

Psychometric Properties of Self-Regulating Climate Questionnaire: Comparison of Self-Regulatory Climate in Gifted and Public Schools

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Abstract

The purposes of the present study were to determine the psychometric properties of the self-regulatory climate questionnaire among an Iranian sample and comparing the self-regulating climate between gifted and public schools. The findings showed that self-regulatory climate questionnaire had proper internal consistency for subscales and total scale. Also, the fitness indices obtained from confirmatory factor analysis revealed that the scale had proper construct validity and all items had an appropriate load factor. Also, our results showed the gifted schools have a higher self-regulation climate. In general, the results of the present study supported the usefulness of the self-regulatory climate questionnaire among the Iranian sample and provided some evidence of the role of characteristics of the gifted schools in the self-regulatory climate.

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Abstract

Researchers have defined self-regulation environments as a set of normative conditions created through student-teacher interactions that can meet the psychological needs of student. The purposes of the present study were to determine the psychometric properties of the self-regulatory climate questionnaire among an Iranian sample and comparing the self-regulating climate between gifted and public schools. The statistical population included the first-year high school male students in gifted and public schools in 2018. In the first study, 200 students were selected through random sampling. In the second study, 30 students were randomly assigned to each group via a purposive sampling method. We used the self-regulatory climate questionnaire to collect data. We evaluated the reliability of the questionnaire by Cronbach's alpha and to test its validity, we used confirmatory factor analysis. To test the research hypothesis, multivariate analysis of variance was used. The findings showed that self-regulatory climate questionnaire had proper internal consistency for subscales and total scale. Also, the fitness indices obtained from confirmatory factor analysis revealed that the scale had proper construct validity and all items had an appropriate load factor. Also, our results

showed the gifted schools have a higher self-regulation climate. In general, the results of the present study supported the usefulness of the self-regulatory climate questionnaire among the Iranian sample and provided some evidence of the role of characteristics of the gifted schools in the self-regulatory climate.

Keywords: Self-regulatory climate, Validity, reliability, gifted schools

Introduction

Learning is at the heart of the school and both of teachers and students focus on it. The study of cognitive and motivational variables related to learning has been a subject of many studies (Paloş, Munteanu, Costea, & Macsinga, 2011). One of the structures that affect the learning is self-regulation. Studying the relationship between self-regulation and academic achievement is important because identification of effective learning factors is a valuable target for many studies (Connor et al., 2010; McClelland and Cameron, 2011). Self-regulation is defined as the ability to regulate thinking, behavior, and emotions, and is a kind of control mechanism that enables person to manage his attention, emotion, behavior and cognition to engage in purposed activities such as learning (Connor et al., 2016). A lot of Research evidence have supported of the role of self-regulation in academic achievement and has been referred to it as a critical factor in learning (Connor, et al., 2016; Wibrowski, Matthews, & Kitsantas, 2017; Zee and de Bree, 2017). Zimmerman (2002) considers self-regulation as a process which learners transform their mental capabilities into functional skills in the academic field. Students who are self-regulate, regulate their goals, and then select appropriate strategies related to them. These students monitor themselves during the learning process, and their motivation increases with learning progress.

An important challenge in the area of self-regulation is the measurement of this structure. A number of questionnaires have been developed to measure the self-regulation. The Motivated Strategies for Learning Questionnaire is one of these questionnaires, which is composed of

two main sections of learning and motivation strategies. The questionnaire measures self-regulation with the items in the learning strategies section (Pintrich, Smith, Garcia, & McKeachie, 1993). Another questionnaire used to measure self-regulation is the Learning and Study Strategies Inventory, which assess skill, will, and self-regulation strategies (Weinstein, Palmer, & Schulte, 1987). Self-Regulated Learning Interview Scale is another tool that as a structured interview, measures self-regulation learning strategies (Zimmerman and Pons, 1986). Along with these studies, some efforts have been made to measure self-regulatory learning with more recent methods, such as the use of an elaborate think-aloud method (Azevedo and Cromley, 2004).

Most of efforts to measure self-regulation have focused on assessing individual self-regulation strategies of learners. A new research trend is measurement of collective self-regulation climate rather than individual self-regulatory. Self-regulation climate is based on self-determination theory. Self-determination theory explains the intrinsic motivation of individuals in pursuing their goals and their efforts to increase their potential (Deci and Ryan, 2008). We recognize the difference between students facing challenges and those who are reluctant and unmotivated, based on self-regulation capacities (Schunk and Zimmerman, 2012). The self-regulatory climate emphasizes the effect of school social environment on the student self-regulation. Niemiec and Ryan (2009) argue that when the social environment of people ignores their psychological needs, they tend to work below their capacity, and when their social environment satisfies their psychological needs, they increase their functions.

In accordance to Adams, Ware, Miskell, & Forsyth (2016), we define the self-regulation learning climate as a set of normative conditions based on teacher-student interactions so can address the psychological needs of students, including autonomy, relatedness, and competence. Evidently, the formation of a self-regulation learning climate in students is related to the environmental conditions of a school (Adams, et al., 2016). Some studies have

indicated the difference in self-regulation between gifted and public students, and have shown that high-intelligence students have a higher self-regulation capacity (Greene, Moos, Azevedo, & Winters, 2008; Ruban and Reis, 2006). But according to our search, there is no comparison between gifted and public schools in the context of self-regulation climate.

The self-regulation learning climate mainly reflects the social environment governing the learning environment and the teacher-student interaction at a school. The need for an appropriate tool for carrying out research related to self-regulation climate, lack of a self-regulatory climate questionnaire in Persian language and the necessity of validation this scale in accordance to Iranian culture were our incentives for doing this research. In the first study we have investigated the psychometric properties of self-regulatory climate questionnaire and in the second study we have examined the differences in the self-regulatory climate between public and gifted schools.

Method

Participants

Our study was performed into two sections. In the first section, we have assessed the psychometric properties of self-regulated questionnaire. To this aim, 200 male high school students were selected via random sampling. In the second section and to compare gifted and public schools in self-regulated climate, we have selected 30 students from each one of gifted and public schools via purposive sampling.

Procedure

Participants were recruited from schools in a city of Iran. They completed a self-reported questionnaire. Participation were informed about the nature of the study, that participation was voluntary and anonymous, that they could withdraw from the study at any time, and that they were not obliged to respond to all questionnaire items. Also, the research plan was approved by the Ethics Committee of the university. We perform a confirmatory factor

analysis to confirm the structure of self-regulatory climate questionnaire. Also, the MANOVA test was used to compare gifted and public schools in self-regulated climate and its components.

Measure

Participants were asked to complete the Adams, Forsyth, Dollarhide, Miskell, & Ware (2015) self-regulated climate Scale. This scale consisted of 15 questions and 3 subscales. The scale had a 5-point Likert-type response set ranging from 1 (strongly disagree) to 5 (strongly agree). Higher total scores indicate more self-regulated climate. Psychometric characteristics of this scale are well-documented in original study (Adams, et al., 2015). Adams, et al. (2015) showed that structural equation modeling support the theory that collective faculty trust in students, collective student trust in teachers, and student-perceived academic emphasis combine to form a self-regulatory climate. Also, they reported high Cronbach's alpha for Faculty trust in students, Student trust in teachers and Student-perceived academic emphasis (0.97, 0.91 and 0.83 respectively).

In the current study, following a back-translation method, all items were translated into Persian by an English translator. Then, another translator translated all items back into English. Finally, the authors confirmed the final version of the questionnaire. The reliability of the full scale and subscales was evaluated by Cronbach's Alpha coefficient, and the validity of it was examined by confirmatory factor analysis.

Results

Before the analysis, we checked the normality of data by the Kolmogorov-Smirnov test, and its result confirmed normality of data. Analysis was performed using the SPSS software version 16, and the AMOS software version 16. The correlation matrix and descriptive statistics (mean and standard deviation) of the factors of the self-regulated climate

questionnaire, namely collective faculty trust in students, collective student trust in teachers, and student-perceived academic emphasis are presented in Table 1.

Table1. The correlation matrix and descriptive statistics (mean and standard deviation)

A confirmatory factor analysis, along maximum likelihood estimation was performed to confirm the structure of self-regulated climate scale. The values of fitness indicators show that the model benefits from good fitness. The outcome of confirmatory factor analysis indicates that RMSEA equal to 0.061, CFI was 0.94, GFI was 0.91, AGFI was 0.88, NFI was 0.88, IFI was 0.94, TLI was 0.93 and χ^2/df was 1.73 of which demonstrated a good fit with observed data. Factor loadings for the scale items were presented in Table 2. According to table 2, coefficients of all items were above 0.30.

Table 2. The confirmatory factor analysis on self-regulated climate items

Cronbach's alpha was used for the evaluation of the reliability of the scale and its subscales. Reliability for the total scale, collective faculty trust in students, collective student trust in teachers, and student-perceived academic emphasis obtained 0.86, 0.70, 0.87, and 0.78 respectively.

A one-way multivariate analysis of variance was run to determine the effect of school type (public or gifted) on self-regulated climate. Before the analysis, we checked the MANOVA assumptions include normality; equality of variance, Absence of multivariate outliers, Linearity, Absence of multicollinearity and Equality of covariance matrices and no violation was observed. Three measures of self-regulated climate were assessed: collective faculty trust in students, collective student trust in teachers, and student-perceived academic emphasis. Data are expressed as mean and standard deviation in table 3. The students of gifted school scored higher in three measures of self-regulated climate. The MANOVA results were presented in table 4.

Table 4. Results of MANOVA three measures of self-regulated climate

The differences between the schools on the three variables was statistically significant, $F(3, 56) = 83.99$, $p < .0001$; Wilks' $\Lambda = 0.182$; partial $\eta^2 = 0.82$. Follow-up univariate ANOVAs results were presented in table 5.

Table 5. Results of Follow-up univariate ANOVAs

Follow-up univariate ANOVAs showed that three variables scores (collective faculty trust in students, $F(1, 58) = 86.84$, $p < .0001$; partial $\eta^2 = 0.60$), (collective student trust in teachers, $F(1, 58) = 39.6$, $p < .0001$; partial $\eta^2 = 0.40$) and (student-perceived academic emphasis, $F(1, 58) = 73.94$, $p < .0001$; partial $\eta^2 = 0.56$) were statistically significantly different between the gifted and public schools.

Discussion

The purpose of this study was to evaluate the psychometric properties of self-regulated climate scale and to compare the public and gifted schools in self-regulated climate. In general, according to the results, the questionnaire is suitable for measuring self-regulated climate. The evidence obtained from carrying out the confirmatory analysis revealed that the factor structure of the Persian version of self-regulated scale is consistent with the original version. Also, the reliability coefficients for all factors and the total questionnaire were higher than 0.70, which indicates the good reliability. The results are in line with studies that examine the validity and reliability of this scale (Adams, et al., 2015) .

According to confirmatory analysis the *Faculty trust in students* factor explained approximately 54% of the self-regulatory climate variance. Faculty trust accelerates autonomy-supportive structures and activities. Low trust requires tight controls that rely on external factors to regulate behavior (Forsyth, Adams, & Hoy, 2011). Adams, et al. (2015) believe student trust and academic emphasis somewhat depend on high faculty trust. Self-regulatory climate greatly depend on interactions and commitments between teachers and

students. Faculty trust reflects the teacher's role in this interaction. Faculty trust facilitates students' engagement in academic activities and increase students motivation.

According to the self-determination theory, teachers with high faculty trust use student-centered instructional approaches, engage students in learning through non-controlling language, persuade choice in the selection of tasks and projects, and allow for autonomous thinking (Black and Deci, 2000; Hardre and Reeve, 2003; Ryan and Deci, 2016; Soenens and Vansteenkiste, 2005).

Results also indicated the student trust in teachers' factor explained about 75% of the self-regulatory climate variance. According to the related literature, this component is rooted in a relational environment (Reeve, Ryan, Deci, & Jang, 2008). Relational support develops through student–teacher interactions that produce strong student attachments to teachers and to learning activities (Ryan and Deci, 2016). The students trust in teachers motivates students to think purposive and consider school and academic activities as a tool to achieve goals. Adams, et al. (2015) believe a climate of relational support exists when there is student trust in teachers. Student trust is an indicator of students' connection sense to teachers and facilitates the learning activities. Mitchell, Kensler, & Tschannen-Moran (2018) indicated student trust in teachers related to student identification with school. Student identification with school, in turn, more highly associated with academic motivation.

Our results revealed the third components, namely student-perceived academic emphasis explained near the 30% of the self-regulatory climate variance. Along with the original study, the least amount of variance accounted by this component. According to Adams, et al. (2015) student-perceived academic emphasis is rooted in a climate of competence support. Goddard, Sweetland, & Hoy (2000) believe academic emphasis refers to a school climate where students perceive high academic expectations from teachers and peers, and believe the collective effort of the school encourages students to achieve academic goals. High academic

emphasis leads to high academic expectations, encouraging students to work hard in class, and celebrating academic excellence (Hoy, Tarter, & Hoy, 2006). The social cognitive theory, as a theoretical framework explains the development and effect of academic emphasis on student achievement. According to this theory, in schools with high academic emphasis, due to agency, vicarious learning, and self-regulation, teachers and students try harder to enhance academic achievement (Martin, 2004).

Also, our results indicated the gifted schools have a higher self-regulation climate than public schools. Our results is relatively consistent with results of other studies (Greene, et al., 2008; Ruban and Reis, 2006). These studies indicated the gifted students use more sophisticated self-regulatory strategies; but as we mentioned earlier, we didn't find studies to compare gifted and public schools in the context of self-regulation climate.

One of probable explanations for this difference is the different structure and policies in gifted schools in comparison to public schools in Iran. The gifted schools in Iran benefit of some advantages. Teachers of these schools usually are the genius and they have high academic qualification levels such as master and PhD degrees. This issue caused they have a good and qualified interaction with students. In this case, we can observe Faculty trust in students' component of self-regulated climate. Also, the gifted schools are committed to have some policies that enhance the academic learning. These schools are expected to have best performance in high stakes tests and this expectancy are transferred to students. Hence, students perceived high academic emphasis and in turn it encourages the self-regulated climate. In the case of student trust in teachers' components, we consider the relationship of this component with the first component. In other words, when teachers offer some interactions with their students, as a result, the students have a sense of trust in teachers too.

Research Contributions and Future Directions

This study is the first one to evaluate psychometric properties of self-regulating climate questionnaire in Iran. Also, the current study is one of few studies that have conducted to compare gifted and public schools in self-regulated climate. Researchers and practitioners can study some correlations of this construct using this questionnaire. Our results obviously revealed the gifted schools are higher than public schools in self-regulated climate. It is recommended based on the current research results, some interventions should be designed to make more self-regulated climate of public schools.

Limitations

Along with the results, the present study has been accompanied by limitations that the barriers related to gathering data tool and the study sample attributions are the most important of these limitations. First, this scale should be used as one of the information sources about self-regulated climate along with other measurements. Also, despite the good psychometric properties, this scale is still a self-report questionnaire, and hence its results should be interpreted with caution.

Finally, the sample is limited to the first-year high school male students, which can limit the generalization of the findings. Therefore, it is suggested that the psychometric properties of the questionnaire be examined in other samples of different age and educational levels. Also, the validity of this questionnaire has been evaluated by the use of one method (factor analysis). Therefore, future studies could evaluate the validity of it with other methods of evaluating validity. The findings in the present study contribute to the growing literature on self-regulated climate and help to broaden this construct as well.

Conclusion

In general, the self-regulated questionnaire is an appropriate tool that can be used in Iran due to the excellent validity and reliability and can be used in screening, research and educational

situations. This tool is one of the most useful tools available to study the various aspects of self-regulated climate as far as researchers who have the interest are concerned.

Declaration of Conflicting Interests

The authors declared no potential dispute of interest concerning the research, authorship, and/or publication of this article.

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Table1. The correlation matrix and descriptive statistics (mean and standard deviation)

| Variable | Faculty trust in students | Student trust in teachers | academic emphasis | Mean | SD |
|---------------------------|---------------------------|---------------------------|-------------------|-------|-------|
| Faculty trust in students | 1 | | | 12.28 | 5.36 |
| Student trust in teachers | 0.61** | 1 | | 11.38 | 4.61 |
| Academic emphasis | 0.47** | 0.68** | 1 | 9.64 | 4.22 |
| Self-regulated climate | 0.84** | 0.89** | 0.82** | 33.30 | 12.07 |

** Significance level: 0.01 * Significance level: 0.05, N= 200

Table 2. The confirmatory factor analysis on self-regulated climate items

| Factors | Faculty trust in students | Student trust in teachers | Academic emphasis |
|---------------|---------------------------|---------------------------|-------------------|
| % of Variance | 54 | 75 | 29 |
| Items | Factor Loadings | | |
| 1 | 0.62 | | |
| 2 | 0.66 | | |
| 3 | 0.35 | | |
| 4 | 0.53 | | |
| 5 | 0.63 | | |
| 6 | | 0.79 | |
| 7 | | 0.79 | |
| 8 | | 0.76 | |
| 9 | | 0.77 | |
| 10 | | 0.68 | |
| 11 | | | 0.51 |
| 12 | | | 0.77 |
| 13 | | | 0.70 |
| 14 | | | 0.71 |
| 15 | | | 0.50 |

N= 200

Table 3. Mean and standard deviation of research variables

| Variable | School | Mean | Std. Deviation | N |
|---------------------------|--------|-------|----------------|----|
| Faculty trust in students | gifted | 16.30 | 1.84 | 30 |
| | public | 12.23 | 1.52 | 30 |
| | Total | 14.26 | 2.64 | 60 |
| Student trust in teachers | gifted | 15.13 | 1.77 | 30 |
| | public | 12.23 | 1.81 | 30 |
| | Total | 13.68 | 2.30 | 60 |
| Academic emphasis | gifted | 14.50 | 1.16 | 30 |
| | public | 11.83 | 1.23 | 30 |
| | Total | 13.16 | 1.79 | 60 |

Table 4. Results of MANOVA three measures of self-regulated climate

| Effect | Test | Value | F | DF Hypothesis | DF Error | Sig. | Partial Eta |
|--------|--------------------|-------|-------|---------------|----------|-------|-------------|
| School | Pillai's Trace | 0.81 | 83.99 | 3 | 56 | 0.001 | 0.82 |
| | Wilks' Lambda | 0.18 | 83.99 | 3 | 56 | 0.001 | 0.82 |
| | Hotelling's Trace | 4.49 | 83.99 | 3 | 56 | 0.001 | 0.82 |
| | Roy's Largest Root | 4.49 | 83.99 | 3 | 56 | 0.001 | 0.82 |

Table 5. Results of Follow-up univariate ANOVAs

| Effect | Dependent variable | F | Sig. | Partial Eta |
|--------|---------------------------|-------|-------|-------------|
| School | Faculty trust in students | 86.84 | 0.001 | 0.60 |
| | Student trust in teachers | 39.16 | 0.001 | 0.40 |
| | Academic emphasis | 73.94 | 0.001 | 0.56 |