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The Effect of Sequencing Adventure Activities in Residential Outdoor Education Camp on Student Group Cohesion in Malaysian Institute of Teacher Education

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Abstract: ***This paper attempts to deal with the issue of group cohesion among Malaysian Institute of Teacher Education outdoor education students by applying the elements of sequencing adventure activities in their outdoor education programs. Through this design, the participants were asked to choose their preferred sequence of adventure activities and followed by the pre and post-test of Group Environmental Questionnaire (GEQ) instrument to measure their level of group cohesion. This study focused on 350 (N=350) first year undergraduate students from four campuses who attended four different outdoor education programs. The study utilized a treatment and non-equivalent control group for the pre and post-test design. Result suggested that the sequence of activity from low to high risk activity is the most appropriate approach to enhance students' group cohesion. MANCOVA procedures suggested that the sequence of adventure activities had positively improved the group cohesion aspects of the experimental group with significant gain in ATG-T, ATG-S, GI-T and GI-S. Furthermore, results also highlight the improvement of group outcome aspects (GI-T and GI-S) which surpassed individual aspects (ATG-T and ATG-S). Overall, the results of this study showed that outdoor education improves teacher trainees' group cohesion.***

Keywords: ***Group cohesion, outdoor education, Group Environmental Questionnaire (GEQ), ATG-T, ATG-S, GI-T and GI-S.***

1. Introduction

Outdoor education has recently been the subject of attention from Ministry of Higher Education of Malaysia due to implementation of the Malaysian Higher Education's Bluprint 2015-2025 which highlight the 10 Shift in support of the five system aspirations that focuses on access, equity, quality, efficiency and unity in Malaysian educational system [1]. The focus of the shift is aimed at preparing the country's tertiary education system to meet the challenges of the future. Malaysian students are expected to not only be highly knowledgeable in whatever courses they take but also uphold good moral values in their daily lives. Therefore, outdoor education course in Malaysian Institute of Teacher Education is expected to support the Shift 1 that aims to develop graduates' personal and social developments that are holistic, entrepreneurial, and balanced has been chosen as the course that supports the notion.

In Malaysia, outdoor education has been developed as a consequence of Razak Report 1956 which stressed on national unity through the education system. The Razak Report 1956, the first education report, was important to educational development in Malaysia. The National Education Policy (NEP), as stated in the Education Act 1961, was based on the Razak Report. The objective of the NEP which to achieve national unity and development through education [2] has become a tool of social system [3]. As a result, the Ministry of Education has drafted the Malaysian education system that focuses on the development of physical, emotional, spiritual and social well-balanced individual as stipulated in the NEP [4].

Therefore, to achieve the objectives, the production of quality and excellent teachers is the goal and the mission of the Teacher Education Division (TED), Malaysia Ministry of Education. Teacher quality is a fundamental to the success of the national education policy through quality education to produce an individual who are balanced and harmonious intellectually, spiritually, emotionally and physically [5]. In regard to the goal, the TED has set the philosophy of teacher education which outlines:

> "Teacher, who is noble in character, progressive and scientific in outlook, committed to uphold the aspirations of the nation, and cherishes the national cultural heritage, ensures the development of the individual and the preservation of a united, democratic, progressive and disciplined society" [4].

Hence, the TED has prepared the curriculum and syllabus based on the philosophy outlined which includes the three components that have an equal weightage of academic, co-curricular and practicum to be applied in Teacher training curriculum [5]. Outdoor education in Malaysian Institute of Teacher Education is a form of learning process conducted in either outdoor and indoor settings which involves challenging or adventure activities as a medium to foster individual personal and social growth [6]. It has been proven useful in promoting academic achievement, work commitment, critical thinking, and in preventing delinquency [7]. According to Foley [8], outdoor education is interchangeable with other terms and often referred to as adventure education, adventure programming, outdoor learning, outdoor school, adventure therapy, adventure recreation, adventure tourism, expeditionary learning, challenge education, experiential education, environmental education, and wilderness education. Typically, the stated objectives of outdoor education are improving group cohesion, leadership skills, improving problem-solving skills, self-conceptualization, increasing trust, and improving communication [9], [10]. In other words, the emphasis on interpersonal and intrapersonal relationships is frequently considered to be the primary focus of outdoor education [11].

One of the most popular programs in outdoor education is residential outdoor education (ROE) camping [12]. ROE at higher institution encompasses currently wide range of opportunities for student development [13]. The main goal of these generally focuses on students' group cohesion, leadership, self-esteem, character development and their personal and social development [14]. Therefore, these program are typically expected to translate into lower student attrition rates, increase level of cohesion, increase academic performances, greater levels of emotional and social developments, and more positive attitudes toward institution that they are newly entering [15].

The scope of outdoor education consists of a program of activities planned and prepared with care by personnel and teachers who use the environment, nature and direct experience in the

teaching and learning process. It involves the process of learning by doing. All disciplines, knowledge and experience will be obtained directly with the concept of 'hands on' or 'first-hand experience'. All curriculum content can be enriched and developed through experience gained through these activities. Because the learning process centred on the direct experience, learning gained by participants is faster and more effective. Accordingly, the influence of knowledge and experience can be preserved longer. Dewey [16] stated that experience is very important in order to develop the knowledge and to enrich the process of socialization. Understanding and appreciation of a concept is more effective when learned through direct experience and behaviour. In contrast, there are some researchers who argued and found contradictory results that ROE camp can significantly influenced on the group cohesion eg. [17], [18].

Therefore, amidst all of the inconclusive findings, this research seeks to answer the issue of whether the sequence of activities in ROE in Malaysian Institute of Teacher Education has major enduring effects on group cohesion [19].

2. Methodology

This descriptive study using a quasi-experimental design to answer the research question of the effects of sequencing outdoor education has on group cohesion. Data for this study was collected from four different campuses of the selected Teacher Education Institute of Malaysia through Group Environmental Questionnaire (GEQ) instrument. The study sample consisted of 350 trainee teachers which were divided into treatment group (n=178) and control group (n=172). The samples were asked to rank the sequence of activities based on their perception and point of view that they perceived as influencing their group cohesion while undergo their five days ROE camp. They were asked to select and arrange twenty one activities according to the sequence that they perceived from the less to the most influencing their group cohesion before the ROE. Then pre-test was administered and followed by the post-test after ROE camp to examine the effectiveness of the sequence of activities.

3. Result

The analysis of the data in this study was collected from the experimental group (n=178) before attended ROE camp in four different campuses without control group. There were 3738 responses gathered from 178 students (twenty one activities each) which all the responses were analyzed based on their frequencies and percentage of their selections. In order to get the result, the activities were ranked according to the sequence of students' choices from the lowest to the highest based on the percentage as showed in the Table 1.

According to the data, it revealed that the students perceived a low to high risk activity as a sequence in influencing their group cohesion during the camp. Higher risk activities were found to be more influential in promoting group cohesion. Students ranked the outdoor education activities based on the principle of less influential sequences to the most influential sequence toward group cohesion.

Table 1: Rank Order of Adventure Activities That Positively Influence Students' Group Cohesion

Sequence	Activities	Level of Risk	Percentage

21	Abseiling & Repelling	High	6.9597
20	Sea Kayaking	High	6.532
19	Orienteering	High	6.044
18	Survival	High	5.7387
17	Trekking	High	5.5556
16	Night Walk	High	5.2503
15	Wilderness Camping	Moderate	5.2503
14	Snorkeling	Moderate	5.2503
13	Camp Craft	Moderate	5.0672
12	Creative Games	Low	4.823
11	Training in Group	Low	4.5788
10	Cultural Night	Low	4.5177
9	Community Service	Low	4.3956
8	Discussion in Group	Low	4.0904
7	Cooking in Group	Low	4.0293
6	Religious Activities	Low	3.9683
5	Morning Exercise	Low	3.7851
4	Watching Wildlife	Low	3.663
3	Flora and Fauna	Low	3.663
2	Fishing	Low	3.4799
1	Group Meeting	Low	3.3578
	TOTAL		100

The result showed that low risk activity (sequence 1 to 12) is preferred to be less influential but need to be done before perform higher risk activities. Meanwhile, sequence 13 to 21 is considered to be more influential toward group cohesion. The sequence of more influential activities ranked by the students are as followed: (13) camp craft (5.0672%), (14) snorkeling (5.2503%), (15) wilderness camping (5.2503%), (16) night walk (5.2503%), (17) trekking (5.5556%), (18) survival (5.7387%), (19) orienteering (6.044%), (20) sea kayaking (6.532%), and (21) abseiling and Repelling (6.9597%). Abseiling and rappelling activity was recorded to be the most influential activity that they perceived to encourage group cohesion.

However, to examine the sequencing adventure activity in ROE on group cohesion in more details, MANOVA analyses were conducted to study the differences of subscale (ATG-T, ATG-S, GI-T and GI-S) score between the groups before the camp and MANCOVA analyses were used in order to examine the true effects of ROE camp (after camp) while controlling the effect of pre-test. Thus, next section will provide a detail of finding with multivariate analysis.

Level of GEQ Subscale before ROE Camp

Multivariate Analysis of Variance (MANOVA) was used to study the difference of subscale score between experimental and control group before the ROE camp.

Table 2: Result of the MANOVA Examining the Level of Group Cohesion before the Camp

Effect	Multivariate Analysis	F	P	Partial Eta Square
Intercept	Wilks' Lambda	4461.181[b]	.001**	.981
Group	Wilks' Lambda	6.880[b]	.001**	.074

Design: Intercept + Group *p<0.05 **p<0.01
b. Exact statistic

Table 3: Results of Univariate ANOVA Examining the Level of Group Cohesion before the Camp

Dependent Variable	Experimental (n=178)		Control (n=172)		Univariate ANOVA			
Pre	□	Sd	□	Sd	F	p	artial quared	Eta
ATG-T	26.48	5.607	26.8	5.75	4.681	0.031*	0.013	
ATG-S	33.42	5.216	34.1	5.209	23.229	0.001**	0.063	
GI-T	32.55	5.463	33.34	6.608	1.478	0.225	0.004	
GI-S	25.07	4.514	25.12	6.251	0.006	0.941	0.001	

*p<0.05 **p<0.01

According to the Table 2, MANOVA analysis revealed that the subscales of the GEQ significantly affect group. Using an alpha level of .05, it revealed that this test is significant (Wilks' Λ= .926, F (1, 348) = 6.880, p= 0.001, η2= 0.074). The multivariate η2= 0.074 indicated that 7.4% of multivariate variance of the dependant variable is associated with the group factor. Therefore, multivariate effect sizes were medium [20], [21]. Significant effects in the MANOVA analysis (Table 2) were further investigated with Univariate ANOVA (Table 3). Based on the Table 2, ANOVA results revealed that both experimental and control group showed no significant differences for the subscale of ATG-T (F (1, 348) = 4.681, p= .031, η2= .013) and ATG-S (F (1, 348) = 23.229, p= .001, η2= .063). Meanwhile, significant differences were found between experimental and control group for the GI-T (F (1, 348) = 1.478, p= .225, η2=. 0.004) and GI-S subscale (F (1, 348) = 0.006, p= .941, η2=. 0.001). The results also revealed that multivariate effect sizes were found low and very small effect sizes for most subscales. Overall, there was no difference for the pre-test mean scores between groups in the ATG-T and ATG-S. However, the analyses revealed significant differences on the GI-T and GI-S subscales before the camp.

Level of GEQ Subscales after the Camp

In order to study the impact of sequencing activity in ROE camp on group cohesion, a one way Multiple Analysis of Covariance (MANCOVA) test was conducted. The independent variable in this study was the group of students which comprised of: (1) experimental (n=178) and (2) control (n=172) group. Meanwhile, the dependant variable consisted of post-test score of the GEQ. In the meantime, to control the biases, pre-test scores of GEQ were selected as covariate. The pre-test is sometimes also called a "covariate" because of the way it's used in the data analysis, which we "covary" it with the outcome variable or post-test in order to remove variability or noise [22], [23]. Table 4 and 5 detailed the finding.

Table 4: Results of the MANCOVA Test Examining the Level of Group Cohesion after the Camp

Effect	Multivariate Analysis	F	P	Partial Eta Square
Intercept	Wilks' Lambda	34.410 [b]	.001**	0.288
Group	Wilks' Lambda	9.474 [b]	.001**	0.1
Pre ATG-T	Wilks' Lambda	2.428 [b]	.048*	0.028
Pre ATG-S	Wilks' Lambda	6.736 [b]	.001**	0.079
Pre GI-T	Wilks' Lambda	4.221 [b]	.002*	0.047
Pre GI-S	Wilks' Lambda	7.752 [b]	.001**	0.083

a. Design: Intercept + pre ATGS + pre ATGT + pre GIT + pre GIS + Group
b. Exact statistic
*p<0.05 **p<0.01

Table 5: Results of Univariate ANOVA Examining the Level of Group Cohesion after the Camp

Dependent Variable		Experimental		Control		Univariate ANOVA		
		(n=178)		(n=172)				
		□	Sd	□	Sd	F	p	Partial Eta Squared
Post								
	ATG-T	28.46	5.85	26.74	5.667	10.828	.001**	0.031
	ATG-S	34.76	6.635	34.05	6.2	4.149	.042*	0.012
	GI-T	35.72	6.167	33.62	6.563	14.899	.001**	0.042
	GI-S	28.53	4.493	25.17	6.339	34.274	.001**	0.091
Covariate		**DV**						
	Pre ATG-T	Post ATG-T				9.17	.008*	0.065
		Post ATG-S				0.184	0.668	0.001
		Post GI-T				0.411	0.522	0.001
		Post GI-S				0.193	0.661	0.001
	Pre ATG-S	Post ATG-T				2.056	0.153	0.006
		Post ATG-S				8.771	.033*	0.025

		Post GI-T				1.4	0.238	0.004
		Post GI-S				0.048	0.826	0
	Pre GI-T	Post ATG-T				0.791	0.374	0.002
		Post ATG-S				3.546	0.061	0.01
		Post GI-S				0.705	0.36	0.004
		Post GI-T				25.728	.001**	0.07
	Pre GI-S	Post ATG-T				0.68	0.41	0.002
		Post ATG-S				0.027	0.869	0
		Post GI-S				14.799	.001**	0.041
		Post GI-T				2.879	0.098	0.008
*p<0.05 **p<0.01								

A one-way MANCOVA (Table 4) was conducted to examine the effect of group on all four subscales (ATG-T, ATG-S, GI-T and GI-S) while controlling the pre-test scores. The data revealed that, the groups (experimental and control) showed significant effect on the post-test subscales score (Wilks' Λ=.900, F (1, 344) = 9.474, p= 0.001, η2= 0.1). Meanwhile, the covariates of pre ATG-T scores (Wilks' Λ=.972, F (1, 344) = 2.428, p= 0.048, η2= 0.028), pre ATG-S scores (Wilks' Λ=.981, F (1, 344) = 6.736, p= 0.001, η2= 0.079), pre GI-T scores (Wilks' Λ=.917, F (1, 344) = 4.221, p= 0.002, η2= 0.047) and pre GI-S scores (Wilks' Λ=.953, F (1, 344) = 7.752, p= .001, η2= .083). In overall, it was found that, all covariates significantly influenced the post subscales scores.

However, in more specific, Univariate ANOVA (Table 5) discovered that experimental group's post-ATG-T subscale score significantly differ from the control group (F (1, 344) = 10.828, p = .001, η2= .031 and the covariate of pre ATG-T test (F (1, 344) = 9.17, p= 0.008, η2= 0.065). Meanwhile, for post ATG-S subscale, result suggests experimental group showed significantly higher from the control group (F (1, 344) = 4.149, p = .042, η2= 0.012) and the covariate of pre ATG-S test (F (1, 344) = 8.771, p= 0.033, η2= 0.025).

Similar result recorded in post GI-T subscale score as the experimental group scored differ significantly than the control group (F (1, 344) = 14.899, p = .001, η2= 0.042) and the covariate of pre GI-T test (F (1, 344) = 25.728, p= 0.001, η2= 0.07). Lastly, result suggested experimental group scored significantly higher in the post GI-S subscale than control group (F (1, 344) = 34.274, p = .001) and the covariate of pre GI-S test (F (1, 344) = 3.931, p= 0.001, η2= 0.044) with significantly influence the post test results. In overall, the experimental group scored higher than control group in all subscales with mean comparison of post-test scores revealed that experimental group had significantly higher group cohesion than control group after outdoor education camp.

4. Discussion

Based on the finding, both groups showed a favourable degree of group cohesion that explained the personal involvement an individual felt pertaining to the group's goals and objectives associated with the task and social aspect before the camp. The researcher found that, both

groups scored above midpoint of the scale and considered as had positive perception toward group cohesion (mean score for both groups more than 25). In overall, the control group scored slightly higher than the experimental group for all subscales in the pre-test. The higher score represented greater sense of connectedness to the group. A possible explanations for the difference is that, the control group students' was selected from social studies programme which formally exposed and emphasised to the importance of diversity and respect for differences as well as the need for social cohesion and the effective functioning of society [24]. Students who exposed in Social Studies field is believed can promotes a sense of belonging and acceptance in students as they engage in active and responsible citizenship at the local, community, provincial, national and global level. Meanwhile, personal and social value in Physical Education is embedded in the subject and regularly taught or not taught at all [25]. Therefore, due to inconsistence approach, it is logic to accept the fact that the experimental group scored lowered than the control group before camp.

Meanwhile, the experimental group recorded statistically higher group cohesion than the control group in both social and task aspects in the post-test. A large positive change occurred for the experimental group, supporting the claims that group receiving the sequencing adventure activities of ROE camp intervention would increase scores on all the GEQ subscales. Based on the task and social aspects, the experimental group was found large gain of scores by more than three points on the perceptions of the group as a total unit working toward social aspects of team cohesion (GI-S) and as well as the perceptions of the group as a total unit working toward task aspects of team cohesion (GI-T) subscales after the ROE camp.

Whereas the individual attraction to the group to execute task aspects (ATG-T) and the individual attraction to the group to execute social aspects (ATG-S) only increased by almost two points. It is important to note that, individual factors of cohesion are not always noted in the research but cohesion in general is linked to success between work groups, so guiding the research to determine which factors of cohesion have the strongest effect may be useful [26]. Thus the current finding showed that sequencing adventure activities (low to high risk) in ROE camp that was conducted in four different locations in five days that away from their normal daily routine has played an important role for the changes.

The researcher believed that the element of sequence of challenge and risk applied in the activities encourage students to always in a state of readiness and thus strengthen the bond in the group [27]. The implementation of a variety of risk level from low to high risk adventure activities has provided a wide range of chances for the students to challenge themselves in the wilderness. Therefore, the finding suggest that exposure to sequenced ROE camp activities exert a great influence of the improvement of group cohesion among students.

5. Conclusion

The finding of this study proved that exposure to ROE camp has a significant impact on student's group cohesion. In connection with this study, several conclusions can be made. The first is that participation in outdoor education programs provides benefits in terms of changes in student group cohesion. This study also showed that there are positive changes in all subscales studied. This finding is consistent with the findings of studies conducted by other researchers such as Neill [28]. Summary findings coincide with the findings made by Bisson [29] and Priest

[30] which showed that sequencing with low risk activities should be done before a more challenging and risky activity.

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