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Development and Initial Validation of Emotional Support and Achievement Motivation Scales as a Part of Redi-Space Assessment

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ABSTRACT

It is well-known that self-regulation is one of the most prominent factors that influences success in learning. Prior research suggested not only a new method in the measurement but also an intervention to develop it. The main aim of this research introduced online questionnaire and validated it. This questionnaire is part of REDI-Space, a self-regulation website. Self-regulation cannot be seen as a single variable but it correlates with other variables such as emotional support and achievement motivation. Thus, in the development of Indonesian Self-Regulation Scales for Adolescence (ISRSA), researcher determines five variables as its contents. This study focused on the validation of two scales (namely, Emotional Support and Achievement Motivation Scale self-report questionnaire) given to students at one university in their first and second year of studies. Scales consisting of 20-item and 24-item were developed for Emotional Support and Achievement Motivation, respectively. Confirmatory Factor Analysis and test-retest reliability were demonstrated to analyse the data. From a group of numbered participants (N=216), there were strong internal consistency, discriminant validity and construct validity. Further research involving other universities can enrich the data to reach a better generalisation.

Keywords: Achievement motivation, college students, emotional support, REDI-Space, self-regulation

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INTRODUCTION

Adolescents often face challenging situations, such as academic tasks, which not only require cognitive and metacognitive skill, but also demand other supports to maintain their effort coping with difficult situations like finding the appropriate peers

and career (Ormrod, 2010; Santrock, 2011; Woolfolk, 2010). Support can be obtained from peers or teachers (Torsheim et al., 2012). Teacher support is considered as a critical and central role in maintaining students' motivation to learn (Becker & Luthar, 2002; Pianta, Hamre, & Stuhlman, 2003; Stipek, 2004). Therefore, students-teacher relationships should be considered in attaining learning goals (Wentzel, 2009). However, research that focused on adolescents in college was still limited and chose other periods due to academic growth (Mercer, Nellis, Martinez, & Kirk, 2011) or transition (De Wit, Karioja, Rye, & Shain, 2011).

Emotional support derives from significant others in students' life such as teachers. Teachers' support can be defined as positive climate, teacher's sensitivity and also warmth which are students' crucial needs, particularly in academic effort (Schnell, Ringeisen, Raufelder, & Rohrmann, 2015). Experts have said that emotional support is focused on positive climate and lecture sensitivity, because warmth is part of sensitivity (La Paro, Pianta, & Stuhlman, 2004; Santrock, 2011). Based on the above conceptual and empirical work, emotional support by teacher can be conceptualised as involving the (a) positive climate that can be evaluated by students due to lecturer effort, and (b) lecturer sensitivity that is characterised by lecturer's empathy and warmth in appraising students' effort when they cope with challenging situations.

Gaining good performance in an academic setting is the general goal for students learning in a formal institution (Ormrod, 2010; Santrock, 2011; Woolfolk, 2010). This phenomenon is called achievement motivation (Dalton, 2010). In the beginning, achievement motivation was refered to as mastery and performance goal (Ames, 1992; Elliot & Dweck, 1988; Maehr & Midgley, 1991; Nicholls, 1984). Then, performance goal was separated into performance approach and performance avoidance (Elliot & Church, 1997; Elliot et al., 1999; Elliot & McGregor, 2001; Sideridis, 2005; Skaalvik, 1997). They performed achievement goals in terms of competence. Thus, the outcome can either be a desirable possibility (i.e., success) or an undesirable possibility (i.e., failure) (Elliot, McGregor, & Gable, 1999). Therefore, for a student who is expecting success will apply an approach orientation, whereas a student who expects failure will adopt an avoidance orientation (Barzegar, 2012). In this study, the researcher adopts mastery goal, performance approach goal, and performance avoidance goal.

The role of cultural background cannot be neglected when it comes to academic performance. It influences students' and teacher's perception of the positive behaviour according to cultural context (Ormrod, 2010; Santrock, 2011; Woolfolk, 2010). Discussing the influence of culture, Indonesia can be defined as a collectivist country. Furthermore, we cannot deny the role of information technology in the measurement. Therefore, it is important to build a questionnaire which includes information technology and is suitable

in this specific setting so as to create a systematic conclusion about the population.

MATERIALS AND METHODS

Participants and Procedures

At first, researchers announced this research through poster and informal meetings with lecturers. We asked volunteers to take part in our discussions on deciding the constructs or variables that determine successful learning from both students' and lecturers' perspectives. After we had gotten some names, we gave the students and lecturers informed consent that revealed their contribution to this research. In each group, they were asked the following questions: What are students'characteristics that determine success in learning? What are the main competencies or abilities that support students' learning behaviour? What supports do students need? The first group consisted of five lecturers and the second group had ten students.

Interestingly, although discussions of each were held in the different places, both of the teacher and students proposed similar constructs. Based on the team's discussion, we decided four variables: self-regulated learning, achievement motivation, help-seeking behaviour, and emotional support from parents and lecturers. After we had obtained these variables, we reviewed the relevant literature so as to create blue print for each variable. Every week, the researchers met and approved the final items. In this study, we reported the validation of Achievement Motivation and Emotional Support Scales.

The participants who fulfilled these questionnaires were recruited in the subjects they attended. The participants are the students from the first- and second-year of college. The team explained the aim of this study to the programme's director and lecturers. After obtaining the permission, we went to the selected classes and asked the students for their email address using convenience sampling. It meant only the students who attended the classes gave their email address. Several students were absent, and we decided not to involve them because peers did not know their email address.

A total of 230 students agreed and gave their email addresses to participate in this study. However, 14 students were excluded because their responses to all the scales were similar and had the same pattern, i.e. their responses were merely copy of the previous answers. It indicated that they did not fully understand the sentences.

A final sample of 216 students was analysed. After the researchers had collected all the students' email addresses, they sent a website link containing the five scales. This website is called REDI-Space.

The participants were divided into first-year (54.2%, n=117) and second-year (45.8%, n=99) from three majors: Psychology (68.1%, n=147); Economics (24.5%, n=53); and Others (7.4%, n=16). Others referred to the students who were from other faculties other than Psychology and Economics. More than seventy-five percent (n=163) of the participants are female. Gender was normally distributed, with the skewness of -1.192 (*SE* = .05) and

kurtosis -.585 (SE = .01). Moreover, subject and grade showed a skewness of 1.341 (*SE* = .05), kurtosis .671 (*SE* = .01) and skewness of .168 (*SE* = .05), kurtosis 1.990 (*SE* = .01), respectively, indicating that data distribution was normal.

Measures

Emotional Support Scale. The initial Emotional Support Scale was composed of 20 items; a self-report measure was developed to assess students' perception of lecturer's support into two dimensions, positive climate and lecture sensitivity. However, considering the results of team discussions, it was found that ten items were unclear and ambiguous. Therefore, it was the final result in ten items.

Positive climate consists of four items and lecture sensitivity contains six items. The participants were asked to indicate the lecturer's support during learning interaction in the classes they had attended, with responses ranging from 1 (*not at all suit for me*) to 6 (*really suit for me*). Sample items of the positive climate dimension are such as "Lecturer treats all of the students equally" and "Lecturer expects students to respect each other." There were six items in the lecturer's sensitivity dimension such as "Lecturer considers students' ability in delivering knowledge" and "My lecturer is a warm person." The minimum score for positive climate and lecturer's sensitivity was 4 and 6, respectively. The maximum score for positive climate and lecturer's sensitivity was 24 and 36, respectively.

Achievement Motivation Scale. The Achievement Motivation Scale consists 12 items. The Achievement Motivation Scale asks the participants to indicate their motivation when fulfilling academic tasks. Similar to the previous scale, the students' responses ranged from 1 (*not at all fit for me*) to 6 (*really fit for me*). This scale consists of three subcales, namely mastery goal (5 items), performance approach (4 items), and performance avoidance (3 items). The minimum and maximum scores for mastery goal are 5 and 30, respectively. The minimum and maximum scores for performance approach are 4 and 24 and for the last subscale are 3 and 18, respectively. Sample items for each subscale: "The subject that I learn is interesting" (mastery goal); "I insist on achieving a better grade compared to others in class" (performance approach); "I am concerned with the possibility of getting worse grades compared to my friends".

RESULTS AND DISCUSSION

REDI-Space

As mentioned earlier, this study used a website as a tool to collect data. It is called REDI-Space. After discussions to determine constructs, the researchers agreed that the website consisted not only online questionnaires but also some light materials such as reading material and monitoring tool to evaluate the effectiveness of learning strategies by students. It was decided that REDI-Space should contain online questionnaires, room discussions, reading

materials, learning journals, and messages. This website can be accessed by students and lecturers. Regarding address descriptive statistics, there is information on gender, grade, and subject about those who accessed this website. There are four scales prepared, namely Self-Regulation, Emotional Support, Achievement Motivation, and Help-Seeking Behaviour. In this study, the participants were given Emotional Support Scale and Achievement Motivation Scale. REDI-Space can be accessed through www.redi-space.net. Figure 1 shows the homepage of REDI-Space.

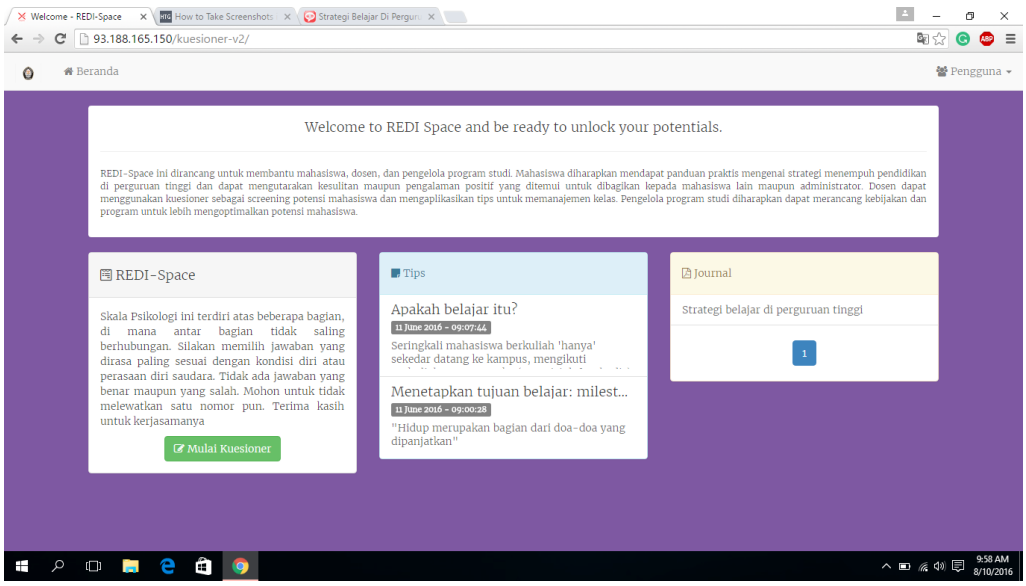

Figure 1. REDI-Space Homepage

Instrument Development and Initial Validation of Emotional Support Scale

Factor Analysis. Exploratory Factor Analysis (EFA) was conducted to examine construct validity using the principal component analysis method of extraction. According to Hair, Black, Babin, and Anderson (2010), varimax rotation is the best method to catch orthogonal rotation. Then, varimax was examined for correlation among factors with eigenvalues, prior to rotation, greater than or equal to one. An item was included as loading significantly on a factor if its factor value was greater than or equal to ± .50. First of all, Bartlett's Test of Sphericity with x^2 (45) = 549.047, $p < .05$ and Kaiser-Meyer Olkin (KMO) = .833, $p < .05$ showed that the factor analysis can be continued. In addition, Table shows the anti-image correlation between items described that all the items had value above .50.

Table 1
Anti-image correlation Emotional Support items

	PC1	PC2	PC3	PC4	LS1	LS2	LS3	LS4	LS5	LS6
PC1	.907a									
PC2	-.207	.834a								
PC3	-.068	-.169	.751a							
PC4	-.032	-.313	-.290	.783a						
LS1	-.154	.048	-.061	-.105	.822a					
LS2	-.106	-.009	.075	.044	-.423	.806a				
LS3	-.055	-.048	.002	-.038	-.086	-.145	.883a			
LS4	-.017	-.051	-.188	.142	-.204	-.016	-.174	.816a		
LS5	-.045	-.097	.038	-.079	-.063	-.196	.069	-.067	.858a	
LS6	-.093	-.111	.092	-.161	-.094	-.065	-.087	-.071	-.291	.867a

Table 2
Factor loading for ten Emotional Support items in the Final Factor Analysis

Item	Factor	
	1	2
PC1	.508	.404
PC2	.260	.745
PC3	.027	.738
PC4	.180	.789
LS1	.776	.156
LS2	.801	.001
LS3	.562	.082
LS4	.550	.114
LS5	.601	.243
LS6	.605	.317

Note: PC= positive climate, LS= lecture sensitivity

From the final factor analysis in Table 2, it could be stated that all the items had a significant loading although the item PC1 had been removed to another factor. Afterwards, the researcher named these factors the positive climate consisting of three items, while lecture's sensitivity contained seven items. The result of varimax rotation showed each factor had a value of more than .08. To sum up, two factors could be accepted as emotional support subscales. Upon extraction, the two factors accounted for 50.38% of the total variance measured variable (see Table 3 for the eigenvalues and percentage of variance).

Table 3
Eigenvalues and Percentage of Variance Accounted for by the Two Factors in the Final Factor Analysis (N = 216)

Factor	Initial eigenvalues		Extraction sums of squared loading		Rotation sums of squared loading
	Total	% Variance	Total	% Variance	Total
1	3.729	37.287	3.729	37.287	2.950
2	1.309	13.092	1.309	13.092	2.088

Reliability. From the Alpha Cronbach shown in Table 4, each subscale had a sufficient internal consistency and in total, Emotional Support Scale depicted adequate internal consistency with Cronbach's $\alpha > .80$. In general, ten items had item-total correlations above $r = .30$ ranged from $r = .338$ to $r = .618$.

Table 4
Descriptive Statistic for Emotional Support Scale

	Mean	Variance	SD	α
Positive climate	19.41	4.429	2.105	.677
Lecture sensitivity	27.57	11.176	3.343	.757
Total	46.99	22.925	4.788	.805

Instrument Development and Initial Validation of Achievement Motivation Scale

Factor Analysis. Quite similar to the previous scale, Achievement Motivation Scale used EFA by running the principal component analysis method of extraction. The first indicator was the value of Bartlett's Test of Sphericity with x^2 (66) = 630.223, $p < .05$ and Kaiser-Meyer Olkin (KMO) = .757, $p < .05$ showed that factor analysis fulfilled the requirement. In turn, anti-image correlation amongst the items described that all the items had the value above .50.

Table 5
Anti-image correlation Achievement Motivation items

	MG1	MG2	MG3	MG4	MG5	PAP1	PAP2	PAP3	PAP4	PAV1	PAV2	PAV3
MG1	.731a											
MG2	-.119	.749a										
MG3	-.239	.044	.814a									
MG4	-.150	-.133	-.131	.807a								
MG5	-.152	-.141	-.114	-.038	.728a							
PAP1	-.204	-.107	.028	-.188	-.028	.806a						
PAP2	.104	.043	-.161	.084	-.159	-.348	.773a					
PAP3	-.018	-.014	-.056	-.047	-.016	-.292	-.019	.824a				
PAP4	.018	.017	-.028	-.063	.144	-.190	-.124	-.313	.841a			
PAV1	.123	.087	-.024	-.103	.016	.007	-.172	-.250	-.127	.808a		
PAV2	-.090	.050	-.004	-.142	.094	-.021	.076	.001	.021	-.163	.519a	
PAV3	.112	-.015	.040	.187	.025	.013	-.093	-.111	.027	.061	-.571	.513a

Note: a Measure Sampling Adequacy (MSA)

As for item selection, factor loadings of .40 and higher were considered as significant. In other words, items with loading below .40 on all the factors were excluded from further analysis (Yong & Pearce, 2013). On the basis of this criterion, no items were excluded. The final result after the varimax rotation is shown in Table 6. It can be concluded that three factors precisely describe all the items. All the factors were named mastery goal, performance approach, and performance avoidance orderly. However, the results of component transformation matrix showed that only factor (mastery goal) achieved the value more than .80 although the two other factors were still adequate. It should be considered as the critical point for the next research suggestion.

Table 6
Factor loading for 12 items Achievement Motivation Scale in the Final Factor Analysis

Item	Factor		
	1	2	3
MG1	.066	.760	.002
MG2	-.068	.605	.003
MG3	.294	.507	-.052
MG4	.353	.561	.005
MG5	-.002	.578	-.168
PAP1	.706	.396	.027
PAP2	.682	.113	-.032
PAP3	.780	.149	.130
PAP4	.781	.029	-.006
PAV1	.699	-.108	.135
PAV2	.106	.013	.890
PAV3	.039	-.166	.853

It can be concluded that three factors considered for 54.76% of the total variance measured variable (see Table 7 for the eigenvalues and percentage of variance).

Table 7
Eigenvalues and Percentage of Variance Accounted for by the Three Factors in the Final Factor Analysis (N = 216)

Factor	Initial eigenvalues		Extraction sums of squared loading		Rotation sums of squared loading
	Total	% Variance	Total	% Variance	Total
1	3.376	28.137	3.376	28.137	2.903
2	1.955	16.288	1.955	16.288	2.081
3	1.241	10.339	1.241	10.339	1.587

Reliability. By conducting the Alpha Cronbach to examine internal consistency in Table 8, it indicated that the total items had sufficient internal consistency although performance avoidance reached the lowest internal consistency with Cronbach Alpha less than .60 compared to the subscale items. Item-total correlations ranged from $r = .112$

to r = .623. There were three items with item-total correlation less than .30. In turn, it indicated that future research needs to consider the number of subjects and various backgrounds.

Table 8
Descriptive Statistic for Achievement Motivation Scale

	Mean	Variance	SD	α
Mastery approach	25.09	5.476	2.340	.614
Performance approach	19.06	10.109	3.179	.793
Performance avoidance	11.20	6.988	2.643	.569
Total	55.34	31.836	5.642	.718

DISCUSSION

The results of this study offer promising support for REDI-Space application. Unfortunately for Emotional Support Scale, one of the dimensions (positive climate) has internal consistency that is questionable (.677) although it shows an internal consistency reliability that is generally acceptable (.70 or higher). Positive climate, which consists of three items, urgently needs a bigger number of participants to estimate its validity. In a research by Goodenow (1993), Students' Perception of the Teacher Emotionally Supportive Scale that consisted of three items was applied to 8971 students to show a high internal consistency (.80). For Goodenow, it was not important to divide teacher's support into several dimensions. Compared to Goodenow, it can be concluded that the number of participants in the present work was rather limited.

Furthermore, Achievement Orientation Scale yields similar results. Although generally its internal consistency can be accepted (.718), both mastery approach and performance avoidance approach showed questionable internal consistencies (.614) and (.569). The study by Roussel, Elliot and Eltman (2011) involving 551 students managed to attain an acceptable internal consistency for each subscale. Mastery approach goals reached (.94), performance approach goals had (.88), and performance avoidance goals had (.86).

The subjects involved did not capture various cultures in proportional number, in which for this variable, culture plays a significant factor (Ormrod, 2010). Therefore, these scales cannot be used in a wide population yet. There need to be many more subjects to confirm the structure in various cultural backgrounds.

Despite the weakness of this result, REDI-Space is the first website in self-regulation field that portrays not only description of academic self-regulation but also other variables that predict influencing self-regulation itself, particularly in Indonesia. In addition, it contains valuable

learning sources and tools to help students and lecturers in monitoring their learning relationship. Therefore, utilising this website can help in achieving academic goals.

CONCLUSION

It can be concluded that both Emotional Support and Achievement Motivation Scales can be categorised as valid and reliable scales. However, due to the questionable internal consistency for several aspects, it seems that the validation should be strengthened by adding bigger and more various subjects for the next research. A group of new participants can be proposed for test-retest reliability and also to increase construct validity across not only through the number of universities but also cultural background. In addition, REDI-Space as the first website self-regulation in Indonesia can be promoted to other universities through the use of bigger number of participants who are willing to get involved.

Thus, it is recommended that in order to establish adequate structure and validation of Indonesian Self-Regulation Scales for Adolescence (ISRSA), researchers would collect data from other areas in Indonesia considering cultural background and subject selections, particularly in the Achievement Motivation Scale that had lower item-total correlations and affected internal consistency. This effort will increase generalisation and bolster this scale as part of ISRSA.

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