

Construction of School Climate Measurement Instruments among Students

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ABSTRACT:- The present study aims to describe the school climate in the educational context, analyze the construct validity and reliability of the school climate, and identify indicators that shape the school climate. School climate is measured upon aspects of engagement, empowerment and autonomy, inclusivity and equity and the environment. Analysis in this study involve the use of Smart PLS 3.0 program with reflective 2nd Order CFA. Data were collected online from 60 teenage students using Google form. The results show that the item statements were valid and reliable. The school climate presents exceptional validity and construct condition.

Keywords: School climate, engagement, empowerment and autonomy, inclusivity and equity and environment.

I. INTRODUCTION

School is an environment where students are able to build relationships and learn how to interact with others. A good school climate will lead to prosocial education and improve student achievement in learning (Lee & Wong, 2009). The school is a place of learning for students to be a part of the community that encompasses the transfer of important values, such as adhering to the social norms, improving academics, uniting parents, teachers, students and others in a shared commitment to achieve common goals and implementing life values (McGrath & Nobel, 2010; Smith, 2010). Being a student, as a stage in life, plays a central role in people's lives where during adolescence, individuals work together within the school environment creating mutual belonging between students that manifests as motivation, attitudes, and behaviors which are linked to success in school (Vieno, Perkins, Smith, & Santinello (2005).

School climate with respect to students can help improve interpersonal relationships and optimize learning opportunities. A demographic environment can increase levels of achievement and reduce maladaptive behaviors (McEvoy & Welker, 2000). Schools that have a positive school climate usually experience fewer behavioral and emotional problems (Marshall, M. L. 2004). A positive school climate can increase job satisfaction for the people within the school (Marshall, M. L. 2004). A positive school climate can produce positive education and improve the psychological conditions of students, teachers, and administrators, etc. (Kuperminc, Leadbeater & Blatt, 2001). Classrooms and school culture play a role in shaping student experiences wherein good interactions are the key to developing a sense of community between students (Furman, 2002).

The negative impact that a certain school climate can have for students is that students often commit crime and violence in schools (Schwartz, Gorman, Nakamoto, McKay, 2006). A negative school climate can also lead to experiences of academic failures (McEvoy, & Welker, 2000). In practice, achievement gap exists between students as a consequence of their socioeconomic status. (McEvoy, & Welker, 2000). The right school climate can have appositive impact by improving students' achievements and helping students to have positive attitudes towards school and school subjects which will lead to optimal learning as well as academic success

(Marshall, M. L. 2004). Students are also able to increase their knowledge and academic success in addition to having a positive personal growth (Manning and Saddlemire, 1996).

Teachers have an important role in constructing comfort over the school environment as well as setting achievements within the school. Teachers who have good commitment will create a strong psychological bond with the school and this commitment should be come from within themselves. This commitment is projected through a number of manners or parameters, such as ways of teaching, student achievement, and a well-developed school organization (Alfassi, 2004; Smith, 2010). Schools can be effective when there are committed teachers thereby creating positive school climate (Peterson & Skiba, 2001). A good school climate is supported by the culture that exists in the school. A positive school culture is a critical condition that administrators need to create and maintain. The culture set should be free from bias upon a certain kind of differences, meaning that school management must perform their responsibilities under a neutral role to create a pleasant working environment for teachers, which will result in improved student behaviors and academic achievements. (Ellison, et, al. 2005).

One hundred years ago, in 1908, Perry was the first educational leader who explicitly wrote about how a school climate may affect students and their learning process. Then in 1927, Dewey wrote explicitly about the school climate, focusing on the social dimension of school life along with increased skills and knowledge, as well as implicitly about what type of environmental or climate conditions are reflected in schools. Empirical school climate research was conducted in Jakarta around the 1950s when Hapin and Croft in 1963 systematically studied the impact of school climate on student learning and development (Halpin, & Croft, 1963). At the beginning of the study, the focus was on seen or observable characteristics of the school such as the existence of plants and the physical conditions of the school. Although educators have talked and focused on the school climate for more than a century, no proposed climate have had a welcoming acceptance (Cohen, McCabe, Michelli, & Pickeral, 2009). In the later years, American researchers were looking into schools to comprehend the construct of a quality environment where students can develop skills and character that support their ability to work as well as their passion and contribution towards the enthusiasm and participative democracy needed to face future changes and transitions. In 2007, the United States center for social and emotional education formed a national school climate council, a diverse policy and practice group comprising of leaders dedicated to narrowing unfair social inequalities. (Cohen, Fege & Pickeral, 2009).

School climate, according to the National School Climate Council 2007, is the quality and character of a school life. The school climate is based on people's experience patterns of a school life and it is reflected through norms, goals, values, interpersonal relationships, teaching, learning, leadership practices, and organizational structure. In other words, school climate is the quality and character of the school (Cohen, McCabe, Michelli, & Pickeral, 2009). School climate is a strong characteristic that can help build and grow resilience whilst simultaneously have the potential to be a risk factor for students, teachers, administrators, parents, and other members of the school community (Freiberg & Stein, 1999). School climate is the quality and character of a school life in concern with values, norms, interpersonal relationships and social interactions as well as organizational processes and structures (Dewwit & Slade (2014). School climate is a set of norms and expectations of people upon students in relation to the perception of the school as well as its personality (Brown, Anfara, & Roney 2004). School climate is learning environment created through human relations as well as physical and psychological regulations (Perkins, 2006).

School climate is an abstract concept to be measured and thus a measurement tools are needed to be able to comprehensively reveal a school climate to individuals. One of the tools that can be used to illustrate a school climate is the school climate scale which can be constructed based upon aspects of engagement, empowerment and autonomy, inclusivity and equity as well as environment (Dewwit & Slade, 2014). The engagement aspect implies that each individual interprets engagement in different ways. Involvement includes good communication between fellow school members, especially teachers and students, in which can both feel important, valued, and accepted by each other. Empowerment and autonomy an important role to build a positive and inclusive school climate. Students feel empowered when they feel that they can have a voice in their own learning process. Theinclusivity and equity aspects are related to race, sex, religion or sexual orientation in that every individual, regardless of their backgrounds, must have a place in school. Environmental aspect includes the emotional and physical social environment. The emotional social environment is comprised of security, comfort, and beauty whereas the physical environment comes in the form of facilities and infrastructure within schools.

A aspect conceptual framework of school climate consisting of engagement, empowerment and autonomy, inclusivity and equity, and environment. Figure 1.

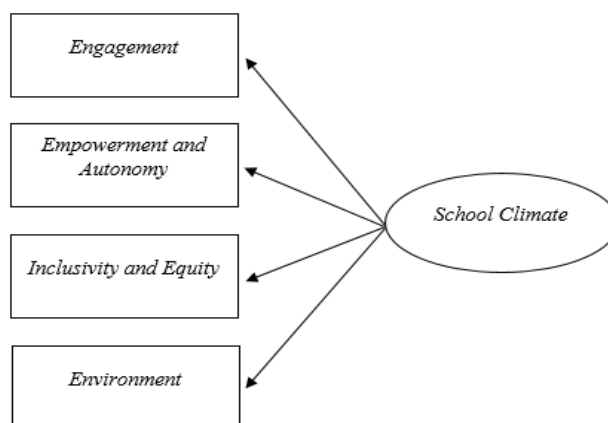


Fig 1. Conceptual Framework of School Climate Aspect

Hypothesis

Based on Figure 1, the research is set as follows:

School climate aspects, namely: engagement, empowerment and autonomy, inclusivity and equity and environment, are able to shape the construct of the school climate

School Formulation

Based on the description above it can be said that the school climate has a very important influence upon students when they are in the school environment. Considering the importance of the school climate, the following questions arise: 1) Is the construct of the school climate valid and reliable? 2) Do the aspects of engagement, empowerment and autonomy, inclusivity and equity and environment shape the construct of the school climate?

Second Order Confirmatory Factor Analysis (2nd order CFA)

One approach used in testing the construction of a measurement instrument is the confirmatory factor analysis. Confirmatory factor Analysis (CFA) is one of the main existing approaches in factor analysis. CFA can be used to test the dimensionality of a construct and is used for measurement models. The analysis can describe aspects and indicators of behaviors reflecting the latent variable, namely the school climate, by looking at the loading factor of each aspect that forms a construct. Confirmatory Factor Analysis (CFA) is also used to test the construct validity and construct reliability of the indicators (items) that make up the latent construct (2012). The CFA used in this research is the second order confirmatory factor analysis (2nd order CFA), a measurement model that consists of two levels. The first level of analysis is carried out from the latent construct of aspects to the indicators and the second analysis is carried out from the latent construct to its aspect construct (Latan, 2012).

Research Aim

Based on the description above, this study aims to test the construct validity and construct reliability of the school climate constructs set upon a different country and culture from previous studies.

II. RESEARCH METHOD

Participants

The research subjects or participants of the study were teenage students with a total sample of 60 individuals. They are aged 16-18 years and were willing to be participants of the study whereby research data were distributed online.

Instruments

The data collection method used in this study is scale. School climate, in reference to Dewitt and Slade (2014), consists of aspects of engagement, empowerment and autonomy, inclusivity and equity, and environment. The scale designed was composed of two forms of statements, namely supportive or favorable statements and unsupportive or unfavorable statements. Examples of the school climate valuation from the aspect of engagement include "I have the desire to go to school to meet with many friends", "The teachers help a lot when I face difficulties in understanding". An example of the

aspects of empowerment and autonomy is "I like learning in class with subjects that I like, and there are many things I learned". The inclusivity and equity aspects take an instance of "I feel comfortable in school, my friends treat me well" whereas the environment aspect takes form such as "There are lot of things I don't like at school, my friends' attitudes make me depressed".

Data collection was done using a scale method proposed by Azwar (2013). The scale used in this study is a Likert scale with each scale having four alternative answers separated into favorable statements and unfavourable statements with ratings using four categories of answers. The score values of the statements can be seen in Table 1. School climate scale scores

Table 1. School Climate Scale Scores

No	Response	Favourable	Unfavorable
1	Strongly Agree (SA)	4	1
2	Agree (A)	3	2
3	Disagree (D)	2	3
4	Strongly Disagree (SD)	1	4

The authors used 32 items in sscale consisting of 16 favorable items and 16 unfavorable items. The following is the School Climate blue print:

Table 2. School Climate Blue Print

No	Aspect	Item		Amount
		Favorable	Unfavorable	
1.	Engagement	1,2,3,4	5,6,7,8	8
2.	Empowerment and autonomy	9,10,11,12	13,14,15,16	8
3.	Inclusivity and equity	17,18,19,20	21,22,23,24	8
4.	Environment	25,26,27,28	29,30,31,32	8
	Total	16	16	32

Validity and Reliability

This research was conducted to test validity and reliability using the Smart PLS 3.0 program with a reflective construct. Aimed at testing the measurement model, the validity test includes convergent validity (seen from the loading factor > 0.5 and value extracted > 0.5) and discriminant validity (the ratio of the average variance extracted square root value upon the same element or aspect must be higher than that in relation to other aspects). The reliability test is used to show the internal consistency of the measurement instrument used through analysis of composite reliability and Cronbach's alpha values, in which according to Cooper, the value obtained must be > 0.7 (Jogiyanto, 2011).

III. RESULT

The results of the analysis of the outer model test on the school climate scale conducted using the Smart PLS 3.2.8 program can be seen in Figure 2 below.

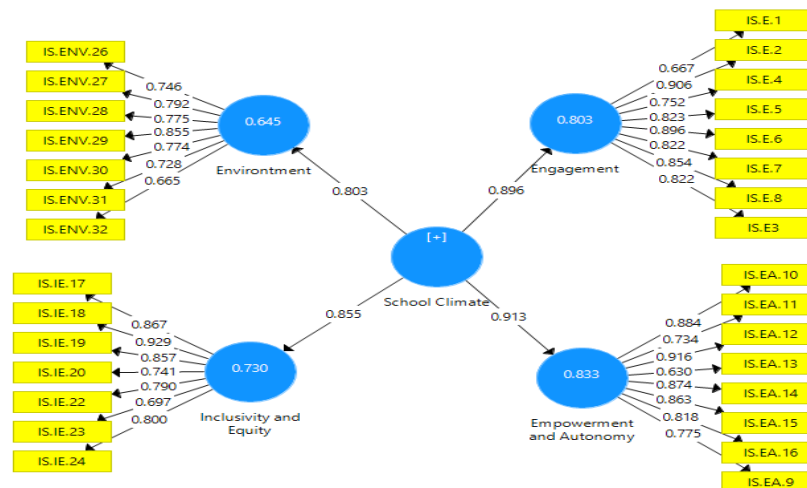


Fig. 2 The results of the analysis of the outer model test on the school climate

Based on the School Climate outer model test, the following outcomes are obtained: Convergent Validity
In respect to the convergent validity, the loading factor values obtained all fulfilled the requirement of > 0.5 as can be seen in the table below.

Table 3. Loading Factor Values (Variable-Aspect)

Aspect	Loading Factor	Description
Engagement	0.803	Valid
Empowerment dan Autonomy	0.833	Valid
Inclusivity dan Equity	0.730	Valid
Environment	0.645	Valid

Convergent validity as presented by the loading factor values, in terms of aspect-indicator, fulfilled the requirement of > 0.5 , which can be seen in the following table:

Table 4. Loading Factor Values (Aspect -Indicator)

Item	Loading factor	Description
IS.E.1	0.667	Valid
IS.E.2	0.906	Valid
IS.E.4	0.752	Valid
IS.E.5	0.823	Valid
IS.E.6	0.896	Valid
IS.E.7	0.822	Valid
IS.E.8	0.854	Valid
IS.E.3	0.822	Valid
IS.EA.10	0.884	Valid
IS.EA.11	0.734	Valid
IS.EA.12	0.916	Valid
IS.EA.13	0.630	Valid
IS.EA.14	0.874	Valid
IS.EA.15	0.863	Valid
IS.EA.16	0.818	Valid
IS.EA.9	0.775	Valid
IS.IE.17	0.867	Valid
IS.IE.18	0.929	Valid
IS.IE.19	0.857	Valid
IS.IE.20	0.741	Valid
IS.IE.22	0.790	Valid
IS.IE.23	0.697	Valid
IS.IE.24	0.800	Valid
IS.ENV.26	0.746	Valid
IS.ENV.27	0.792	Valid
IS.ENV.28	0.775	Valid
IS.ENV.29	0.855	Valid
IS.ENV.30	0.774	Valid
IS.ENV.31	0.728	Valid
IS.ENV.32	0.665	Valid

Convergent validity, as presented by values of average variance extracted (AVE), presents that the school climate construct obtained a value of 0.550 in addition to the values of the aspects which also satisfy the value > 0.5 . The following displays values of the Average Variance Extracted (AVE):

Table 5. Average Variance Extracted (AVE) Values of School Climate Constructs

Aspect	AVE Value	Description
Engagement	0.674	Valid
Empowerment dan Autonomy	0.667	Valid
Inclusivity dan Equity	0.664	Valid
Environment	0.584	Valid

Based on the discriminant validity test, the constructs of the school climate all satisfy the statistical requirement where the square root values of the AVE between the same aspect are higher than the values obtained when a particular aspect is compared to the aspects that are not its own. The AVE square root values are presented as follows:

Table 6. Average Variance Extracted (Ave) Square Root Values of School Climate Constructs

Aspect	Engagement	Empowerment and autonomy	Inclusivity and equity	Environment
Engagement	0.821	0.820	0.649	0.564
Empowerment and autonomy	0.820	0.817	0.652	0.638
Inclusivity and equity	0.649	0.652	0.815	0.746
Environment	0.564	0.636	0.746	0.764

Reliability test in respect to composite reliability and Cronbach alpha values all fulfilled the requirement value of > 0.7 which can be seen in the following table:

Table 7. Composite Reliability and Cronbach Alpha Values of School Climate Constructs

Variable	Composite Reliability	Cronbach Alpha	Description
School Climate	0.966	0.963	Reliable

The results of construct reliability testing with 2nd Order Confirmatory Factor Analysis shown in Table 6 show that the constructs have good reliability and that the aspects that measure the construct/latent variable of school climate meet the unidimensional criteria at 0.966 with Cronbach Alpha value at 0.963.

Based on processing and analysis of research data on the elements of the school climate variables/constructs based upon using the 2nd Order Confirmatory Factor Analysis, results show that the model is acceptable as all dimensions are able to reflect the variables/constructs formed.

IV. DISCUSSION

Aspect Dominance

Based on the results of the analysis of construct validity and construct reliability, all aspects are able to influence or set a school climate among adolescents with exceptional validity and reliability. The most dominant set of aspect in shaping the school climate is the empowerment and autonomy aspects where students play active parts in the learning process. Its main items include "I enjoy learning in class with subjects that I like. There are many things I learned in school" with a loading factor of 0.833.

The least dominating aspect that reflects the school climate is the aspect of the environment where the main indicator is the emotional social environment encompassing security and comfort as well as the physical environment in the forms of facilities and infrastructures available in the school. The main items include "I feel happy when my classmates care for one another, all activities in the school are supported with adequate facilities" with loading factor of 0.645.

A study from Rezapour, Khanjani and Mirzaee (2020), with the title Construct Validity of Maryland Safe and Supportive Schools Climate Survey in Iran, takes a look into the school climate by measuring aspects of school involvement through six factors, namely the relationship with teachers, relationship with students, student involvements, academic involvements, school connectivity, equality and parental involvements. Their findings obtained Cronbach Alpha value of 0.94 and thus said to be valid measurement scale. In comparison, the present study focuses on four aspects among which is engagement with Cronbach Alpha value of 0.963.

Bradshaw, Waasdorp, Debnam, and Johnson (2014) in a study measuring school climate based on environmental aspect that influence comfort, physical hygiene, emotional support and disturbances shows item

with Cronbach Alpha of 0.85 considered as valid. Likewise, the present research also used the aspect of involvement in measuring the school climate.

Bradshaw, Waasdorp, Debnam, and Johnson (2014) also measured aspects of involvement by exploring six factors namely teachers involvements, student connectedness, academic connectedness, connectedness throughout the school, culture and justice, as well as parental involvements which obtained Cronbach alpha score of 0.94 and thus it is said to be valid in its measurement. Meanwhile, this research used four aspects among which are engagement and environment with Cronbach alpha of 0.963.

V. RESEARCH IMPLICATION

The results of this study are expected to provide an overview of the validity and reliability of the school climate constructs in the context of adolescents in schools as a reference in subsequent studies related to school climate.

VI. CONCLUSION AND RECOMMENDATION

The school climate constructs exhibit exceptional validity and reliability, whereby all aspect and indicators can significantly form or influence a school climate variable. The indicator which has the most dominant influence on the school climate is the empowerment and autonomy with loading factor value of 83.3%. Thus, the findings within the present research are able to offer theoretical implications in the development of school climate and implications towards students' school environment. Additionally, testing of the school climate model can be improved by using other variables, expanding the research units, or through using different school climate contexts so that research results can be generalized.

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