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Effect of a Teacher Autonomy Supportive Social Emotional learning (TAS-SEL) Intervention on Adolescents' Mental Health

[1]*Wu Deli,**Rosna Awang-Hashim, ***Amrita Kaur

ABSTRACT---*The main objective of this article is to investigate the effect of teacher autonomy supportive social emotional learning (TAS-SEL) program and a regular social emotional learning (SEL) program based on Strong Kids' curriculum for rural junior high boarding school for knowledge, learning anxiety and dropout intention. The quasi-experiment research design was selected in order to compare the intervention effect among three groups on participants' Strong Kids knowledge, learning anxiety and dropout intention, including TASSEL intervention group, SEL intervention group, control group, each group had fifty-one participants. The Strong Kids knowledge test and learning anxiety and dropout intention were administered to evaluate the SEL knowledge, students' learning anxiety and students' dropout intention before and after the program. Each program was a twelve-session program, each lesson lasted 45 minutes. The findings of the study show that TASSEL and SEL intervention improve the Strong Kids knowledge and reduce learning anxiety, but only TASSEL intervention reduce dropout intention, which demonstrated the importance of teacher autonomy support in delivering SEL intervention on reducing dropout intention. It was concluded that the TASSEL intervention program can be delivered in an educational setting with minimal professional training and resources, while the positive outcome can be observed in a short period of time. Additionally, supportive teaching is effective tool to reduce the dropout intention when combined with SEL intervention whereas, learning anxiety has no direct linkage with dropout intention.*

Keywords---*Adolescents, Teacher autonomy supportive, SEL Intervention, Learning Anxiety, Dropout Intention*

I. INTRODUCTION

The main objective of Social Emotional Learning (SEL) is to develop the students' social emotional competences with self-awareness, self-management, social awareness, interpersonal skills and responsible decision-making that reduce students' negative mental symptoms which boost positive behaviors (Carrizales et al., 2016). In modern era SEL interventions are used for collaboration and proactive mind up solutions. Moreover, Strong Kids one of SEL interventions which have been recognized to be cost-effective and easy to implement (Webster-Stratton, 2004; Maloney, 2016; Greene's, 2016). Cognitive and behavioral theories mostly based on cognition, behaviorism and positive psychology. These theories suggested that an individual's behavior can be changed if there are cognition changes and if individuals view the outside world in a positive way, it will motivate them to do a better job in various circumstance (Kroese,1997). The Strong Kids curriculum contains a lot of positive cognition knowledge both in study. Moreover, increasing the existing knowledge improve the ability and skills for the students to face the daily routine problems efficiently especially the adolescent psychological problems such as; anger control, self-control and responsible decision-making, resilience, which can be helpful

*wu_deli@ahsgs.uum.edu.my, ** rosna@uum.edu.my, ***amrita@uum.edu.my
[1] Beibu Gulf University [2-3] Universiti Utara Malaysia

to ease their mental health problems like learning anxiety and condense the thought of considering dropout of school (Merrell, 2010). Additionally, SEL intervention has been used as an intervention to minimize learning anxiety and dropout by Wang (2016). In their research, Wang (2016) stated that the it is an important tool which reduced learning anxiety by 2.3%, and dropout 1.6%, while the real dropout rate is ten times high, and the Chinese government pay a lot of attention and effort to reduce dropout of rural junior high school students (MoE, 2008, 2010, 2011, 2012). Hence, there is an urgent need to implement SEL in order to provide better intervention effect on students' dropout intention. However, there is seldom research focus on how to deliver SEL to improve its effect.

Reeve and Jang (2006) identified that there are 11 teacher autonomy supportive instruction behaviors, such as; asking what students want, provide students time to learn in the way which they like, applauding as feedback, explaining reasons, providing encouragement, and offering clues. Reeve and Deci (2010) found that teacher autonomy support set a warm and democratic environment for students to learn and improve the engagement. Harlacber and Merrell (2010) posited that praise and positive feedback is an effective tool for the improvement of students' SEL knowledge and usage of SEL skills. Furthermore, Jang, Reeve and Halusic (2016) suggested that watching video clips and whole-group discussion is also beneficial for the satisfaction of students' autonomy need and enhancement of their learning results. Reeve (1998) found that teacher autonomy support is teachable. Cheon (2018) implemented Autonomy Support Intervention Program (ASIP) in order to train teachers' autonomy and supportive teaching styles. ASIP proposed three steps; firstly, to inform teachers about the importance of autonomy support teaching in class. Secondly, to illustrate skills on how to use teacher autonomy supportive instructions in class, such as give structure about the study, praise as information feedback, provide rationales, offering encouragement and offering hints. Thirdly, to ask teachers for sharing their own experience by using teacher autonomy supportive instruction behaviors in their class and the difficulties they face in delivering teacher autonomy supportive instructions.

Based on the teacher autonomy supportive instruction behaviors from Reeve and Jang (2006) and the Chinese culture context, warm up activities chosen by students, give structure about each lesson, explain key terms and definitions according to Chinese culture, use examples based on students' own experience, activities according to each lesson (Give rational and appraise on activities according to each lesson), group work for homework and free conversation (emotional communication between students and teacher). These six teacher autonomy supportive instruction behaviors were added to original Strong Kids curriculum to elasticity students' autonomy, association and competency and also consider of culture adaptions.

Hetrick (2018) found that there is an excessive need to modify the SEL intervention for the students' engagement in order to get the favorable outcome. Reeve et al (2004) revealed that teacher autonomy support was effective to reduce the dropout rate. However, it has not been put into consideration and also delivering SEL in teacher autonomy supportive way in order to retain dropout rate has not shown positive indicators. Hence, it raise the desire for the researcher to conduct the new research to clarify the real issues related teacher autonomy support that is helpful to assemble existing SEL intervention. Especially, Strong Kids' intervention that is obliging to overcome learning anxiety and dropout intention. In this study, dropout intention was used, instead of dropout rate because of the time limitation and the previous research conducted by Hardre and Reeve (2003), Vallerand (1997) have robust evidence that dropout intention can predict the real dropout rate in one year.

II. RESEARCH QUESTIONS

1. Is there any significance difference between pre-intervention and post-intervention scores of Strong Kids Knowledge among TASSEL intervention group, SEL intervention group and control group?

2. Is there any significance difference between pre-intervention and post-intervention self-ratings of students' learning anxiety among TASSEL intervention group, SEL intervention group and control group?

3. Is there any significance difference between pre-intervention and post intervention of students' dropout intention among TASSEL intervention group, SEL intervention group and control group?

III. METHODOLOGY

The main objective of this study is to compare participants' Strong Kids knowledge, learning anxiety and dropout intention of a teacher autonomy supportive adapted TASSEL intervention, SEL intervention and control group on rural junior high school students. A quasi-experimental research design was used for this study. The participants of the study were Grade 8 junior high school students who have problem in social and emotional management, especially high intention of dropout of school from a rural boarding school located in districts of rural Southwest of China. The lessons were conducted in the rural public junior high boarding school. Whereas, total of 153 (N = 153; 51 each group) students were selected from three classes randomly assigned to TASSEL intervention group, SEL intervention group and control group.

The standardize questionnaire was adopted from (Carrizales Engelmann et al., 2016) based on social and emotional learning curriculum that has five dimensions such as; self-awareness, self-management, social awareness, interpersonal skills and responsible decision-making. Strong Kids is suitable for Grades 6 to 8. The course includes 12 classes; the time for every lesson lasts 35 to 50 minutes. Every class is taught in groups, usually starts with an introduction to the objectives of the day's course and a brief review of the course. Next, introduce the new vocabulary and skills, and guide the students through practical application practice. Through positive teacher guidance and immediate feedback, promote students' participation and engagement. Finally, homework is arranged to give students the chance to practice and review their skills independently. Titles and brief descriptions of each Strong Kids lesson are provided in Table 1.

Table. 1

Strong Kids Lessons

Lesson	Content
Lesson1: About Strong Kids: Emotional Strength Training	Curriculum overview, expectations for participation, and key terms
Lesson2: Understanding Your Feelings	Identifying basic emotions and Understanding how feelings can be Comfortable or uncomfortable
Lesson3: Understanding Your Feelings	Identifying appropriate ways of expressing Feelings
Lesson4: Understanding Other People's Feelings	Using physical cues to identify others' emotions
Lesson 5: Dealing with anger	Identifying anger and ways to control anger
Lesson6: Clear Thinking	Understand the influence of thoughts on emotions and behaviours, internal thought awareness, and common thinking traps that affect behavior, thoughts, and emotions

Lesson7: Clear Thinking	Develop the ability to notice or observe thoughts, discriminate from healthy and less helpful patterns
Lesson8: Solving People Problems	Learn ways to be aware of one's actions while maintaining a good attitude, distinguish between helpful and unhelpful decision-making strategies, identify and apply the steps of a problem- solving model to resolve conflicts
Lesson9: Letting Go of Stress	Understand different kinds of stress ways to proactively cope
Lesson10: Positive Living	Understand the value of positive choices
Lesson11: Creating Strong and SMART Goals	Goal setting and increasing positive activity as a way to a healthy life
Lesson12: Finishing up	A review of concepts and skills throughout the Curriculum

Moreover, using the recommendations of Reeve and Jang (2006) as a framework and based on our survey with Chinese students' context culture, the researchers implemented the Strong Kids intervention with teacher autonomy support behaviors. Each behavior and how it was addressed in the current study are summarized in Table 2.

Table. 2

Teacher Autonomy Support Strong Kids VS Original Strong Kids lesson for Chinese students

Minutes	**TAS Strong Kids (TASSEL)**	**Original Strong Kids(SEL)**
0-3	Warm up activities chosen by students	Review of last lesson
4-6	Review last lesson	Introduce the goal of new lesson
7-8	Introduce the structure and goal of new lesson	Mindfulness-Based Focusing Activity
9-13	Key terms and definition (explain according to Chinese culture , use example based on students' own experience)	Key terms and definitions
14-32	Activities according to each lesson (Give rational and appraise on activities according to each lesson)	Activities according to each lesson
33-38	Group work for homework	Putting it all together and Closure
39-42	Free conversation(emotional communication between students and teacher)	Tips for transfer training and Homework
43-45	Putting it all together and Closure	Homework Handouts (personal)

In this research, teacher autonomy supportive instruction behaviors include warm up activities chosen by students, give structure about each lesson, explain key terms and definitions according to Chinese culture, use example based on students' own experience, activities according to each lesson (Give rational and appraise on activities according to each lesson), Group work for homework, and Free conversation (emotional communication between students and teacher). These six teacher autonomy supportive instruction behaviors were added to original Strong Kids curriculum to compare the effect on rural junior high school students' SEL symptoms, SEL knowledge, Social-Emotional Skills, learning anxiety and dropout intention. Additionally, included cultural adaptations for rural junior high boarding school in Southwest of China, as Castro-Olivo (2014, 2016) has empirically identified the cultural adapting of SEL. In current study, based on our survey with teacher and students, we recognized that Chinese students do not feel comfortable with mindfulness activity, in the current

study, mindfulness activity was replaced by other activities, such as Guessing puzzles with Chinese idioms or psychological game like gale blowing to make students active and then focus on the study. Furthermore, because students have a lot of homework to do after school, and our intervention is an extra class burden for them already, so we did not ask students to do homework after school, instead, we asked students to finish the homework together in class.

IV. Measures

The questionnaire was translated into Chinese language in order to better understanding for the respondents. The validity was also conducted by some experts (professional psychological researchers).

SEL Knowledge

Strong Kids Knowledge Questionnaire. The 20 items self-report knowledge questionnaire is designed to be used to assess the knowledge of healthy social emotional and behavioural skills before and after the test, especially the concepts taught in the Strong Children's Course, which is adapted from Merrell et al. (2007). These items consist of true and false items and multiple selection items. Each item is scored correctly or incorrectly using the scoring keys provided in the course. Correct answer 1 point for each question, correct completion of all test questions up to 20 points. Examples include: marking right or wrong. "Self-esteem is your sense of value to yourself," multiple choices - "An example of uncomfortable emotions for most people is (a) excitement, (b) frustration, (c) curiosity, (d) content. The Strong Kids Knowledge Questionnaire has been used in several pilot studies (Feuerborn, 2004; Faust, 2006; Isava, 2006; Williams, 2013). Previous studies have shown that these 20 measures are sensitive to changes in knowledge among students participating in the project. Internal consistency reliability (Cronbach's alpha) ranges from 0.60 to 0.70, which is considered sufficient for a research measurement of this length.

Learning Anxiety

The study employed a variant of the Children's Dominant Anxiety Scale (CMA), known as the Learning Anxiety Index (Reynolds & Richmond, 1978). The Learning Anxiety Index (LAI) is the most widely used scale to measure the anxiety of primary school students in China. It consists of 15 questions raised by the Mental Health Test (MHT) (Gan, Bi & Ruan, 2007; Zhou, 1991). Each item uses a yes or no answer. Correct answer 1 point for each question, correct completion of all test questions up to 15 points. More than 7 points on this variable implies higher levels of learning anxiety. The reliability of LAI ranges from 0.84 to 0.88, and that of retest ranges from 0.78 to 0.86 (Yao et al., 2011). In the present study, the reliability of LAI is 0.83. The index was originally designed so that a score of more than 7 indicates a student's risk of learning anxiety. However, in the current study, the average score is 9, which allows us to construct a dichotomous variable equal to 1 for students whose score exceeds 9. The risk of learning anxiety means that students need to be evaluated and potentially treated by clinical psychologists.

Dropout Intention

Intentions to persist versus drop out test. This scale was used to test rural junior middle school students' intention to dropout (Hardre & Reeve, 2003). It includes three items to assess the willingness to stick to school dropout. Sample items are "I sometimes think about dropping out" and "I intend to drop out", "Sometimes I feel uncertain about continuing to study year after year." Each item uses a six point Likert scale from 1 (strongly disagree) to 6 (strongly agree). In the present study,

the reliability of Intentions to persist versus drop out test is 0.82. Vallerand et al. (1997) identified that dropout intention can forecast dropout behavior in one year, according to the time limitation, in the current research we used dropout intention instead of real dropout rate.

Exploratory factor analysis

In this research, Learning Anxiety and Dropout intention instruments were translated into Chinese. In order to confirm the reliability and validity of instruments, it is necessary to complete psychometric assessment such as exploratory factor analysis with translated items in the instruments (Arafat, Chowdhury, Qusar, & Hafez, 2016).

Factor analysis is a data reduction technique used to reduce a large number of variables to a smaller set of underlying factors that summarize the essential information contained in the variables. More frequently, factor analysis is used as a technique when the researcher wishes to summarize the structure of a set of variables. When the researcher's goal is to construct a reliable test, factor analysis is an additional means of determining whether items are tapping into the same construct. One of the most frequently used methods of factor extraction is Principal Components Analysis (PCA).

In this research, a principal components analysis (PCA) factoring extraction method and oblique rotation using varimax method were employed on the 15 items of learning anxiety. The factor extraction analysis of these items was forced to provide a two factors solution based on the definition of learning anxiety (Wang, 2015). The factor loadings of all items with absolute values of .40 and above (Reio & Shuck, 2015) were accepted as adequate items to constitute a meaningful and interpretable factor and contribute significantly towards explaining each of the learning anxiety constructs. As shown in Table 3, all items loaded on their designated factors with accepted loadings values ranging from .42 to .71, which provides an initial psychometric property and validity for subscales of the learning anxiety. The Kaiser-Mayer-Olkin (KMO) measure revealed a value of .89, which is above the threshold value of .70 (Leech, Barrett, & Morgan, 2005). Bartlett's test of Sphericity value was significant at $p<.05$ with 105 degrees of freedom, providing that the correlation matrix was not an identity matrix. Also, the two extracted factors accounted for 39.10% of the total variance. Therefore, it was considered appropriate to keep all items in the subscales of basic needs for the final study.

Table 3: Exploratory Factor Analysis for Learning Anxiety: Factor Loadings based on Principal Components and Varimax Rotation Method

	Factor 1	**Factor 2**
Items	School activity worry	Emotion distress
LA6	.71	
LA4	.60	
LA3	.58	
LA8	.57	
LA7	.57	
LA9	.57	
LA11	.54	
LA2	.54	
LA5	.52	
LA10	.51	

LA14		.71
LA15		.71
LA13		.56
LA12		.51
LA1		.42
Total.Eigenvalues	4.50	1.2
Percentage of variance explained	30.00	9.10
KMO	.89	
Bartlett's Test of Sphericity	*1797.97	
df	105	
Total variance explained	39.10	

Exploratory Factor Analysis for Learning Anxiety: Factor Loadings based on Principal Components and Varimax Rotation Method

*p<.05; N=153

Only loadings >.40 were displayed

Table 4 shows the one-factor solution for dropout intention using the principal components analysis (PCA) method of extraction and varimax statistical techniques. Based on the table, all three items loaded strongly on their targeted factor with loadings ranged from the minimum value of .84to the maximum value of .88; as well as exceeded the recommended cut-off value of .40. This analysis also showed that Kaiser-Mayer-Olkin (KMO) revealed a value of .71 with a degree of freedom of 3, and Bartlett's test of sphericity with a value of 633.89 was significant at p<.05; which provide evidence of sampling adequacy and correlation matrix is not an identity matrix. Besides, the percentage of the total variance of the factor explained by the subjected items is 73.94%. Hence, the whole items of this scale are valid and retained for the final analysis.

Table 4: Exploratory Factor Analysis for Learning Anxiety: Factor Loadings based on Principal Components and Varimax Rotation Method

	Factor 1
Items	Dropout intention
DOI1	.88
DOI2	.86
DOI3	.84
Total.Eigenvalues	2.22
Percentage of variance explained	73.94
KMO	.71
Bartlett's Test of Sphericity	* 633.89

df.	3	
	Total variance explained	73.94

Exploratory Factor Analysis for Dropout Intention: Factor Loadings based on Principal Components and Varimax Rotation Method

*p<.05; N=153

Only loadings >.40 were displayed

Procedures

We obtained school principal's consent to allow their students to join the teacher autonomy supportive intervention program. Students were recruited from rural junior high boarding school. In the current study, the specific school was chosen for research because it is rural junior high boarding school with students have high dropout rate, and they have mental health teacher and mental health class, while majority of the rural junior high school do not have mental health teacher or mental health class, which is convenient for the present intervention, as we use our intervention class to replace their mental health class. Recruitment took place in mental health class, as they have mental health class once a week, so this intervention is just to serve as their routine mental health class. The interventions were delivered by two mental health teachers, both are females, at the age of 25, and have two years' working experience. In this study, the researcher chose one teacher who got high score on autonomy based on the survey of General Causality Orientation Scale, and the other to implement SEL intervention. The mental health teachers were trained to deliver the intervention in teacher autonomy supportive way or in regular way follow the Strong Kids curriculum by the principal investigator in a 3 times training session. For the TASSEL intervention teacher, during the first session, the investigator gave some research articles about the importance and skills of teacher autonomy support used in classroom teaching. Then the investigator trained the teacher how to implement the teacher autonomy supportive behaviors in each class. The second session was to coach the teacher about the 12 lessons of Strong Kid curriculum lesson by lesson, and how to compile teacher autonomy supportive behaviours in Strong Kids lesson, and the third session was to have a discussion with the teacher after each class, to solve the obstacles she faced in delivering previous lesson and how to prepare the next lesson. For the SEL intervention teacher, there are two sessions training. The first session is to coach the teacher about the 12 lessons of Strong Kid curriculum lesson by lesson, and the second session is to have a discussion with the teacher after each class, to solve the obstacles she faced in delivering previous lesson and how to prepare the next lesson.

During the interventions, both the teachers were also given a fidelity checklist to check if they finish each lesson step by step, and the TASSEL teacher was given another fidelity checklist to check if she taught each lesson in a teacher autonomy supported way. There was also a vice-principal who was invited to check fidelity of SEL and TASSEL. According to the checklist of teachers and the vice-principal, both the teachers implemented the SEL intervention step by step, and the TASSEL teacher archived the requirement of teacher autonomy supportive teaching. One lesson was presented every day, and implementation spanned twelve days. During the course, students will be rewarded with oral praise if they actively participate in the course.

V. Data Collection and Analysis

There were pretest and posttest for data collection. The first time data collection was done before the intervention began. The participants were asked to fulfill the survey in their class room in 45 minutes. After 12-lesson intervention, there was a second time data collection with the same procedure. There are two data analysis methods used in this research. The first one is Paired sample t test. Paired sample t test was selected to compare the mean differences between pre-intervention and post-intervention. According to Agresti and Finlay (2009), in social and behavioral sciences, t tests are proper statistic method for this purpose. The second one is repeated measure ANOVA to compare the group difference on Strong Kids knowledge, learning anxiety and dropout intention. The third data analysis method is dichotomy to evaluate learning anxiety and dropout intention. According to Wang (2016), the learning anxiety index was originally designed in such a way that a score of more than 7 indicates that students are at risk of learning anxiety, which allows us to construct a binary variable equal to 1 for students with a score of more than 7. We used the same method to compare the dropout intention percentage between pre-intervention and post-intervention. The first research question, "Is there a significant difference between pre-intervention and post-intervention scores of Strong Kids Knowledge among TASSEL intervention group, SEL intervention group and control group?", was evaluated using a t test comparing Strong Kids Knowledge scores before and after intervention. A significant difference was expected between pre-intervention and post-intervention Strong Kids Knowledge score in each intervention group, with students reporting higher score of Strong Kids Knowledge at post-intervention in each intervention group. The next question, "Does a significant difference exist between pre-intervention and post-intervention self-ratings percentage of students' learning anxiety among TASSEL intervention group, SEL intervention group and control group?", was explored using a dichotomous variable that equals 1 for students with scores over 9, as the average score of our participants is 9, comparing pre-intervention and post-intervention of student learning anxiety. It was hypothesized that the frequency between pre-intervention and post-intervention ratings of student learning anxiety would be significant, with students reporting lower frequency of learning anxiety at post-intervention in each intervention group. The third research question, "Do students report a significant difference between pre-intervention and post intervention of percentage of students' dropout intention among TASSEL intervention group, SEL intervention group and control group?", was evaluated using a dichotomous variable comparing pre-intervention versus post-intervention dropout intention. It was hypothesized that the frequency between pre-intervention and post-intervention ratings of student learning anxiety would be significant, with students reporting lower frequency of dropout intention at post-intervention in each intervention group.

VI. RESULTS

A repeated measure ANOVA was calculated to examine the effect of three different groups intervention (TASEL group, SEL group, control group) on Strong Kids knowledge, learning anxiety and dropout intention based on pre-intervention and post-intervention. A significant main effect of time was found ($F(6,145) = 2.71$, $p < .05$). The score of Strong Kids knowledge in all group of post-intervention is higher than the pre-intervention. There is no significant main effect of group ($F(6,145) = 1.49$, $p > .05$). Finally, there was no interaction between time and group, $F(6,145) = 0.93$, $p > .05$. Regarding question one. A paired-sample t test was calculated to compare the mean of pre-intervention score to the mean of post-intervention score in each group. In TASSEL intervention group, the mean of Strong Kids knowledge on the pre-intervention was 11.80 (SD=2.88), the mean on the post-intervention was 13.27(SD=3.91), no statistically significant increase from pre-intervention to post-intervention was found ($t(50) = -1.88$, $p > .05$. In SEL intervention group, the mean of Strong Kids knowledge on the pre-intervention was 11.65 (SD=3.58), the mean on the post-intervention was 13.45(SD=3.19), a significant increase from pre-intervention to post-intervention was found ($t(50) = -2.64$, $p < .05$. In control group, the mean of Strong Kids knowledge

on the pre-intervention was 12.68 (SD=3.09), the mean on the post-intervention was 12.84(SD=3.28), no significant increase from pre-intervention to post-intervention was found (t (50) =-0.24, p>.05, see table3 and figure 1.

Question 1. Is there any significance difference between pre-intervention and post-intervention scores of Strong Kids Knowledge among TASSEL intervention group, SEL intervention group and control group?

Table 3: *paired sample t test*

	Pre-Intervention		**Post-Intervention**		**Paired sample t-test**		
	M	*SD*	*M*	*SD*	*t*	*df*	*p*
TASSEL Group	11.88	2.88	13.27	3.91	-1.88	50	0.06
SEL Group	11.65	3.58	13.45	3.19	-2.64	50	0.01*
Control Group	12.68	3.09	12.84	3.28	-0.24	50	0.80

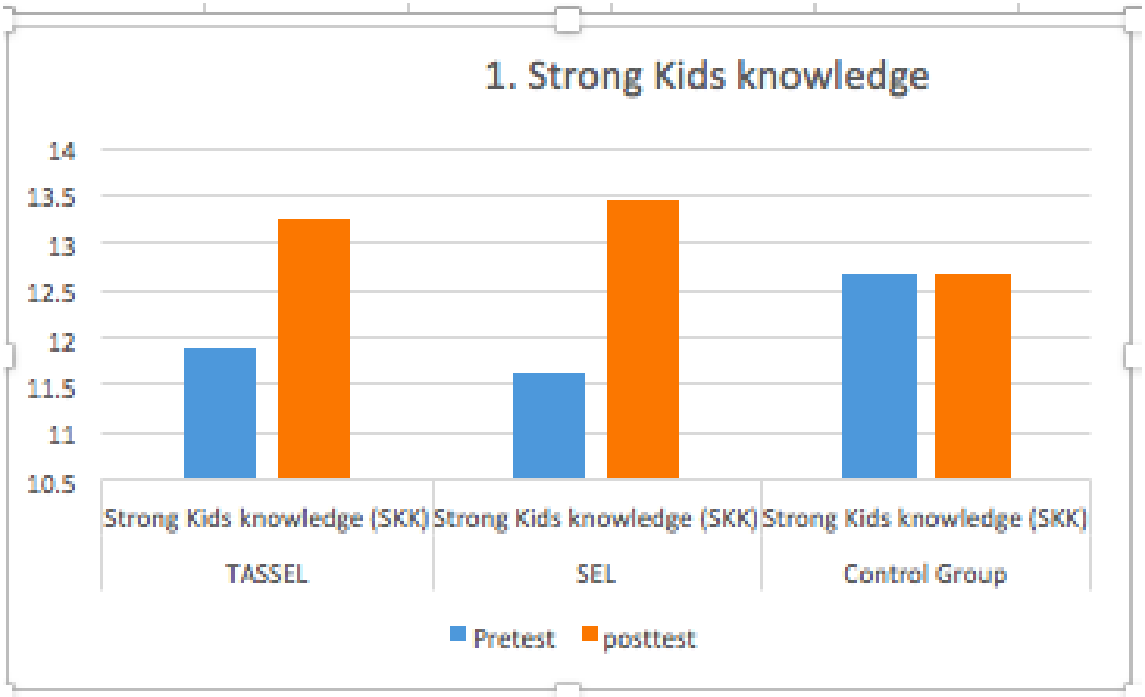

Figure. 1. *Strong Kids Knowledge score between pre-intervention and post-intervention in three groups*

From Figure 1 we can see that SEL can improve junior high school students' Strong Kids knowledge significantly, which is consistent with previous research(Tran,2007). TASSEL can also improve junior high school students' Strong Kids knowledge, although not statistically significant, p=0.06, close to statistically significant. However, the control group did not make any change in junior high school students' Strong Kids knowledge. Regarding question two "Does a significant difference exist between pre-intervention and post-intervention self-ratings of percentage of students' learning anxiety among TASSEL intervention group, SEL intervention group and control group?", a dichotomous variable was calculated to compare the percentage of students who are at risk for learning anxiety between pre-intervention and post-intervention among these three groups. According to Wang et al. (2016), the initial design of the index is that scores above 7 indicate that

students are at risk of learning anxiety. According to the current research on average scores of 9, we can construct a binary variable equal to 1 for students with scores above 9 before and after intervention. According to this criteria, in TASSEL intervention group, the percentage of students at risk for learning anxiety at pre-intervention is 60.8%, and reduced to 51.0% at post-intervention. In SEL intervention group, the percentage of students at risk for learning anxiety at pre-intervention is 49.0%, and reduced to 37.3% at post-intervention. In control group, the percentage of students at risk for learning anxiety at pre-intervention is 54.9%, and reduced to 51.0% at post-intervention, see table 4 and figure 2.

Question 2. Is there any significance difference between pre-intervention and post-intervention self-ratings of students' learning anxiety among TASSEL intervention group, SEL intervention group and control group?

Table 4: *Percentage of participants' learning anxiety at pre-intervention and post-intervention in three groups*

Groups	**Test**	**Pre test**	**Post test**
TASSEL	Learning Anxiety(LA)	60.8%	51.0%
SEL	Learning Anxiety(LA)	49.0%	37.3%
Control Group	Learning Anxiety(LA)	54.9%	51.0%

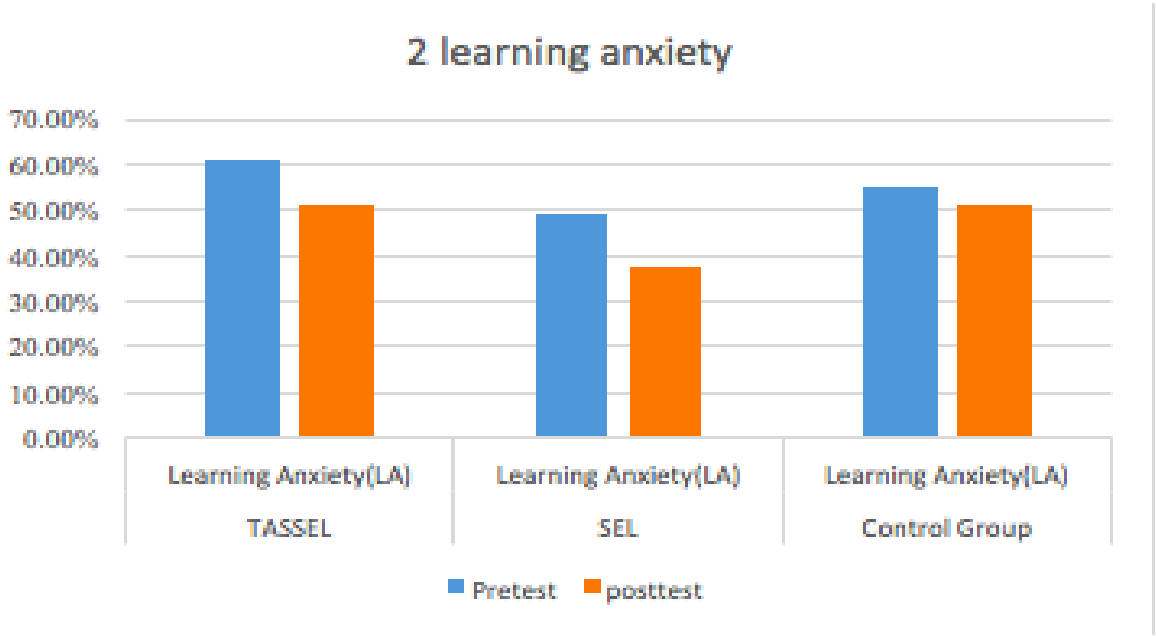

Figure. 2. *Percentage of participants' learning anxiety between pre-intervention and post-intervention in three groups*

From Figure 2, we can see that, TASSEL intervention reduced learning anxiety by 9.8%, and SEL intervention reduced learning anxiety by 11.7%. This result showed that both TASSEL and SEL intervention are better intervention than previous research on reducing learning anxiety. Wang et al. (2016) reduced student learning anxiety by only 2.3%, as they used the self-compiled and first time use curriculum which is not evidence-based. However, Strong Kids is a more than ten years used evidence-based effective intervention in reducing students' negative internalizing problem symptoms (Caldarella et al., 2009; Merrell, 2010; Merrell et al., 2008). Regarding "Do students report a significant difference between pre-intervention and post intervention of percentage of students' dropout intention among TASSEL intervention group, SEL intervention group and control group?", a dichotomous variable was calculated to compare the percentage of students who have dropout intention between pre-intervention and post-intervention among TASSEL intervention group, SEL intervention group and

control group. According to Patricia and Reeve (2010), the index was originally designed such that a score more than3 means the student has dropout intention, and based the current study of mean 3, we can construct a binary variable equal to 1 for students with scores above 3 before and after intervention. According to this criteria, in TASSEL intervention group, the percentage of students who have dropout intention at pre-intervention is 64.7%, and reduced to 58.8% at post-intervention. In SEL intervention group, the percentage of students who have dropout intention at pre-intervention is 64.7%, and increased to 76.5% at post-intervention. In control group, the percentage of students who have dropout intention at pre-intervention is 56.9%, and increased to 58.8% at post-intervention, see table 5 and fig. 3.

Question 3. Is there any significance difference between pre-intervention and post intervention of students' dropout intention among TASSEL intervention group, SEL intervention group and control group?

Table. 5: Percentage of participants' dropout intention at pre-intervention and post-intervention in three groups

Groups	Test	Pretest	posttest
TASSEL	Dropout Intention(DOI)	64.7%	58.8%
SEL	Dropout Intention(DOI)	64.7%	76.5%
Control Group	Dropout Intention(DOI)	56.90%	58.8%

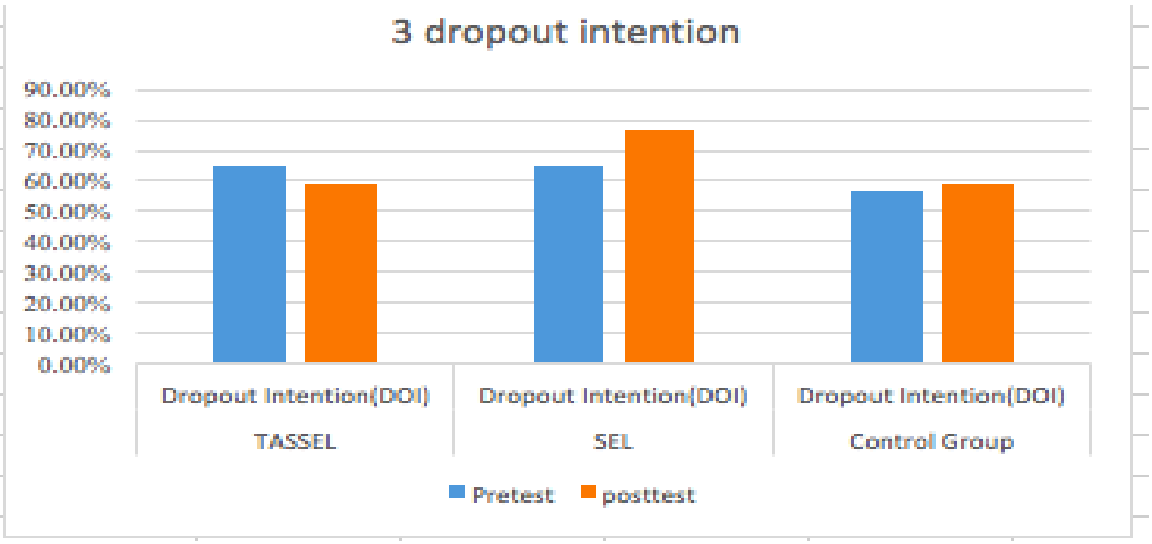

Figure. 3. *Percentage of participants' dropout intention between pre-intervention and post-intervention in three groups*

From Figure 3, we can see that, the TASSEL intervention reduced students' dropout intention by 5.9%, but in SEL intervention group, the students' dropout intention increased 11.8%, even in control group, the students' dropout intention increased 1.9%. According to the discussion with the teachers at the intervention school, the potential reason for the increase of dropout intention at the end of semester is caused by long time boring learning induce more and more students have intention to dropout, and the stress of final exam make them want to quit from school. To increase the dropout intention percentage in SEL intervention group indicates that, SEL intervention alone cannot condense students' dropout intention, especially with short intervention in two weeks, maybe long time intervention can have better effect. although SEL intervention is effective at reducing learning anxiety, it cannot help reducing dropout intention, so learning anxiety is not mediator between SEL intervention and dropout intention, which has not been clear in previous research (Wang et al., 2016).

However, when SEL was combined with TAS, the TASSEL intervention is quite effective at reducing dropout intention, which have better effect than Wang et al. (2016) that reduced dropout intention only by 1.6%.

VII. DISCUSSION

This study compared the effects of a teacher autonomy supportive Strong Kids curriculum intervention, Strong Kids intervention and control group in a Chinese context on poor rural junior high school students' Strong Kids knowledge, learning anxiety and dropout intention.

The results revealed that participants' SEL knowledge in both TASSEL and SEL intervention groups improved, the percentage of students' learning anxiety in both TASSEL and SEL intervention groups reduced after the intervention. The percentage of students' dropout intention reduced in TASSEL intervention group. However, the percentage of students' dropout intention increased in SEL intervention group. These results show that the program was effective in improving SEL knowledge and reducing children's learning anxiety, which is consistent with past research findings showing that the Strong Kids program can improve Strong Kids knowledge and lead to meaningful reductions in problem behaviours, especially in internalizing problem symptoms like learning anxiety (Caldarella et al., 2009; Merrell, 2010; Merrell et al., 2008). However, there is different result about percentage of students' dropout intention among these three groups in the present intervention. In the current intervention, only TASSEL intervention can reduce percentage of students' dropout intention, SEL intervention alone cannot reduce dropout intention. The reasons why SEL intervention cannot reduce learning anxiety may due to the short time intervention, as the current intervention only lasted for 2 weeks, but the previous intervention usually last for 3 months. However, even within two weeks, when the SEL intervention was delivered by a teacher autonomy supportive way, it reduced the percentage of dropout intention by 5.9%, which is more than three times of the effect of Wang et al. (2016), which only reduced dropout intention by 1.6%. Our results are promising for rural boarding schools in Southwest China and other areas with similar education systems. The program can be implemented in an educational environment with minimal professional training and resources (Merrell et al., 2010), and positive results can be observed in short term, as shown in this study.

VIII. LIMATION AND FUTURE RESEARCH

The current study has several limitations. First of all, students' social emotional knowledge and problem behaviors were only based on student self-reports. It would be more objective to include other measures, such as classroom observation, teacher reports, and parents reports in the future. Secondly, in this study, the participants were chosen from poor rural junior high boarding schools in Southwest of China, this study is unlikely to extrapolate the findings to junior high schools in non-poor or urban areas. Third, future research can provide a more complete picture, including follow-up assessments, to determine the extent of the beneficial impact over time. Fourth, classroom intervention, without school and neighbourhood context, lacks a broader ecological perspective to understand the program effect. Fifth, this study only used dropout intention, instead of real dropout rate as dependent variable. Ideally, it's better to include both drop out intention and real dropout rate by a longitudinal study. In addition, we only evaluated the project based on the social knowledge and problem behaviors of the participants before and after the project. If future research can also measure participants' academic performance, it will be beneficial. As Chinese culture attaches great importance to learning achievement, if the research can prove that SEL can improve social emotional ability and learning achievement in Chinese context, the public will pay more attention to the benefits of SEL.

IX. CONCLUSION

This study compared the effect of a two weeks shortened TASSEL program with SEL program for rural junior high boarding school students' mental health in Southwest of China. The results appeared promising: The 12-session teacher autonomy supportive SEL(TASSEL) program improved Strong Kids knowledge, and reduced learning anxiety and dropout intention of the participants, while the SEL intervention could improve Strong Kids knowledge, and reduced learning anxiety, but could not reduce dropout intention. These results revealed that reducing learning anxiety cannot help reducing dropout intention, but teacher autonomy supportive teaching method give a friendly environment to satisfy students' autonomy, self-confidence and competency need, which help students have more authority in study, and as a result, reduce the dropout intention, as teacher autonomy support has been proven to be effective in reducing dropout (Hardre & Reeve ,2003).There are many advantages to add TASSEL program in the whole class teaching. For example, in terms of time, it will be cost-effective and efficient. most importantly, it will provide all students with an equal opportunity to learn non-academic skills like social skills. Social skills play a critical role in academic and behavioural success (Sansosti, Power Smith, and Cowan, 2010). The teacher autonomy supportive Strong Kids program (TASSE) can be implemented in the context of China, which seems to be effective in reducing the problem behaviors of rural middle school students.

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