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CONSTRUCTION AND VALIDATION OF A STUDENTS' PERCEPTION TOOL (SPT) FOR THE ASSESSMENT OF PERCEPTIONS AMONG STUDENTS ABOUT THE QUALITY OF HIGHER EDUCATION

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Abstract:

This paper is an attempt to develop a valid and reliable tool to assess the students' perceptions about the quality of education in their institutes of higher learning. Firstly, there is a need to identify factors considered to be responsible for affecting the quality of prevailing educational practices in these institutions. This will help in gathering information about responsible factors of the subject through the validated tool. For the purpose, six educational dimensions were identified. These are curriculum design and planning, teaching-learning and evaluation, research development and extension, infrastructure and learning resources, organization and management, and student support services. Based upon these factors, 32 opinion statements based upon the Likert Scale were framed upon experts' advice. The tool was pre-piloted upon 100 students of two higher education institutions of Kasargod district in Kerala. After 't'-test, 26 items ($t > 1.75$) were included in the Student Perception Tool (SPT). The validated tool was even tested for its reliability using the Split Half method and Cronbach Alpha test. For both, the tests lower value was above the acceptable limit ($> .70$). During the study, it is analyzed that a tool is an aid for gathering most of the pieces of information related to the research. However, to make it the best aid, the researcher should have diversified knowledge related to the subject. Even the tool should have flexibility so that it can be used by the other disciplines of higher education also.

1.0. Introduction

The research tool is fundamental to every type of research. These researches can be ranging from natural sciences to social sciences. Tools so used in

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every research are different from each other and require knowledge of diversified fields of the researcher. This diversified knowledge is required to develop various tools to address various issues related to the subject (Bazerman, 2004). So, in social sciences, it is expected that the researcher should develop the tool as per the research subject to make the whole procedure more logical and valid (Kumar, 2011). Hence, tool selection/design is a very critical step of any research as its design contributes to formulating topic procedure and theoretical framework application to the original finding. Thus, the tool is never bound to any type of research. It depends upon the researchers' need to include and exclude factors from the perspectives of the research type, topic, and philosophical views.

Nowadays, most of the researches in social sciences are adopting a mixed approach in their findings. Tool designing of these kinds of researches can take in qualitative or quantitative or even mixed approaches. In today's complex territory of Social Sciences both the approaches overlap each other (Creswell, 2011). Quantitative is a closed approach, while qualitative is open-ended. The mixed approach brings together qualitative and quantitative, both the methods for data collection.

1.1. Factors affecting the quality of higher education

It is necessary to have a deep knowledge of factors responsible for affecting different variables of the research for effective tool development. In this piece of research, our main focus is upon verifying the prevailing quality aspect of higher education. Before proceeding further, it is necessary to understand the factors to be taken into account for tool construction concerning the present paper context. Education is required in the life of human being that is essential from childhood to the death of an individual. The role of primary education is to develop life's essential qualities among students. On the other hand, higher education develops skills in them which makes them employable. Higher education is a big competitive business that requires large scale investment (Skilbeck, 2001). Nevertheless, in today's rapidly changing world, there is a need for high flexibility in higher education. For which quality should be made an integral part of the tertiary education.

Every organization has three broad parts, i.e., input, process, and outcomes (Sanyal and Martin, 2007). In the globalization era, it is of utmost importance to bring changes in the three interconnected parts as per the market demand for a better outcome. Proper methodologies and evaluation measures should be adopted to assess the present status and desired outcome in an organization. In the context of higher education, its quality can be assessed by evaluating several parameters related to teaching, learning, and evaluation. The critical review based upon a theoretical framework to evaluate the quality of higher education can help us in bringing new changes in the current system.

Quality is a multi-dimensional identity, and it is difficult to define it in fixed terms. The definition of quality depends upon the type of institution, its goals, objectives, and involved stakeholders. Based on these factors, which change with time, should be flexible in nature (Mc Donald & Van Der Horst, 2007). Quality covers numerous factors connected to different stakeholders. So, it is very difficult

to put it into a definition of words (Sanyal and Martin, 2007). Here, every stakeholder from faculty members to the management should give their best efforts for a common vision, goals, and guidance. This is a kind of strategy for framing a plan and process towards quality attainment in an institution of higher learning (Deming, 2000).

The flexibility in the quality dimension encompasses the academic transformation. The change can be in the form of innovative pedagogies, technology-infused curricula, and assessment of these methods (McLean, 2006). The dimension should not only include the gateway to new pedagogies but should also open a new world through the function of research and extension. A sustainable world through qualitative organizational change and policies should be adopted (Sterling, 2004). Overall, students should be benefitted at the last for which it is necessary to respond to the student's needs and interests. There is a need to reform existing practices in higher education. The sector has diversified disciplines and the quality aspect of higher education covers the following areas of the education system:

- Curriculum design and planning
- Teaching-learning and evaluation
- Research development and extension
- Infrastructure and learning resources
- Organization and management
- Student support services

1.2. A brief discussion about reliability and validity

With reference to the above-discussed quality dimensions of higher education, there is a need of a reliable and valid tool to verify these dimensions effectively. It is essential to cover all the discussed six dimensions of quality in the desired research tool. This represents its validity.

The validity component of the tool tells us the accuracy of measuring the assigned work. Results by valid tools measure the results closely corresponding to the real-world values. Construct validity measures what its intended to measure? Content validity is fully representative of what a test aims to measure? Face validity shows whether the content of the test appear to be suitable to its aims? On the other hand, criterion validity verifies if the results correspond to a different test of the same thing (Middleton, 2019).

The desired research tool in the study should be of use if it is used in different institutions or disciplines. This shows the reliability of the tool. Reliability refers to the degree of accuracy of measuring instruments. A measuring instrument is reliable if it provides consistent results. For example, a weighting scale is reliable if it gives the same reading when the same object is weighed several times.

From the above discussion, we can say that a researcher should methodologically establish rigorous criteria regarding tools to be used in any research in order to guarantee observational consistency.

2.0. Framework

In view of the above-discussed dimensions, a research tool has been framed in consultation with the education experts in the area. The research tool has statements related to the six quality dimensions of higher education. The main focus of this tool is to assess the perception of students about the quality of education in their institute of higher learning. Students are considered to be the pivotal stakeholders of any education system. Students are the most important consumer of any education system. Their perception should be considered as one of the most prominent yardsticks for the measurement of quality attainment. The Student Perception Tool (SPT) has covered all the above discussed six dimensions. The main aim was to know about the truthness of existing quality practices and infrastructure in institutes of higher learning in Kerala through students' feedback.

2.1. Validation of the tool

The tool with 40 items was presented to a panel of experts, which included internal teacher educators, research scholars, and some external faculty members. These experts were from Alagappa University, Tamil Nadu; Government College of Teacher Education, Thiruvanthapuram; the Central University of Kerala, Kasargod, and Kerala State Higher Education Council, Thiruvanthapuram. Experts were requested for their comments and suggestions on appropriateness and the structure of items. On their suggestions, eight items were removed, and some of them were restructured and refined. Later, on scrutiny panel expressed satisfaction over the content of the tool. This measures the content validity of the research tool. Now, the SPT has a total of 32 items to be piloted before approaching the research sample.

2.2. Pilot study

The scrutinized tool was firstly administered on a sample of 100 students in two institutions of Kasargod district of Kerala. These students were pursuing general courses of higher education in Kerala. Initially, the researcher gave a verbal introduction to the tool to students. Further, it is requested to mark their responses in appropriate columns as per the given instructions. For the purpose, students were given 30 minutes to mark their responses.

2.3. Mode of answering

Five alternate responses were given for each item of the scale. The scale is based upon the famous Likert Scale and is widely used for opinion poll in all the areas. For each item, the responses and scores may vary. The responses are noted down as per the following ratings:

- Never-1, Rarely-2, Sometimes-3, Often-4, Always-5
- Strongly Disagree-1, Disagree-2, Neutral-3, Agree-4, Strongly Agree-5
- Very Poor-1, Poor-2, Average-3, Good-4, Excellent-5
- Very Dissatisfied-1, Dissatisfied-2, Neutral-3, Satisfied-4, Very Satisfied-5

2.4. Scoring of the items

After the collection of responses, the other step was the quantification of perception scores. The researcher has put up 'one' ('1') for extreme negative to 'five' ('5') for extreme positive responses. The total score of each respondent was calculated for each item, so that item analysis can easily be done successfully.

2.5. Item analysis and preparation of final items

Scores of all respondents were totaled, and on the basis of these scores, the responses were arranged in ascending order. The response scores of the first 27 respondents and the last 27 respondents were taken into account for calculating the mean scores of each item. The t-value for each item is calculated for final selection. The items having a significant difference in mean scores of upper and lower group ($t > 1.75$) is considered to be included for the final tool, according to Edward (1975). The 't' value obtained for each item in the perception tool is given in table 1.

Table1
t-value obtained for each item of student perception tool

Item	t-value	Item	t-value	Item	t-value	Item	t-value
1*	2.714	9*	2.635	17	1.034	25*	4.513
2*	2.343	10*	4.123	18*	3.204	26*	3.954
3	1.215	11*	4.031	19*	3.452	27*	1.952
4*	2.987	12*	3.037	20*	3.635	28*	4.149
5*	5.958	13*	3.339	21*	2.217	29	1.341
6	1.395	14	1.241	22*	2.051	30*	1.805
7*	2.850	15*	4.205	23*	3.159	31*	4.411
8*	4.064	16*	2.972	24*	2.018	32	.000

*indicates the items selected for the final tool

(Source: Calculated by the authors)

Item analysis indicated that 26 items meet the standard to be included in the final tool, which is shown in appendix 'A' at the end of this research paper.

3.0. Reliability

The reliability of the constructed tool was established through Split Half Method. Scores of 26 statements were divided into two equivalent halves to take all odd items in one-half section and even items in the second half. The reliability was calculated using the following formula, given by Spearman Brown (1910) and values for each item are shown in table 2.

$$R = \frac{2r_{1/2}}{1 + r_{1/2}}$$

Equation 1

Where, R = Reliability of the whole test

$r_{1/2}$ = coefficient of co-relation for the half test

Calculation of coefficient of co-relation for the half test is done as:

$$r_{1/2} = \frac{\sum xy}{\sqrt{X^2 + Y^2}}$$

Equation 2

Where, X^2 = Square of deviations from mean of even item scores
 Y^2 = Square of deviations from the mean of odd item scores
 xy = Product of even and odd item deviations from means

Cronbach Alpha (1951) was calculated using the following formula:

$$\alpha = \left(\frac{k}{k - 1} \right) * \left\{ \frac{1 - \sum S_i^2}{S_t^2} \right\}$$

Equation 3

Where, k = Number of items/ groups
 S_i = Standard deviation of i^{th} group (added both the groups)
 S_t = Standard deviation of sum score (all scores together)

Table 2
 Reliability value obtained for each item of student perception tool

Even Item	Odd Item	X	Y	$x=(X-Mx)$	$y=(Y-My)$	X^2	Y^2	xy
2	1	219	168	34	-21.0769	1156	444.237	-716.62
4	5	156	161	-29	-28.0769	841	788.314	814.231
8	7	215	212	30	22.92308	900	525.467	687.692
10	9	214	228	29	38.92308	841	1515.01	1128.77
12	11	141	162	-44	-27.0769	1936	733.16	1191.38
16	13	152	138	-33	-51.0769	1089	2608.85	1685.54
18	15	210	217	25	27.92308	625	779.698	698.077
20	19	182	211	-3	21.92308	9	480.621	-65.769
22	21	196	231	11	41.92308	121	1757.54	461.154
24	23	162	168	-23	-21.0769	529	444.237	484.769
26	25	191	151	6	-38.0769	36	1449.85	-228.46
28	27	186	220	1	30.92308	1	956.237	30.9231
30	31	181	191	-4	1.923077	16	3.69822	-7.6923
		2405	2458			8100	12486.9	6164

(Source: Calculated by the authors)

Using Equation (1) and (2) above formulae it is calculated that:

$$r_{1/2} = 0.612; \text{ and } R = 0.76$$

The reliability value of Split Half Coefficient was found to be 0.76 and Cronbach's Alpha was 0.75. Hence, the constructed tool was found to have acceptable measures of reliability (A copy of the tool before and after item analysis is appended in as *Appendix A*).

4.0. Conclusion

Present work is about the development of a tool to assess the quality of education in the institutions of higher learning. Further, it tells us about the importance of the research tool in gathering information for any research. The construction and validation of every tool is the most challenging job of every researcher. In SPT, six dimensions of higher education are included for quality assessment. These are curriculum design and planning, teaching-learning and evaluation, research development and extension, infrastructure and learning resources, organization and management, and student support services. As students are one of the major stakeholders in an education system, their feedback is most important in this regard. SPT is in the form of a rating scale. Initially, the scale has 45 statements with five levels of opinion expression regarding quality aspects in institutions of higher learning. These 45 statements were sorted out to 32 on experts' advice. The drafted tool was pre-piloted upon a sample belonging to two higher education institutions in Kasargod district of Kerala. The two institutions were in rural and urban area of Kasargod. The pre-piloting of the SPT was performed on 100 students from these two institutions. The sample should have the characteristics of the population to have genuine validity. The responses of 100 students were quantified. Based on these quantified scores, all items were validated using Edward's *t*-test. Finally six statements were dropped. Now, SPT has 26 statements to assess the students' perceptions about the quality of higher education. The reliability was checked using Spearman Brown and Cronbach Alpha test, which is found to be within acceptable limits.

Through this study, we can conclude that the development of a research tool is an important step in every research. The foremost important point in this regard is to establish the acceptable validity of the tool. The researcher should have diversified knowledge concerning the research topic. Every factor responsible for affecting the subject should be included in the study. The flexibility of the tool, so that it can be applied in other disciplines of higher education also, shows its reliability. Overall, it depends upon the knowledge of the researcher about his area of research so that every aspect could be covered without any biased attitude.

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Appendix A
Student Perception Tool (SPT)

Name of the investigator: Himanshu Tripathi
Name of the Supervisor: Dr. J.E. Merlin Sasikala

Kindly read the informations very carefully and mark the right response with tick mark. The details are going to be kept confidential and used just for research purposes.

As per your opinion, kindly rate the statements as follows:

Rating Scale Never-1, Rarely-2, Sometimes-3, Often-4, Always-5
 Strongly Disagree-1, Disagree-2, Neutral-3, Agree-4, Strongly Agree-5
 Very Poor-1, Poor-2, Average-3, Good-4, Excellent-5
 Very Disatisfied-1, Dis-satisfied-2, Neutral-3, Satisfied-4, Very Satisfied-5

Sl No.	Statements	Score				
		1	2	3	4	5
1.	Are you satisfied with the duration of the programme?					
2.	How much your university took interest in incorporating emerging concerns in the curriculum (curriculum revision and periodicity)?					
3.	Are you satisfied with the allocation time for transaction of theory?					
4.	How often are you involved in formal feedback mechanism related to curriculum?					

5.	How much your teacher is unbiased while teaching irrespective of caste, gender and religion (participatory and interactive approach)?					
6.	How often your teacher follows the interconnectedness approach with other subjects?					
7.	How often your teacher uses technology while teaching?					
8.	How would you rate your teacher regarding content knowledge?					
9.	How much the assessment process is employed for improving the skills and enhancing competence?					
10.	How much are you satisfied with the fairness and transparency in the evaluation process?					
11.	How often your institution applies technology to facilitate a variety of assessment and evaluation?					
12.	How much your institution is motivating you to pursue research activities?					
13.	How much you are satisfied with the laboratories in your college?					
14.	How much you are satisfied with the library services in your college?					
15.	How much you are satisfied with the playground and sports related activities services in your college?					
16.	How often your college is conducting co-curricular activities in a year?					
17.	How often your institution shows concern for placement?					
18.	How much you are satisfied with the well structured organized, proactive guidance and counseling unit?					
19.	How do you rate the notification services by your institution regarding wide publicity for admission?					
20.	How do you rate the access to current information about current programme and procedure in the institution?					
21.	How much your institution exhibits gender sensitivity?					
22.	How much you are satisfied with the fee structure for the programme with least unexpected add-on expenditure?					
23.	How much you are satisfied with the scholarship services provided to you by the University?					
24.	How often organization is conducting Alumni meet?					
25.	How much you are satisfied by the bus services in your institute?					
26.	Do you have separate girls' waiting room and how much you are satisfied by the resources within the room?					