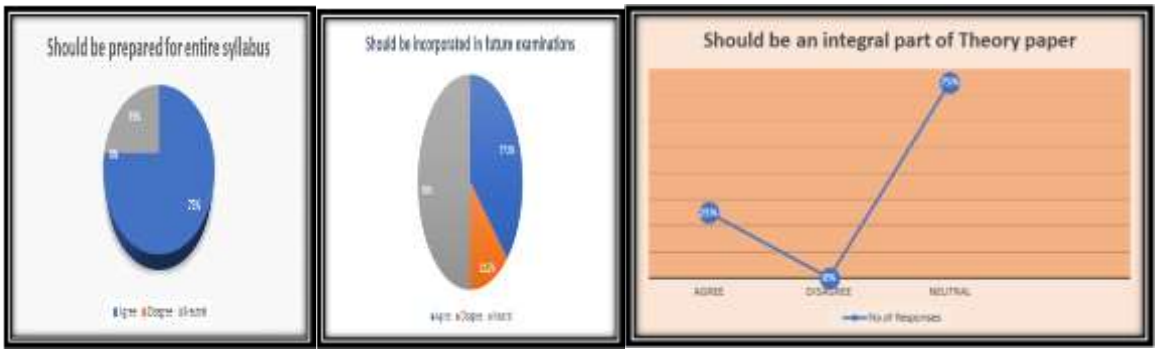
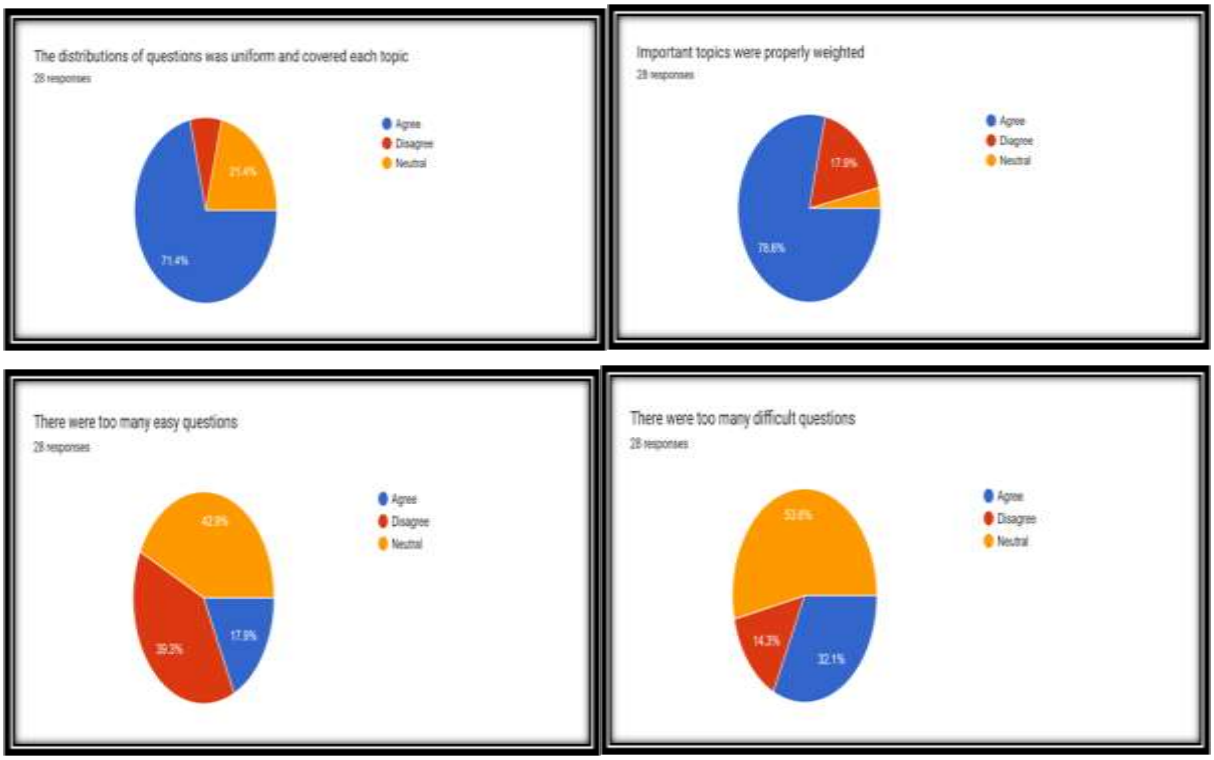
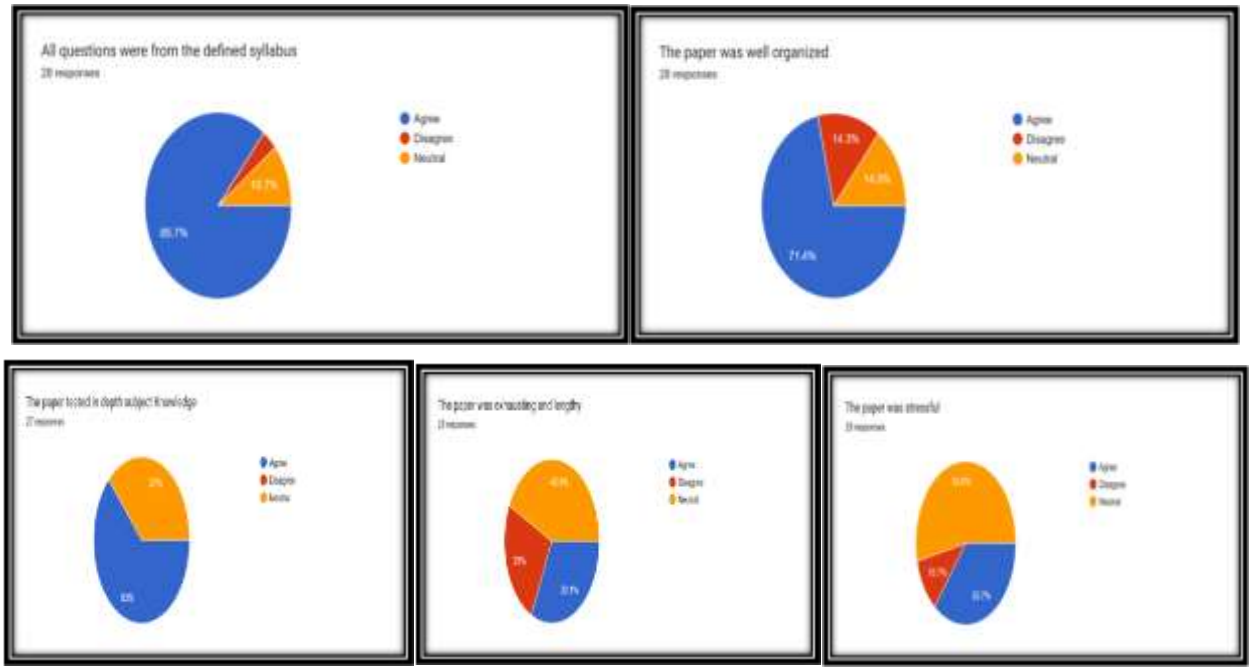


Figure 5- Students perception on blue printing





4. DISCUSSION

Assessment and evaluation are very important elements of teaching and learning.

For any assessment to be valid, it must have proper coverage of the topics of the curriculum.

While setting a paper, consistent representation of all topics as per their weightage can be ensured by blue printing.

The weightage of marks given to each content area with impact on public health importance and frequency of asking questions in accordance with the subjective consensus of the faculty of pathology department.

After creating a reliable blueprint, content validity of blueprint should be done when blueprint is used to guide course and evaluation.

A study by Patil SY et al, concluded that a well- constructed and reliable blueprint is a valuable educational tool to align objectives with assessment that includes all aspects of assessment.

In our study, paper setter's bias and affinity for some topics is observed. This lead to overrepresentation of many topics and underrepresentation of many other topics. This pattern leaves many topics underrepresented or unrepresented because of the use of the allotted marks in a limited number of questions. A study by Gill JS and Sen S also showed that there was over representation and underrepresentation of many topics across all the last five-year university papers in the subject of microbiology in the absence of blueprint.

A study by Bhandare NN and Bhandare PN also showed all subdivisions of pharmacology were not covered in theory assessments.

5. CONCLUSIONS

Assessment should be aligned to learning objectives and blue printing improves content validity. Blue printing should be an integral part of assessment

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