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CONSTRUCTION OF CLASSROOM CLIMATE 3D SCALE

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ABSTRACT

Tool is an essential thing and it plays a vital role in educational researches. A trait cannot be measured without appropriate tool. A tool in researcher's hand is look like a professional having a tool to work. In social sciences, the tools may be in a form of questionnaire, rating scales, inventories, batteries etc. A good tool should posses a valid statements and they are judges the accuracy of the measures. Generally, the classroom environment plays a vital role in teaching- learning process and it may be a one of an obstacle in teaching-learning process. The bad environment pushes the teaching as well as learning to unfruitful. The teacher or the head authorities may analyze the classroom climate for enhancing effective teaching-learning process. The individual analysis or measures are not in true manner because of the subjectivity of an individual dominates the measures. There is a way to reduce subjectivity and produce precise analysis or measurement is that the measuring traits must be measured in all views that is three dimensional views. So, the authors of this paper constructed a Classroom Climate 3D Scale for measuring the precise status of the classroom climate without the subject bias.

KEYWORDS: *Classroom Climate, Teaching Support, Physical Arrangements, Item Analysis, Resources*

1.1 INTRODUCTION

In any level of school, the classroom environment should be in real manner. The teaching and learning process mostly, terminated by the learning environment of classroom climate of the school. If the school have good classroom climate, the teacher will teaching interestedly and the student learns with good attraction. According to Praveena and Srinivastava (2012), explained the factors which are affecting learning. It is classified into two such as internal and external factor. The external factor especially the learning environment affecting the students learning. Then, the author quoted the sentence to emphasize the learning environment that "proper ventilation, noiseless surroundings, seating arrangements, availability of professional teacher, teacher – student relationship, etc., greatly influences the process of learning". The statement insisted, the learning and achievement of the learner is depends on learning environment. If the teacher have higher emotional influence, the students mental health may be maintained a long time and make if positive effect or academic performance.

Tools are very essential instrument to measure or assess or evaluate any type of variables. According to Best and kahn (1998), "Research tool is the means for describing and quantifying the data collected by the investigator many different methods and procedures have been developed to aid in the distinctive ways of describing and quantifying data". In social sciences, the researchers should pay a great attention in tools which may be constructed or it available in readymade mode. The precise

in measurement is directly depends on objectivity of the measuring tool. The construction procedure of the classroom climate 3D scale is explained in succeeding paragraphs.

1.2 ORIGINATION WITH BACKGROUND OF DIMENSIONS FOR CLASSROOM CLIMATE 3D SCALE

Based on the available definition, the classroom climate definition has been derived and it yields the dimensions. The following dimensions are used to develop the dimensions of classroom climate.

Class climate as encompassing all the socio-psychological dimensions of classroom life (Wang, Haertel & Walberg, 1993).

The physical arrangement of the classroom furniture, the availability of the resource materials and length of the class period (Chapin & Eastman, 1996).

In addition to,

The type and pace of instruction (Wang et al., 1993).

Including classroom management and inter personal relationship (Gottfredson & Gottfredson, 1989).

Amborse *et. al.* (2010) define classroom climate as "the intellectual, social, emotional, and physical environments in which our students learn. Climate is determined by a constellation of interacting factors that include faculty-student interaction, the tone instructors set, instances of stereotyping or tokenism, the course demographics (for example, relative size of racial and other social groups enrolled in the course), student-student interaction, and the range of perspectives represented in the course content and materials"

A classroom climate is the combination of variables within a classroom that work together to promote learning in a comfortable environment. There are many different variables that influence a classroom's climate, which is why every classroom is unique. There are certain elements, however, that are required to establish a successful learning environment (http://www.ehow.com/info_7747736_definition-classroom-climate.html)

Classroom environment encompasses a broad range of educational concepts, including the physical setting, the psychological environment created through social contexts, and numerous instructional components related to teacher characteristics and behaviors (http://www.education.com/reference/article/classroom-environment/#B)

A classroom climate is the combination of variables with in a classroom that work together to promote learning in a comfortable environment. There are many different variables that influence the classroom climate (http://mmselsectionb.wordpress.com/2011/12/06/the-definition-of-a-classroom-climate-article-group-3-week-11/).

With the well understanding of the meaning classroom climate from above definitions, the authors of this paper have defined the classroom climate as "Classroom climate means the intellectual, social, emotional, and physical environments in which the students learn". With the help of this definition some useful dimensions were yield for developing items for measuring classroom climate. The following paragraphs give an outline about the dimensions of classroom climate 3D scale.

1.3 CONCEPTION OF DIMENSIONS OF CLASSROOM CLIMATE 3D SCALE

By scrutinizing the definitions, the following factors were picked out by its importance and it yields the dimensions. The authors of this paper described all dimensions for measuring classroom climate status precisely. For this purpose, the dimensions have been described as follows.

- *Teaching Support:* The teaching support is explained from the integrated activities of a teacher. The teaching support includes the teacher activities such as showing interest in students learning, giving opportunity to express opinions, help students to do their work, teaching on students' understanding level and use new techniques in teaching.
- *Learners/Students Autonomy:* Learner/ students autonomy also called as freedom of students. It is a situation in which the learners are responsible for all decision concerns. It emphasizes freedom to learning, supports, and desirable psychological and physiological activities of the learners.
- *Learners/Students Interaction:* Learners' interaction is the positive participation of learners during teaching-learning process such as asking clarification, queries and answering.
- *Inter-Personal Relationship:* Inter-personal relationship occurs between the teacher and the learners in the classroom those are who fill each other's explicit or implicit, physical or emotional needs in some way.
- *Classroom Management:* Classroom management normally refers to the teacher how they use human and other resources in teaching-

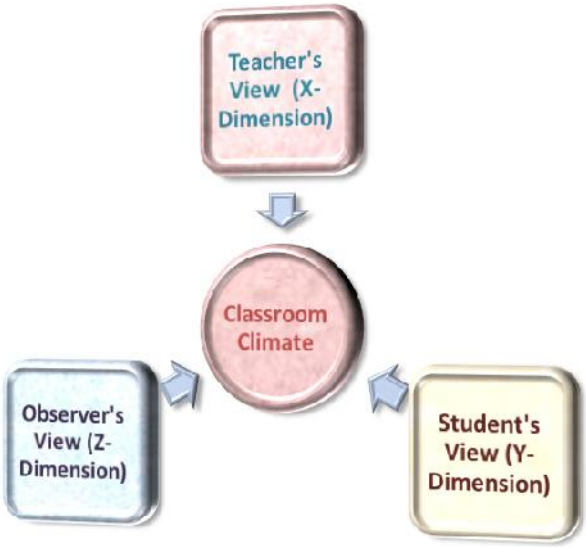
learning process. It explains the skills of the teacher to keep students organized orderly, focused, attentive on task and academic productive during teaching.

- *Physical Arrangements:* Physical arrangements in classroom also called as decoration of the classroom. The decoration shows the teaching aids (visual cards, posters and charts etc.,) and arrangement of amenities.
- *Availability of Resources:* Resources are basics in all activities. It may be a text books, audio and video materials, software and hardware, and other materials that are used to teaching-learning process.
- *Individual Satisfaction:* Individual satisfaction means the happiness and pleased feelings on the result of something which can be done by an individual or that can be happen to the individual.

1.4 CONSTRUCTION OF CLASSROOM CLIMATE 3D SCALE

Reducing measuring bias and accuracy in measurement, the classroom climate scale has been constructed in three dimensional forms (3D). It consisted with three different sub-scales such as Teacher's (X-Dimension), Student's (Y-Dimension) and Observer's Views (Z-Dimension) of classroom climate 3D scale. Figure 1 shows the pictorial form of classroom climate 3D view.

Figure 1.1 Classroom Climate 3D Scale



The following procedures have been followed by the authors for construct the classroom climate 3D scale.

1.4.1 Development of the Items:-

Effectiveness of the items is directly depends upon the reflection of the measuring variables. For enhancing effectiveness, Item writing must be relevant to the dimensions and wholly reflects the measuring variables. Dimensions are the base to produce a valid statement. For identifying dimensions, the investigator proposed an operational definition for classroom climate and it has been defined with purposefully identified numbers of definitions. From the operational definition, the dimensions has been derived and defined. They are Teaching Support, Learners/Students Autonomy, Learners/Students Interaction, Inter-Personal Relationship, Classroom Management, Physical Arrangements, Availability of Resources and Individual Satisfaction. Generally, no one can measure a trait 100% psychologically in social sciences. Because the respondents' subjectivity automatically presents while responding and it affects the truthfulness and validity of the measurement. For reducing measurement bias, the tool has been developed in three dimensional views such as teacher's view, student's view and observer's view. At very first, the teacher's view scale was constructed with dichotomy responses (Yes or No) and it is coming under the nominal scale. In each dimensions having a number of items and they are reflecting the definition's meaning of its dimensions. After finalizing the teacher's view scale, the other two scales (student's view and observer's view) have been prepared with the same meaning of the items but modification of subjects (first person, second person and third person) and it is subjected to standardization process. The description of the items is given in the table 1.1.

Table 1.1 Item Description of Classroom Climate 3D Scale

S.No	Dimensions	No. of Items	No. of Positive Items	No. of Negative Items
1.	Teaching Support	11	6	5
2.	Learners/Students Autonomy	7	3	4
3.	Learners/Students Interaction	10	4	6
4.	Inter-Personal Relationship	11	7	4
5.	Classroom Management	9	6	3
6.	Physical Arrangements	11	7	4
7.	Availability of Resources	6	2	4
8.	Individual Satisfaction	6	5	1
Total		**71**	**40**	**31**

1.4.2 Expert Opinion:-

The classroom climate 3D scale was sent a the panel of subject experts which includes one Associate professor, two Assistant professors and one higher secondary school teacher excluding the research supervisor. With the guidelines of subject experts, the suggestive things were made in all sub scales of classroom climate 3D scale and they are subjected to item analysis.

1.4.3 Item Analysis:-

The tool was constructed with dichotomy responses that are yes or no questions. The preliminary survey was conducted with random sample of 507 first year students for item analysis, 121 teachers of higher secondary school. Each was observed (quantitative observation) by the investigator for Z-dimension. Scaling type is very essential to adapt exact item analysis method. If the questions of the questionnaire has dichotomy responses or be a nominal scale, the χ^2 test must be adopted for item analysis by the researcher. The questions of the classroom climate 3D scale have dichotomy responses. So the investigator has used χ^2 test for item analysis with equal probability hypothesis. The following χ^2 formula was used to item selection.

$$\chi 2 = \Sigma\left(\frac{(O-E)^2}{E}\right)$$

Where,

O – Observed Frequency

E – Expected Frequency

Selection of items, the equal probability hypothesis was formulated that there is no significant difference in frequencies of Yes and No answered individuals. The items were selected with the value of 3.841 with the degrees of freedom 1 at 0.05 levels. For item selection of classroom climate 3D scale, the all three sub-scales are considered too. So, the items only were retained which are posses the critical value and its lesser value in all dimensions. The list of Retained and Rejected items with χ^2 values in all dimensions are given in the table 1.2.

Table 1.2 Status of Item on the basis of χ^2 values

Item No.	χ^2 values			Item Status	New Item No.
	X-Dimension	Y-Dimension	Z-Dimension		
1	**0.073**	28.878	**0.097**	Rejected	-
2	**0.073**	**0.160**	**0.11**	**Retained**	1
3	**2.350**	87.813	**0.269**	Rejected	-
4	**3.585**	**3.647**	**3.108**	**Retained**	2
5	**0.073**	**3.316**	**0.871**	**Retained**	3
6	**3.585**	84.515	**0.527**	Rejected	-
7	**0.984**	**3.000**	**0.097**	**Retained**	4
8	**1.374**	**1.233**	**0.527**	**Retained**	5
9	**1.374**	**2.148**	**0.269**	**Retained**	6
10	**0.659**	**0.097**	**0.871**	**Retained**	7
11	**1.827**	**3.000**	**1.301**	**Retained**	8
12	64.398	52.404	54.204	Rejected	-
13	13.667	**1.438**	13.172	Rejected	-
14	**1.374**	**0.444**	**1.301**	**Retained**	9
15	64.398	130.274	40.011	Rejected	-
16	**0.073**	**0.870**	**0.097**	**Retained**	10
17	**0.203**	**0.049**	**0.269**	**Retained**	11
18	**0.073**	**1.233**	**0.097**	**Retained**	12
19	119.033	181.083	123.31	Rejected	-
20	**0.398**	**3.647**	**0.269**	**Retained**	13
21	**3.585**	**0.160**	**0.871**	**Retained**	14
22	17.959	**1.659**	19.882	Rejected	-
23	**1.374**	**3.647**	**0.527**	**Retained**	15
24	**0.203**	3.994	**0.011**	Rejected	-
25	**0.398**	**1.438**	**1.817**	**Retained**	16
26	**0.398**	**0.712**	**0.011**	**Retained**	17
27	58.740	28.878	45.430	Rejected	-
28	48.203	24.302	48.269	Rejected	-
29	**0.984**	**0.712**	**0.011**	**Retained**	18
30	**2.350**	**0.160**	**3.108**	**Retained**	19
31	**0.008**	**1.895**	**0.269**	**Retained**	20
32	38.707	128.254	27.968	Rejected	-
33	**0.008**	**3.647**	**1.301**	**Retained**	21
34	**0.659**	**0.097**	**2.419**	**Retained**	22
35	**0.984**	**2.700**	**0.011**	**Retained**	23
36	**2.350**	**2.416**	**0.871**	**Retained**	24
37	**0.984**	**1.233**	3.882	Rejected	-
38	**2.350**	**1.438**	**1.301**	**Retained**	25
39	86.252	99.852	67.108	Rejected	-
40	4.301	**0.239**	**1.817**	Rejected	-
41	**0.659**	**0.097**	**0.527**	**Retained**	26
42	**2.935**	**2.416**	**2.419**	**Retained**	27
43	**0.008**	**0.333**	**0.11**	**Retained**	28
44	7.813	3.994	4.742	Rejected	-
45	**0.984**	**1.895**	**1.301**	**Retained**	29
46	24.593	8.333	14.720	Rejected	-
47	70.317	**0.002**	**0.011**	Rejected	-
48	**3.585**	**3.000**	4.742	Rejected	-
49	**0.398**	**0.018**	**1.817**	**Retained**	30
50	**1.829**	**0.870**	**1.817**	**Retained**	31
51	**0.203**	**3.316**	**0.97**	**Retained**	32
52	**0.398**	**0.712**	**0.527**	**Retained**	33

53	**2.350**	**1.233**	**1.301**	**Retained**	34
54	**3.585**	8.333	**1.301**	Rejected	-
55	17.959	39.213	19.882	Rejected	-
56	**1.374**	**0.160**	**0.527**	**Retained**	35
57	**0.398**	**0.002**	**0.011**	**Retained**	36
58	93.081	**0.160**	63.753	Rejected	-
59	**0.659**	**1.438**	**0.011**	**Retained**	37
60	**0.73**	**0.870**	**0.097**	**Retained**	38
61	**0.73**	**1.233**	**0.011**	**Retained**	39
62	4.301	59.032	**6.720**	Rejected	-
63	13.667	8.854	16.355	Rejected	-
64	32.268	53.698	34.935	Rejected	-
65	**1.374**	**2.416**	**0.097**	**Retained**	40
66	58.740	64.617	57.301	Rejected	-
67	34.350	57.675	27.968	Rejected	-
68	24.593	5.966	14.720	Rejected	-
69	**1.374**	**0.570**	**1.817**	**Retained**	41
70	**0.984**	**2.148**	**0.097**	**Retained**	42
71	**1.829**	21.746	**0.269**	Rejected	-

1.4.4 Final Draft:-

Based on item analysis, the 42 items were retained for final draft of the tool. The description of the final draft is given in table 1.3.

Table 1. 3 Item description of Final Draft

S.No	Dimensions	No. of Positive Items	No. of Negative Items	Total No. of Items
1.	Teaching Support	4	2	6
2.	Learners/Students Autonomy	2	5	7
3.	Learners/Students Interaction	1	6	7
4.	Inter-Personal Relationship	3	1	4
5.	Classroom Management	2	1	3
6.	Physical Arrangements	5	3	8
7.	Availability of Resources	1	2	3
8.	Individual Satisfaction	3	1	4
Total		21	21	42

1.5 CONCLUSION

The classroom climate 3D scale has been constructed with forty two items and each item was prepared with three dimensional views. The scale will be more useful to measure the classroom climate with unbiased of subjects.

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