ICEE-2

Validation of a Scale on Pupil Wellbeing at the Elementary Schools

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Abstract. The child wellbeing at schools as an outcome had not been taken into serious consideration due to lack of measurement scale. The prime purpose of the present study was to develop and validate a scale on pupil wellbeing at elementary schools. Commencing from pooling and screening items, questionnaire consisted of 9 items were administered to 304 children at four elementary schools. Using principal axis factoring with oblique rotation, the analysis suggested that one item should be dropped and that the remaining eight items could best be represented by two factors. The obtained data were analyzed to find the underlying factors. The next step, the remaining items were distributed to 484 pupils at seven schools. A confirmatory factor analysis, using structural equation modeling, was run to test the hypothesized constructs from the previous exploration. Model fit was improved. The constructs were confirmed valid and reliable. These results led to a refined, more parsimonious version of the scale that would then use in a larger study.

Keywords: pupil wellbeing, exploratory factor analysis, confirmatory factor analysis, elementary schools

INTRODUCTION ~ Thinking about wellbeing was not only used for social, organizational and governmental scale but also for individual and educational research. The reasons underlying the amount of individual and state attention to the problem of wellbeing, were that wellbeing not only functions as an objective to be achieved by individuals, but wellbeing was also a mean to achieve other goals and could facilitate the emergence of desired behavior. Some studies showed that wellbeing was not only a consequence of a good life (Hoy & Tarter, 2011; Lyubomirski, King & Diener, 2005; Randolph, Kangas, & Roukama, 2009; Rojas, 2018) but wellbeing also as a predictor of success (Aarö, Wold, Kannas, & Rimpelä, 1986; Levy-Garboua, Loheac, & Fayolle, 2006; Maccagnan, Wren-Lewis, Brown & Taylor, 2019).

In the context of education, student-level factors had some impact on school processes in addition to academic achievement. Research revealed school-related factors such as (a) school satisfaction (Huebner & Gilman, 2002; Natvig, Albrektsen, & Qvarnstrom, 2003; Samdal, Nutbeam, Wold, Kannas, 1998) (b) teacher support (Leung & Leung, 1992; Suldo & Huebner, 2006), (c) perceptions of academic competence (Leung, McBride-Chang, Lai, 2004; Huebner, Gilman, & Laughlin, 1999; Verkuyten & Thijs 2002), (d) group climate and bullying (Strijbosch, Helm, Stams, Wissink, 2018) played important roles in emotional wellbeing and overall life satisfaction of students. The implication for education practitioners and researchers was to try to modify the academic environment to produce desirable achievements as well as their impact on subjective wellbeing (Suldo, Riley, Shaffer, 2006). However, the cohort of school researchers often ignore to examine wellbeing. One factor limiting student wellbeing research and satisfaction with

schools was the limited valid and reliable measurement tools for use in a wide variety of educational settings (Ootegem & Verhofstadt, 2019; Suldo et al. 2006). Therefore, this study attempted to develop and examine a scale, and its psychometric features, which had been developed to be valid, steady, and easy to use.

We hoped this scale could be used by education practitioners to identify students who were disappointed with school, which were associated with subjective wellbeing (Huebner & Gilman, 2002), risk behaviors (Lévy-Garboua et al. 2006), and the appearance of fitness (Natvig et al, 2003) so that the right repairing phase could be taken. Also, it was hoped that this scale could be used by researchers, and education developers when thinking that a number of educational policies, programs and interventions had an impact on student satisfaction. The motivation for this validation study was to facilitate the improvement of school satisfaction, which results in the life satisfaction of every student in the school environment. We realized that there were still many other variables that could be investigated besides student happiness. But it all could be grouped to educational policies, programs and interventions that lead to increased happiness and the quality of children's lives.

This present study focused on measurement validation effort had two purposes. First, related exploring appropriate constructs and indicators to measure pupil wellbeing at elementary schools. Second, tested to confirm whether the constructs and indicators were valid and reliable.

Literature Review

Happiness which is often the operationally termed as wellbeing or hypothesized contains three factors: positive affect, negative affect, and life satisfaction (Suldo et al, 2006). Life satisfaction, which was the most stable compared to the other two factors, defined by Suldo et al. as a global assessment that reflected the joy of his entire life. Huebner and Gilman (2002) revealed that children's life satisfaction appears in the form of five different domains: school, self, family, friends, and the environment. According to Suldo et al., There were four main constructs that underlied the satisfaction of life of children in the school domain, namely:

- Award one's happiness at school (i.e. school satisfaction)
- Perceptions of school climate factors (e.g. teacher support)
- Intelligence and ability grouping in schools
- Perceptions of objective academic achievement

The overall assessment of one's happiness towards school was a construct that mostly stated as the measurement scale.

Five instruments that were widely and long used to measure satisfaction with schools: the Multidimensional Students Life Satisfaction Scale (MSLSS: Huebner 1994; Hatami, Motamed, Ashrafzadeh, 2010); the Brief Multidimensional Students' Life

Satisfaction Scale (BMSLSS: Seligson et al. 2003), the Quality of School Life Scale (QSL: Epstein and McPartland 1976), the self-report of personality (SRP) component of the Behavior Assessment System for Children (BASC-2: Reynolds and Kamphaus 2004; Lane, Oakes, Comon, 2019) and three items from the World Health Organization's Health Behavior among School-Aged Children Survey (HBSC: Aarö et al. 1986; Wold et al. 1994).

MSLSS was a measuring instrument containing 40 items to measure student satisfaction in the school domain, yourself, family, friends, and the environment. The eight items from the school satisfaction sub-scale were:

- I look forward to going to school.
- I like being in school.
- School is interesting.
- I wish I didn't have to go to school.
- There are many things about school I don't like.
- I enjoy school activities.
- I learn a lot at school.
- I feel bad at school.

The response choices for these items were (1) never, (2) sometimes, (3) often, and (4) almost always. Huebner (1994) reported an estimate of internal reliability of 0.85 for this subscale, demonstrated the unidimensionality of items through factor analysis, and presented evidence of convergent and discriminant validity from the measurement.

BMSLSS consisted of five items, each assessing a domain in MSLSS. The question related to school satisfaction in BMSLSS is "I would describe my satisfaction with my school experience as: terrible, unhappy, mostly dissatisfied, mixed, mostly satisfied, happy, or happy" (Seligson et al. 2003). Segligson et al. reported adequate internal reliability for the entire scale (a = 0.75). In addition, they established the convergent and divergent validity of BMSLSS in relation to several other scales, such as MSLSS (Huebner 1994), Student Life Satisfaction Scale (SLSS: Huebner 1991), Positive and Negative-Child Influence Schedule (HEAT-C: Laurent, Cantanzaro, Thomas, Rudolph, Potter, Lambert, Osbore, & Gathright, 1999; Leue & Lane, 2011), and the Children's Social Desire Questionnaire (Crandall et al. 1965). The coefficient of validity between BMSLSS school items and MSLSS school related items was 0.53.

The Epstein and McPartland QSL Scale (1976) was a 27-item scale intended to measure the quality of school life. Their scale had three different factors: Satisfaction with Schools, Commitment to Class Work, and Positive Reaction to Teachers. According to Epstein and McPartland, Satisfaction with the School subscale "takes association with the quality of students' social experience," the Commitment to Class Work subscale "is most responsive to an individual's belief in the consequences of school work and the character of the work itself. , "And Positive reactions to Teachers, subscales are mostly related to" the quality of the classroom

environment created or supported by teachers". Overall, these three subscales form constructs - the quality of school life. Epstein and McPartland (1976) report reliability KR-20 for the entire QSL scale ranging from 0.86 to 0.89 depending on the grade level of students. Reliability of the QSL subscales ranged from 0.64 to 0.81. In addition to proof of reliability, they also provided various types of evidence for scale validity.

BASC-2 (Reynolds and Kamphaus 2004) was a multimetode, multidimensional system used to evaluate the behavior and self-perception of children and young adults aged 2 to 25 years. The personality component self-report (SRP) of BASC-2 had items concentrated on attitudes toward school, attitudes towards teachers, and school adjustments. For SRP, Reynolds and Kamphaus reported a series of estimates of internal consistency scale from 0.72 to 0.82 for students aged six and seven and estimated internal consistency from 0.71 to 0.86 for students aged eight to eleven. They also reported retesting estimates of 0.63 to 0.82 for elementary school-age students.

Although a number of reliable and valid steps for measuring student satisfaction with school had been developed, we were motivated to create our own scale for a number of reasons. First, we wanted to utilize the idea of school satisfaction that had been developed by previous researchers using Indonesian for elementary schools students. Second, from the many items that were collected, we wanted to make a short set that could be easily managed and where reliability information has been collected. Third, we wanted to broaden various measures of student satisfaction to help the research community avoided what Shadish, Cook, and Campbell (2002) called mono-method biases, that resulted from construct measurements in only one way. Fourth, we wanted to create a scale across languages in this country so that it could be used for the cross-cultural research community.

METHODS

Research design. This study used a multi-methods design that began with a qualitative approach by generating relevant items and possible constructions that were present in school communities. This preliminary stage was gathering and filtering out items that had the opportunity to reveal the wellbeing of children in elementary school. The collected items were selected for the preparation of questionnaires for students in schools.

This was followed by the main quantitative research which consisted of two main objectives. First, to explore and clarify wellbeing dimensions that were adequate and valid according to psychometric principles. In this stage, data collection was carried out from a number of schools to explore the dimensions of wellbeing and the accuracy of grouping items. And the second stage, confirmed the validity and reliability of constructs and items that were appropriate for measuring student wellbeing at school. In this last stage, the

results of the second stage of the questionnaire were used on a broader scope to ensure that this instrument was indeed valid and reliable.

Preliminary Part

At the earliest stage, a small group of students was tested on simple questions about the reasons or causes they feel happy. The results shown from the 12 reasons stated, 4 of the most prominent were:

- Many friends
- Success in school
- Happy family
- Healthy

Then the following questions, asked how each child assessed his/her happiness compared to his/her peers. As a result, most considered him not very bad. Related to 25 items that were more detailed, the majority of the answers had already known. From the data collected it was concluded, wellbeing was familiar and nothing new to children.

Through the "nominal group process" of three groups of 5 children, 9 items were produced that were eligible to be used as questionnaires for children at elementary schools. The nine items were

- Lessons in class, what do you feel with?
- When the teacher asks, what do you feel?
- Studying at school, is it fun?
- When playing with classmates?
- When talking with class teachers?
- When you go to school, what do you feel?
- What do you feel with assignments from the teachers?
- Your classmates, are they fun?
- Do you happy with your test scores

Main Study

Two steps were taken in the main study. First stage. In accordance with the characteristics of elementary school children's interests, the questionnaire was prepared with a choice of smiley expressions. A smiley face was a sign of happiness, a flat face was a sign of mediocrity or no expression, and a sullen face meant boring or unhappy. Children were asked to cross one of the facial expressions they like. The first questionnaires were distributed to 304 children from four elementary schools in Malang. Second stage. And for the sake of confirmation, a second questionnaire with the same item was administered to 484 children in seven elementary schools in Malang Regency.

Data analysis. Quantitative data collected through a questionnaire in the first stage was analyzed by exploratory factor analysis to explore the construct(s) and content of items. Data collected in the second stage were analyzed by confirmatory factor analysis, followed by Cronbach's Alpha calculation to estimate internal consistency.

RESULTS AND DISCUSSION

There were two main purposes of this study. The first was exploring, and the second confirming the construct and item constructions of the scale to describe the children wellbeing at schools. These purposes used different sources of data and been analyzed by different tools.

Exploration of Construct and Items.

The first concern was the assessment of the likelihood of latent variables(s) that were reflected by the nine items as observed variables. There were 304 students who filled out the initial questionnaires, all from 4 elementary schools. No data was missing in the initial test. By using IBM SPSS, the KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.816) analysis produced a coefficient to ensure that the sample size was very good. In relation to correlation characteristics, the Bartlett's test results (Bartlett's Test of Sphericity = 766,301, Significance = 0.00) produce Loading (□) and Communality (h^2) as presented in Table 1.

The puzzle on the right number of factors was answered as follows. Scree plot of the scale (Figure 1) showed the plateau at the sign of two factors. Two-factor clues were also supported by the magnitude of the Eigenvalue, greater than one. Thus it was ensured that the solution of the number of constructs was not one but two factors. The Maximum Likelihood extraction with oblique rotation produced two factors which were shown in Table 1. The loading of the two factors reflected: teacher relations for the first factor and peer relations in the class for the second factor. These two factors are named "teaching atmosphere " and "learning atmosphere". By using the cutoff loading criteria 0.3, the fourth item did not meet the requirements. This item statement expressed feeling happy when playing with classmates. Besides loading, this item was also too low, so it should be aborted. Disposal of this item could be explained, association between friends tended to have a negative impact on the atmosphere of teaching and positive atmosphere of learning so that it tended to blur the indication on child's wellbeing.

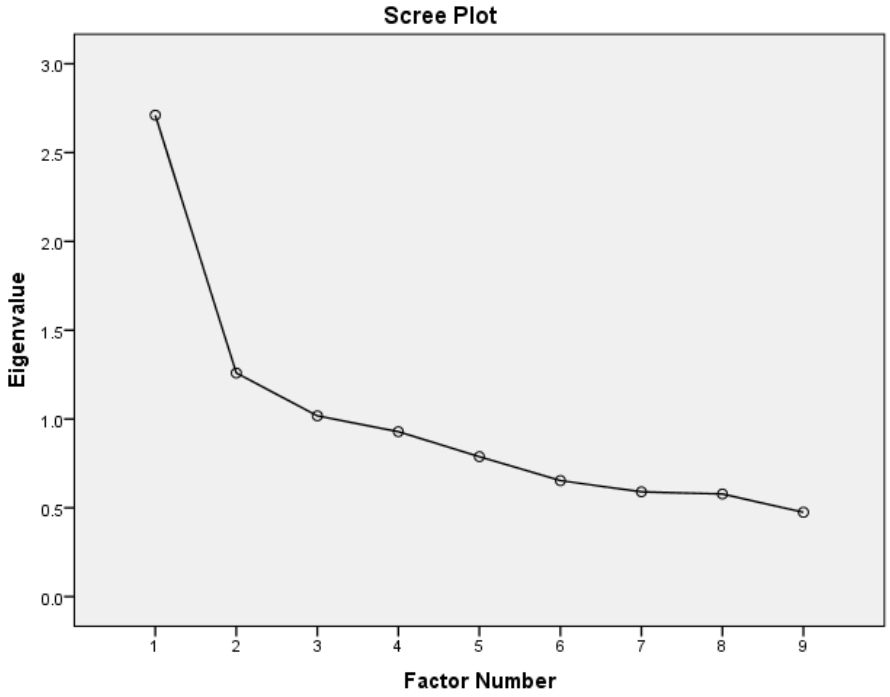

Figure 1. Scree Plot for initial analysis

Table 1. Pattern of Two Factors for Pupil Wellbeing

No	Item	Loading (□)		Communality (h^2)
		Factor I	Factor II	
1	Lessons in class, what do you feel with?	**.471**	.064	.244
2	When the teacher asks me?	**.974**	-.276	.324
3	Studying at school, is it fun?	**.402**	.286	.279
4	When playing with classmates?	-.091	.297	.075
5	When talking with class teachers?	**.395**	.185	.238
6	When you go to school, what do you feel?	.202	**.329**	.151
7	What do you feel with assignments from the teachers?	.298	**.475**	.285
8	Lots of fun friends in my class	-.006	**.413**	.137
9	I'm happy with my test scores	.138	**.467**	.193
	Eigenvalue	2.711	1.259	
	% of explained variance:	30.122	13.988	

Notes: Bold coefficients were considered as significant loading.

Factor 1, Teaching Atmosphere

Factor 2, Learning Atmosphere

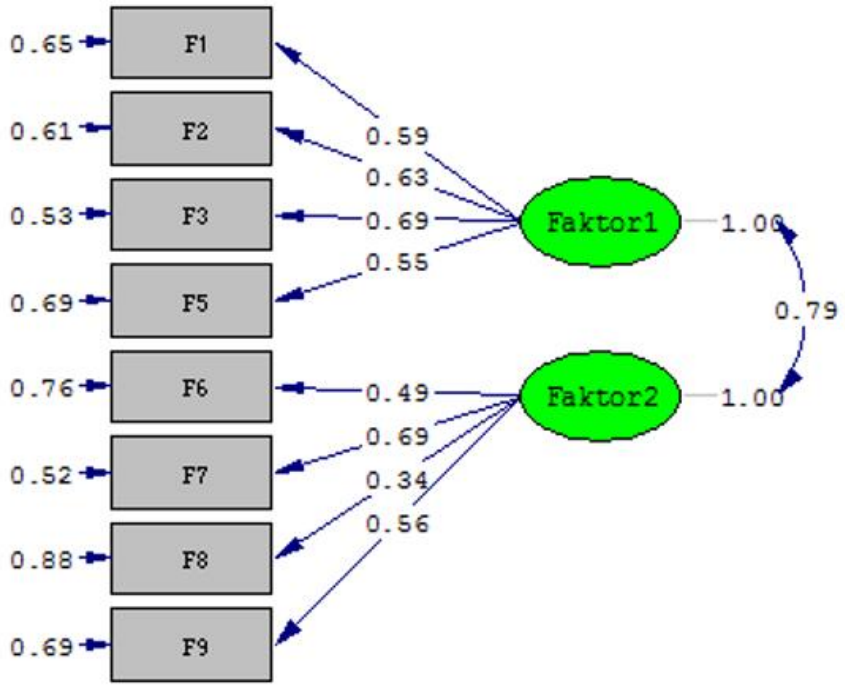

Figure 2. The two-factor, 8-item standardized solution

When all 9 items were included in the analysis, the first component contributed 30.12% of the variance, and the second component accounted for 13.99% of the variance. The correlation between the two factors was low (r = 0.342), meaning that both were to be independent. Therefore analysis and interpretation of the two factors were appropriate if made them separate.

Confirmation of the Constructs and Items.

For the sake of confirmation, a second questionnaire with the same item was administered to 484 children in seven elementary schools in Malang Regency. The purpose of confirmation was followed by using Confirmatory Factor Analysis on LISREL.

A confirmatory factor analysis model (shown in Figure 2) was tested using LISREL 8.5. The two latent variables were identified by the exploratory factor analysis in the previous part. The 8 observed variables were the actual items. Parameters led to each item from the factor hypothesized to represent that item. Parameters also led from an overall latent factor, as wellbeing, to two separate factors. The resulting goodness-of-fit indices, shown as follows. The two-factor model showed, chi-square difference (19) = 6611.15, $p < 0.000$, was statistically significant, indicating that the model did not fit the data well. However, the RMSEA of 0.05 indicated model close to fit. Whereas, the examination of the coefficients in the model revealed that the parameters of all two factors to each of their items were all significant, indicating that the items did indeed relate to those factors.

The internal consistency of this pupil wellbeing scale was checked by calculating the alpha coefficient utilizing IBM SPSS. Cronbach's alphas for the first and second constructs were 0.70 and 0.60. This is classified as medium and low. The overall alpha coefficient was marginal. Bear in mind that alpha coefficient is sensitive to the number of items. A large number of items in a factor will almost always result in a large alpha value (Pedhazur & Schmelkin, 1991). This study found that each construct had only four items.

Efforts to obtain a construct were pursued through factor analysis. This analysis due to be not sensitive to the number of items in a factor, could help providing the structure of evidence. Exploratory factor analysis was used to see what factors emerged from actual data while confirmatory factor analysis could be used to determine if the factors hold up (Pedhazur & Schmelkin, 1991). The second analysis confirmed the first.

The administration, scoring, and interpretation of this scale was explained as the following. This scale was intended to be given in the school environment to students from the age of seven to 12 years. For education researchers, this measurement tool could be used for the scope of primary schools in Indonesia based on the criteria of language simplicity and had sufficient validity information because it departed from the expression and understanding of children. The score of this measuring tool was obtained by adding up the value of each item, which ranged from 1 to 3. Possible values of the scale range added from 3, the lowest satisfaction level, to 24, the highest satisfaction level. If one or two items are missing in a case, we recommend replacing the missing value with a median score on another item.

This measure was not free from weaknesses. In this study, there are no resources to check the external validity of this scale. In future research, we intended to link this scale with other instruments to measure student wellbeing. The multicultural conditions of the nation had not been considered, although previous research (Ayyash-Abdo & Sanz-Ruiz, 2012; Li, Xing'an, Lu, & Gursoy, 2018) had regarded the content of cultural values in interpreting wellbeing.

Thus it would be said that Wellbeing was a concept that ideally measured in the context of basic education in the various cultural environments of the archipelagoes. However, the results of certain analysis indicate caution, because the results of the estimated reliability of a number of constructs were in the low and medium categories. This phenomenon makes it possible to group a number of items differently from what was once conceptualized and needs to be continually assessed.

The assessment undertaken through this research has implications for further research that should be more extensive and in-depth. Results Development of measuring instruments in the form of a

wellbeing scale in order to color the social cultural context already be used. In the context of education management, wellbeing would be investigated more intensively to complete the explanation of a number of complex organizational behavior symptoms. With developments in research methodology, wellbeing might be studied flatly or hierarchically, both qualitatively and quantitatively and in combination (qualitative and quantitative). The development of studies that examine causal relationships in the context of wellbeing both additive and interactive should be done for the development and copying the educational matters.

CONCLUSION

Validating a scale was not a one-time effort. This study found eight valuable items and two constructs under the criteria of validity and reliability. However, these results had not satisfy the requirement for goodness-of-fit. For further ongoing validation of the pupil wellbeing, we offer the following suggestions to overcome limitations encountered in the present study. First, generalizability-related evidence of validity is beyond the scope of this study; in other words, additional evidence for validity as to generalizability needs to be discussed by applying the wellbeing to populations other than elementary school pupils. Second future research requires polishing criterion related evidence of the remaining sub-scales of the wellbeing. Lastly, to explore the possibility of replication the scale structures, a cross-cultural construct validity of the wellbeing needs to be tested.

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