



## FACTORS INFLUENCING THE EFFECTIVENESS OF CAMPUS RECREATION MANAGEMENT: A STRUCTURAL EQUATION MODEL

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### ABSTRACT

**Purpose.** This study developed and validated the consistency of a structural equation model of factors influencing the effectiveness of campus recreation management.

**Methods.** The study involved 416 teachers and administrators, enrolled with multistage sampling in four university groups: public universities, Rajamangala University of Technology, Rajabhat University, and private universities. The data collection tool was a 5-rating-scale questionnaire. The data were analysed with descriptive statistics. The validity of the structural equation model was tested with the LISREL 8.72 software.

Results. The study proved that the structural equation model was consistent with the empirical data, with a statistical significance level of 0.05 ( $\chi^2 = 124.75$ ,  $df = 83$ ,  $p = 0.048$ ,  $RMSEA = 0.035$ ,  $GFI = 0.93$ ,  $AGFI = 0.96$ ).

**Conclusions.** The factors influencing the effectiveness of campus recreation management ordered from the highest to lowest mean score were: organization characteristics, internal environment, employee characteristics, and managerial policies and practices. The independent variables in the structural equation model could explain 68% of the variation in the effectiveness of campus recreation management.

**Key words:** campus recreation management, effectiveness, structure equation model

### Introduction

Currently, globalization has impacted changes and adjustments in all aspects of life, especially at universities as institutions of higher education which produce the many graduates who contribute to the human resources necessary to serve the nation and society. To meet the requirements and comply with their aims, universities not only undertake education and academic management, but also encourage their students to join various activities in recreational programs and to have the opportunity to enhance their quality of life [1, 2]. The primary goal of campus recreation is to serve students, and many higher education institutions are aware of the advantages that students take of participating in campus recreation, for example enhancing the quality of student life with regard to both mental and physical health and preparing people for their future lives. Therefore, the impact of campus quality is not limited to the academic year, but extends beyond the individuals' university years throughout their lives in terms of their choices of physical activities [3]. This

is consistent with the research [4] concluding that it is necessary to develop both mental and physical health. Furthermore, several studies [3, 5–7] confirmed that the benefit of participation in campus recreation could help to achieve student satisfaction with the holistic academic experience, reduce stress, increase the retention rate and grades, and assist the development of social skills. For example, Forrester [6] revealed that according to 64% of students, their increased participation in campus recreation provided them with skills/abilities that would be used after leaving university. Above all, universities as places of higher education need to be managed and arranged to achieve the purposes of campus recreation through service, development, and relations, to meet different levels of interest of cooperation or competitive play activity in a game form. This can be done by utilizing existing resources in the most effective manner [8].

Cameron [9] revealed that effective organizations are responsive to and expedient in identifying and meeting the needs of their target markets. Concepts like organizational effectiveness, total quality management, and

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quality circles are emerging as common features in many university organizations so that the author defined 'organizational effectiveness' as a process of evaluating an organization's actual performance relative to a predetermined standard or a series of objectives. After all, universities must ensure that their service offerings are expertly conceived, promoted, staged, and evaluated, if these are to survive in a competitive market [10].

However, campus recreation management in Thai universities has not been truly achieved because of mismanagement; previous studies [11, 12] have reported the implementation of unclear recreation activities policy in universities, reflecting inadequate cooperation and insufficient support from the administrators, faculties, and students. In particular, students encountered obstacles to arranging study time and recreation time as another form of study. For example, Young et al. [13] reported that the lack of time and knowledge of recreation programs and activities were both statistically significant constraints to participation. These outcomes were consistent with the research conducted by Gibson et al. [14], who found insufficient management, meaning that the funding, materials, and nature of the activities were not appropriate for the current situation. The shortage of equipment and facilities due to budget restrictions in the schools of the faculties affected the participation of students in recreation activities. Furthermore, previous research [15] reported that nearly half of all university students lacked sufficient physical activity to efficiently manage recreation in the university and to successfully achieve the set objective of the university. This suggests a failure in the ability of the university executives to administer and manage campus activities in order to meet the needs of individuals and groups involved both inside and outside the university.

Additionally, no previous study was found in Thailand on structural equation modelling with factors influencing the effectiveness of campus recreation management. For this reason, the author was interested in studying the factors that influenced the recreation management effectiveness using a structural equation model (SEM) and focused on four factors influencing the effectiveness of management with regard to campus recreation, as well as eight dimensions of campus recreation management effectiveness; this approach can be used to create and confirm a model that shows the relationships between variables and empirical data. Moreover, the results could show direct, indirect, and total effects in all factors, the results of which could be used by the campus recreation administrators for prescriptive identification of areas that need improvement.

## Material and methods

### Participants

The total of 416 participants – 271 teachers working in a university for at least two years and involved in

campus recreation, and 145 administrators who still held various positions in campus recreation – were recruited by multistage sampling from four university groups: public universities, Rajamangala University of Technology, Rajabhat University, and private universities. The characteristics of the participants were: age, 31–40 years (123, 45.40%) for teachers and 51–60 years (57, 39.30%) for administrators; and master's degree (182, 67.20% for teachers and 89, 61.38% for administrators).

### Procedure

The instrument included individual measures of all five constructs discussed in the study; they were utilized in the questionnaire with a single question requiring the participants to rate their perception on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The preliminary questionnaire was submitted to 7 experts to consider the index of item objective congruence (IOC) between each question and the objective. The IOC result was 0.97. With the modified version of the questionnaire, a pilot study was conducted among a small sample ( $n = 30$ ) with a population similar to the final sample. The questionnaire was then analysed for reliability quality, and the Cronbach's alpha ( $\alpha$ ) was acceptable at the level of 0.97. A survey packet was prepared which included the revised questionnaire, a cover letter explaining the purpose of the study and requesting cooperation from the participant, and an informed consent form. Approval from the Ethical Committee for Human Research at Chulalongkorn University, Thailand was obtained prior to data collection. Eight trained research assistants provided on-site support with the data collection process. The completion of the questionnaire took 20 minutes on average.

In the study, there were 4 factors that influenced the organizational effectiveness: (1) organization characteristics, consisting of 24 items (e.g. the organization is flexible and adaptable to accommodate changes); (2) internal environment, consisting of 20 items (e.g. it encourages personnel to work as a team); (3) employee characteristics, consisting of 17 items (e.g. the personnel are united and feel as part of the organization); (4) managerial policies and practices, based on the concept of Steers [16] (e.g. the leader gives staff the opportunity to participate in decision making). In turn, the 8 dimensions of campus recreation management effectiveness were as follows: (1) program quality, consisting of 10 items (e.g. the university offers a wide range of programs); (2) interaction quality, consisting of 5 items (e.g. the campus recreation departments employees are competent); (3) outcome quality, consisting of 5 items (e.g. the recreation programs provide students with many opportunities for social interaction); (4) physical environment quality, consisting of 5 items (e.g. the facility is clean and well maintained); (5) faculty and administration employment satisfaction, consisting of 6 items (e.g. you are satisfied with the jobs and employment at

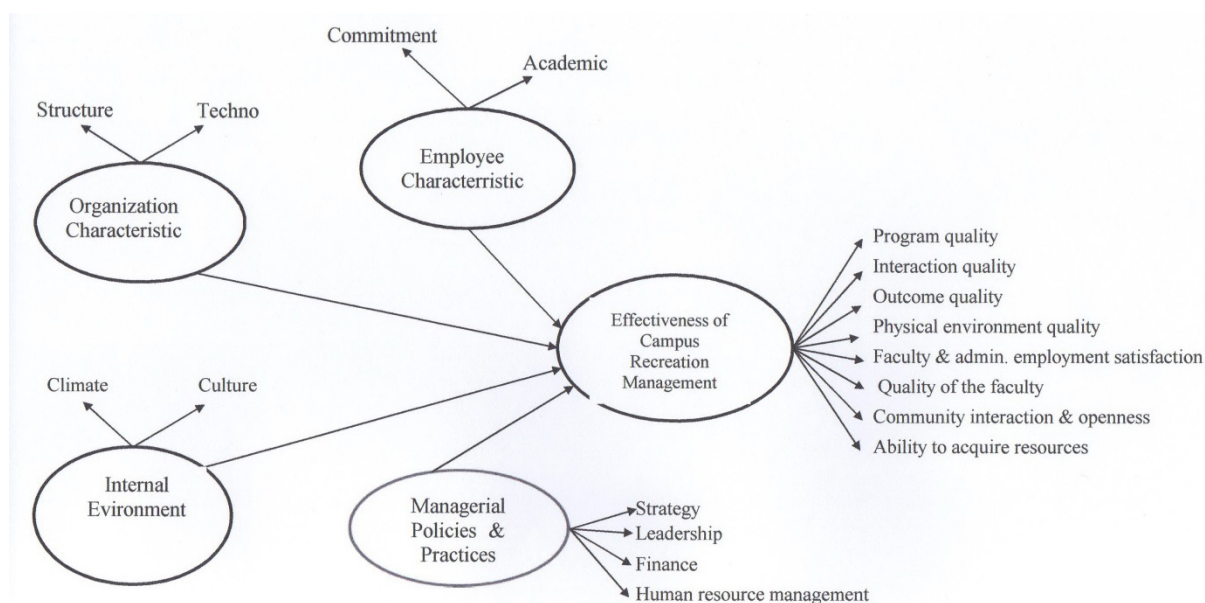


Figure 1. Conceptual model for factors influencing the effectiveness of campus recreation management

the university); (6) quality of the faculty, consisting of 8 items (e.g. the amount of stimulation toward recreation professional development provided by the university is sufficient); (7) community interaction and openness, consisting of 6 items; (8) ability to acquire resources, consisting of 6 items [10, 16–19].

The conceptual model for factors influencing the effectiveness of campus recreation management is shown in Figure 1.

Statistical analysis

The statistical analysis included the frequency, percentage, mean, standard deviation (*SD*), skewness (*SK*), and kurtosis (*KU*) of the observed variables to develop the model and the path analysis in the structural equation modelling based on the LISREL 8.72 software package.

Results

The research was conducted to develop and validate a structural equation model for factors influencing the effectiveness of campus recreation management on the basis of the hypothesis that the theoretical model is consistent with empirical data, as well as to investigate the magnitude of indirect and direct influences, effects, and interactions of causal factors that impact on the effectiveness of campus recreation management. There were 416 participants. Most of them were male (60.82%) and they worked at private universities (33.60%), followed by Rajabhat University (32.80%), public universities (26.20%), and Rajamangala University of Technology (7.40%). The results used to determine the validity of the variables in the model to measure the factors influencing the effectiveness of campus recreation management are shown in Table 1.

Table 1 shows that there are correlations among the observed variables in all sub-models of factors influencing the effectiveness of campus recreation management, with the statistical significance oft 0.01 and with correlation values ranging from 0.590 to 0.800, indicating that the correlations are high. The Kaiser-Mayer-Olkin (KMO) value was 0.842. Bartlett’s test of sphericity, the degrees of freedom, and *p* values for all variables differed from 0, with the statistical significance of 0.01. These data indicate that the correlation matrix for the 4 observed variables was not an identity matrix and there were sufficient variable correlations to be used in the component analysis. The results of all 5 confirmatory factors influencing the effectiveness of campus recreation management are shown in Table 2.

As presented in Table 2, the results of confirmatory factor analysis indicate that all the models were consistent with the empirical data. The variables had positive factor loadings ranging from 0.51 to 0.98, which were acceptable [20]. Considering each factor in detail, it was found that the latent variable of organization characteristics was an observed variable of the use of technology condition (Techno), which can be measured with the organization structure variable (Structure). The latent variable of internal environment was an observed variable of the culture (Culture), which was a better measure than organization climate (Climate). The latent variable of employee characteristics was an observed variable of organization commitment (Commitment), which was a better measure than the observable variable of academics (Academic). The latent variable of managerial policies and practices was an observed variable of strategic management (Strategy), which was the best measure. The latent variable of effectiveness of campus recreation management can be measured with the observed variable of the outcome quality.

Table 1. Analysis of factors influencing the effectiveness of campus recreation management

Factors		Structure	Techno	Mean	SD		
Organization characteristic	Structure	1	0.757*	3.770	0.032		
	Techno		1	3.580	0.037		
KMO = 0.842, Bartlett's test of sphericity chi-squared = 3.26, <i>df</i> = 2, <i>p</i> = 0.07, RMSEA = 0.031							
		Culture	Climate	Mean	SD		
Internal environment	Culture	1	0.800*	3.670	0.033		
	Climate		1	3.750	0.031		
KMO = 0.842, Bartlett's test of sphericity chi-squared = 3.33, <i>df</i> = 2, <i>p</i> = 0.068, RMSEA = 0.077							
		Commitment	Academic	Mean	SD		
Employee characteristic	Commitment	1	0.758	4.090	0.028		
	Academic		1	3.830	0.035		
KMO = 0.842, Bartlett's test of sphericity chi-squared = 2.20, <i>df</i> = 2, <i>p</i> = 0.967, RMSEA = 0.060							
		Strategy	Leadership	Finance	Human	Mean	SD
Managerial policies and practices	Strategy	1	0.650*	0.686*	0.710*	3.890	0.013
	Leadership		1	0.590*	0.631*	4.120	0.010
	Finance			1	0.662*	3.920	0.013
	Human				1	3.790	0.012
KMO = 0.842, Bartlett's test of sphericity chi-squared = 12.77, <i>df</i> = 5, <i>p</i> = 0.052, RMSEA = 0.038							
KMO – Kaiser-Mayer-Olkin index, RMSEA – root mean square error of approximation							
* <i>p</i> < 0.01							

Table 2. The confirmatory factors influencing the effectiveness of campus recreation management

Latent variable	Observed variable	Factor loading	SE	<i>t</i>	R <sup>2</sup>
Organization characteristic	Structure	0.74	0.05	16.04	0.75
	Techno	0.98	0.05	22.66	0.59
chi-squared = 5.10, <i>df</i> = 2, <i>p</i> = 0.07, GFI = 0.99, AGFI = 0.92					
Internal environment	Culture	0.92	0.04	23.01	0.76
	Climate	0.89	0.04	22.09	0.78
chi-squared = 3.36, <i>df</i> = 2, <i>p</i> = 0.067, GFI = 0.99, AGFI = 0.97					
Employee characteristic	Commitment	0.84	0.05	16.8	0.64
	Academic	0.8	0.04	18.14	0.72
chi-squared = 2.20, <i>df</i> = 2, <i>p</i> = 0.99, RMSEA = 0.06					
Managerial policies and practices	Strategy	0.67	0.13	5.15	0.6
	Leadership	0.52	0.03	17.33	0.63
	Finance	0.54	0.13	4.14	0.77
	Human	0.62	0.22	2.81	0.99
chi-squared = 15.74, <i>df</i> = 5, <i>p</i> = 0.052, GFI = 0.87, AGFI = 0.88					
Effectiveness of Campus Recreation Management	Program quality	0.59	0.03	19.99	0.73
	Interaction quality	0.51	0.03	17.78	0.64
	Outcome quality	0.62	0.03	19.63	0.72
	Physical environment	0.59	0.03	17.8	0.62
	Employment satisfaction	0.51	0.03	16.23	0.56
	Quality of the faculty	0.55	0.03	15.81	0.53
	Community interaction	0.51	0.03	16.47	0.58
	Ability to acquire resources	0.53	0.03	15.88	0.51
	chi-squared = 1.14, <i>df</i> = 3, <i>p</i> = 0.77, GFI = 1, AGFI = 0.99				

GFI – goodness of fit index, AGFI – adjusted goodness of fit index, RMSEA – root mean square error of approximation

Table 3. Correlation, mean, and standard deviation of the observed variables in the model of factors influencing the effectiveness of campus recreation management

Factors	Structure	Techno	Culture	Climate	Commitment	Academic	Strategy	Leadership	Finance	Human resource management	Program quality	Interaction quality	Outcome quality	Physical environment quality	Faculty and admin. employment satisfaction	Quality of the faculty	Community interaction and openness	Ability to acquire resources	
Structure	1																		
Techno	0.815*	1																	
Culture	0.704*	0.704*	1																
Climate	0.573*	0.558*	0.807*	1															
Commitment	0.546*	0.480*	0.568*	0.592*	1														
Academic	0.590*	0.533*	0.484*	0.437*	0.786*	1													
Strategy	0.311*	0.330*	0.415*	0.432*	0.367*	0.368*	1												
Leadership	0.299*	0.280*	0.387*	0.362*	0.356*	0.359*	0.729*	1											
Finance	0.296*	0.283*	0.385*	0.339*	0.298*	0.318*	0.699*	0.648*	1										
Human resource management	0.310*	0.311*	0.410*	0.400*	0.340*	0.318*	0.727*	0.699*	0.744*	1									
Program quality	0.631*	0.660*	0.542*	0.501*	0.440*	0.554*	0.321*	0.305*	0.283*	0.321*	1								
Interaction quality	0.542*	0.536*	0.475*	0.438*	0.457*	0.531*	0.322*	0.269*	0.235*	0.282*	0.694*	1							
Outcome quality	0.585*	0.591*	0.518*	0.462*	0.465*	0.585*	0.321*	0.341*	0.250*	0.302*	0.720*	0.700*	1						
Physical environment quality	0.581*	0.577*	0.522*	0.497*	0.434*	0.506*	0.320*	0.293*	0.243*	0.296*	0.738*	0.639*	0.703*	1					
Faculty and admin. employment satisfaction	0.580*	0.591*	0.527*	0.527*	0.376*	0.454*	0.318*	0.307*	0.283*	0.340*	0.607*	0.592*	0.583*	0.590*	1				
Quality of the faculty	0.602*	0.650*	0.551*	0.467*	0.471*	0.586*	0.349*	0.355*	0.321*	0.346*	0.612*	0.576*	0.624*	0.559*	0.688*	1			
Community interaction and openness	0.615*	0.623*	0.571*	0.555*	0.504*	0.569*	0.364*	0.311*	0.328*	0.337*	0.655*	0.590*	0.610*	0.592*	0.630*	0.654*	1		
Ability to acquire resources	0.614*	0.598*	0.536*	0.487*	0.573*	0.656*	0.282*	0.337*	0.276*	0.295*	0.615*	0.536*	0.609*	0.552*	0.589*	0.666*	0.622*	1	
Mean	3.76	3.62	3.66	3.82	4.01	3.78	3.89	4.14	3.90	3.78	3.76	3.82	3.92	3.61	3.48	3.84	3.76	3.61	
SD	0.58	0.69	0.63	0.58	0.69	0.81	0.38	0.32	0.36	0.39	0.68	0.65	0.73	0.69	0.75	0.67	0.74	0.69	

KMO = 0.846, Bartlett's test of sphericity = 4721.30, chi-squared = 124.75, df = 83, p = 0.048

KMO – Kaiser-Mayer-Olkin index

\* p < 0.01

Table 4. Direct and indirect effects and total effect of factors of the effectiveness of campus recreation management

Factors	Effectiveness of campus recreation management	Factors			
		Organization characteristic	Internal environment	Managerial policies & practices	Employee characteristic
Managerial policies & practices	Direct effect (DE)	0.12*	0.17*		
	Indirect effect (IE)	–	–		
	Total effect (TE)	0.12*	0.17*		
Employee characteristic	Direct effect (DE)	–	–	0.35*	
	Indirect effect (IE)	0.15*	0.35*	–	
	Total effect (TE)	0.15*	0.35*	0.35*	
Effectiveness of campus recreation management	Direct effect (DE)	0.31*	0.19*	0.12*	0.14*
	Indirect effect (IE)	0.01	0.02	0.01	–
	Total effect (TE)	0.32*	0.21*	0.13*	0.14*

\*  $p < 0.05$

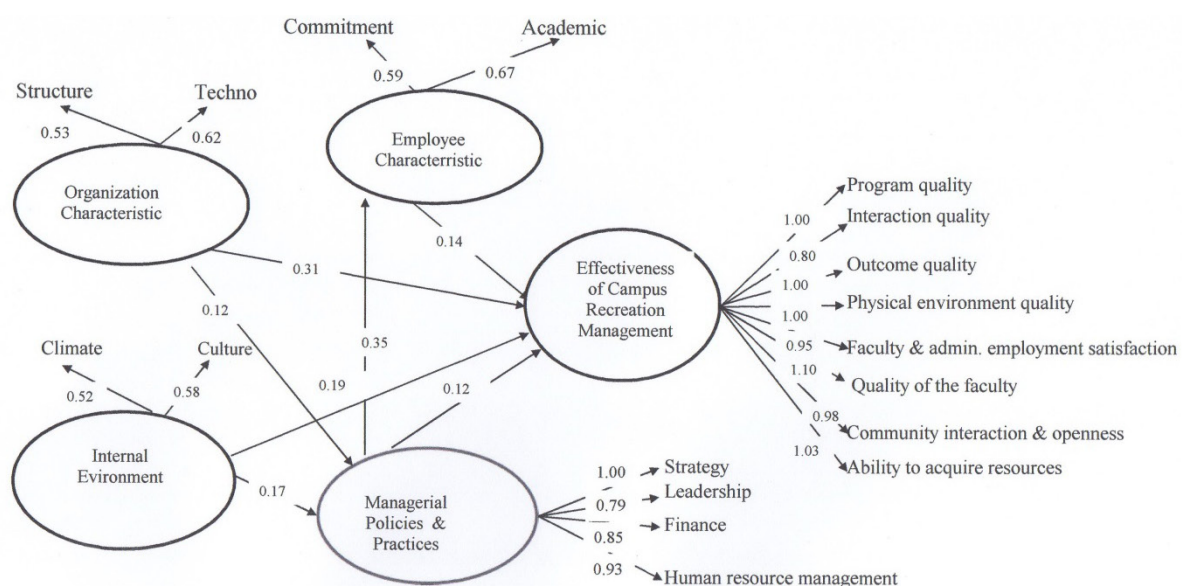


Figure 2. The structural equation model of factors influencing the effectiveness of campus recreation management

The analytical results to determine the consistency of the structural equation model of the effectiveness of campus recreation management for the 18 observable variables presented correlations which were different from 0, with statistical significance levels of 0.01 and 0.05. The minimum and maximum correlation coefficient values were 0.815 and 0.235, respectively, showing a low-to-high relationship between variables. The KMO index was 0.846, Bartlett's test of sphericity was 4,721.30, chi-squared was 124.75, the degrees of freedom were 83, and the  $p$ -value was 0.048, which differed from 0, with the statistical significance of 0.01, showing that the correlation matrix of the observed variables was not the identity matrix and the relationship between variables was high enough to analyse the causal relationship. The analysis of the data presented

in Table 3 shows consistency between the models and the empirical data on the basis of the statistical measure of the goodness-of-fit of the model. It was observed that all the values met the criteria, although the chi-squared  $p$ -value turned out less than 0.05 (0.048), indicating that it did not meet the criteria but was acceptable as the consistency value remained in the range  $0.05 \leq p < 0.10$  [20]. The goodness-of-fit value of at least 0.90 and parsimonious fit indices of at least 0.50 can be used to judge the effectiveness and goodness-of-fit of a model. Even though the chi-squared value of both indices was not statistically significant [21], other indices specifying the goodness-of-fit yielded values that met the criteria [20, 21].

The data set was analysed with LISREL, the SEM software package. The resultant statistics indicated that all

rates were compatible with the empirical data. The results of the SEM analysis showed the relationships between variables, which are summarized in Table 4, presenting the direct and indirect influence and the overall influence of various factors on the effectiveness of campus recreation management. These were, in the descending order: organization characteristics, with values for the direct, indirect, and total effects of 0.31, 0.01, and 0.32, respectively; followed by internal environment, with values for the direct, indirect, and total effects of 0.19, 0.02, and 0.21, respectively; employee characteristics, with the direct effect of 0.14; and managerial policies and practices, with the total effect of 0.13. The structural equation model could explain 68% of the overall variance in the effectiveness, as shown in the equation:

$$\text{effectiveness of campus recreation management} = 0.32 (\text{organization characteristic}) + 0.21 (\text{internal environment}) + 0.14 (\text{employee characteristic}) + 0.13 (\text{managerial policies \& practices})$$

with Errorvar = 0.084,  $R^2 = 0.68$ .

The results of analysing the factors of the SEM influencing the effectiveness of campus recreation management are shown in Figure 2.

## Discussion

The results showed that the structural equation model of factors influencing the effectiveness of campus recreation management was consistent with the empirical data and conceptual framework. The organization characteristics factor had a direct influence on the effectiveness of campus recreation management, with the statistical significance of 0.05, and also had an indirect effect on the effectiveness of campus recreation management, mediated by the managerial policies and practices. It was also found that the observed variable with the highest influence on the effectiveness of campus recreation management was the use of technology (Techno). The results of this research were inconsistent with previous studies [22–25] because of the current situation differing substantially in economic, social, political, and technological factors; therefore, the guidelines for the administration are not suitable for current and future conditions, leading to an inability to respond to rapid changes and the expectations of service [26, 27]. In order to solve these problems, universities need to adapt on the basis of globalization, with the introduction of technology to enhance both the restructuring and strategies developed with the use of information technology. In addition, the responsible organizations, including external ones, should immediately co-operate in terms of technology application.

The internal environment factor, which consisted of 2 observed variables, namely the organization culture

(Culture) and organization climate (Climate), exerted a direct influence on the effectiveness of campus recreation management and also had an indirect effect on this effectiveness, mediated through the managerial policies and practices. In this study, it can be noted that the characteristics of the organization culture were not arranged in any pattern, although the concept of Cameron and Quinn [28] classified organization culture into 4 patterns (family, market, hierarchy, and temporary), but rather there was a combination of various cultural patterns. For example, there is a transmission of the recreation plan appropriately put it into practice across the campus both formally and informally, to achieve the important objectives of campus recreation management. Staff members are encouraged to work as a team by focusing on engagement, co-operation, evaluation of management actions, and creating a suitable atmosphere and opportunities for the personnel to become involved in defining the vision and goals of recreation management, so that the staff members are committed and have a goal to work toward in line with the goals of the organization. Therefore, it can be declared that the university has a mixture of the featured organization cultures. As a result, campus recreation management needs to be flexible to adapt to various situations and to remain sustainably competitive with other enterprises under the pressures of changing conditions and globalization. The employee characteristics consisted of 2 observed variables, organization commitment and academics, which had a direct influence on the effectiveness of campus recreation management, with the significance level of 0.05. Managerial policies and practices were a contributing factor, which was consistent with the suggestion by Steers [16] that higher organization results in greater retention and decreased absenteeism in the organization to achieve the goals. The findings of various researchers have shown that where the level of organizational commitment is high, the absenteeism rate goes down [25].

Managerial policies and practices both directly and indirectly influenced, through employee characteristics, the effectiveness of campus recreation management, with the significance level of 0.05. The observed variable of managerial policies and practices had the highest impact on the effectiveness of campus recreation management. This suggests that campus recreation must be managed proactively to keep up with the current situation in order to increase the number of students participating in recreational programs. Thus, universities should realize the importance of strategic management which considers dynamic environment factors at present and in the future in order to achieve the organization objectives in an efficient manner.

The quality of the faculty was the dimension with the highest level of correlation with the effectiveness of campus recreation management, followed by ability to acquire resources and program quality. However,

when individual aspects were considered, the quality of the faculty in terms of the appropriate number of faculty members conducting recreation research had a moderate mean score. This included an indicator of the appropriate amount of recreation articles published in national or international journals. The phenomenon may have been due to the universities being unable to operate in these areas completely. This observation was consistent with the assessment of higher education institutions in the first round of the Bureau of Standards and External Quality Assessment [29], which found the level of research and creative works of higher education teachers being merely 0.1545 titles per year. Research originally published in national and international issues had a value of only 0.10 and 0.04 per person per year, respectively. The universities need to further develop this aspect.

Although this research was carefully prepared, there were some unavoidable limitations and the researcher identified several shortcomings. First, because of the time limit, some questionnaires were returned too late to be included in the analysis. Although the 416 participants were sufficient for meaningful analysis, it is always better to collect more data, in spite of the cost and time constraints. Second, because of the violent political conflict in three provinces of Southern Thailand (Yala, Pattani, and Narathiwat), it was not safe to sample the universities located there. Third, some students did not wish to participate, even though they were prime stakeholders. Hence, further research among students should also take place.

## Conclusions

With regard to campus recreation management effectiveness, the results of the study revealed that all variables in the model could jointly explain the effectiveness of campus recreation management in all dimensions. The findings can also be used to develop a reference model of causal factors that influence the effectiveness of campus recreation management in order to promote action by education institutions management in the future so that the objectives of a university can be met. The utilization of this information should be a high priority to stimulate management planning and to assist with the further development of effective university recreation management.

## References

1. London M, Crandall R, Seals GW. The contribution of job and leisure satisfaction to quality of life. *J Appl Psychol.* 1977;62(3):328–334; doi: 10.1037/0021-9010.62.3.328.
2. Coleman D, Iso-Ahola SE. Leisure and health: the role of social support and self-determination. *J Leisure Res.* 1993;25(2):111–128.
3. Stier WF, Schneider RC, Kampf S, Haines S, Wilding GE. A survey of campus recreation directors at NIRSA institutions: activities emphasized, student participation patterns, trends and future offerings contemplated. *Rec Sports J.* 2005;29(1):42–58; doi: 10.1123/rsj.29.1.42.
4. Iwasaki Y, Mannell RC. Hierarchical dimensions of leisure stress coping. *Leisure Sci.* 2000;22(3):163–181; doi: 10.1080/01490409950121843.
5. Downs PE. Value of recreational sports on college campuses – introduction. *Rec Sports J.* 2003;27(1):5–8; doi: 10.1123/rsj.27.1.5.
6. Forrester SA. The benefits of campus recreation. Corvallis: NIRSA; 2014.
7. Shonk DJ, Carr JW, De Michele PE. Service quality and satisfaction within campus recreation: the moderating role of identification. *Rec Sports J.* 2010;34(1):9–23; doi: org/10.1123/rsj.34.1.9.
8. NIRSA. Campus recreation: Essentials for the professional. Champaign: Human Kinetics; 2008.
9. Cameron K. A study of organizational effectiveness and its predictors. *Manag Sci.* 1986;32(1):87–112; doi: 10.1287/mnsc.32.1.87.
10. Weese WJ. The development of an instrument to measure effectiveness in campus recreation programs. *J Sport Manag.* 1997;11(3):263–274; doi: 10.1123/jsm.11.3.263.
11. Kaewphadung T. Students' opinions towards the recreational activities at Rajamangala Institute of Technology, University Wangklaikangwon Campus [in Thai]. Master dissertation. Bangkok: Srinakarintharawiroth University; 2004.
12. Pankae P. Needs to participate in student activities of education faculty's students of Chiang Mai University. Chiang Mai: Chiang Mai University; 2005.
13. Young SJ, Ross CM, Barcelona RJ. Perceived constraints by college students to participation in campus recreational sports programs. *Rec Sports J.* 2003;27(2):47–62; doi: 10.1123/rsj.27.2.47.
14. Gibson JL, Ivancevich JM, Donnelly JH Jr, Konopaske R. Organizations: behavior, structure, processes. New York: McGraw-Hill; 2004.
15. Sabourin S, Irwin J. Prevalence of sufficient physical activity among parents attending a university. *J Am Coll Health.* 2008;56(6):680–685; doi: 10.3200/JACH.56.6.680-685.
16. Steers RM. Organizational effectiveness: A behavioral view. Santa Monica: Goodyear Publishing Company; 1977.
17. Cameron K. Measuring organizational-effectiveness in institutions of higher-education. *Admin Sci Quart.* 1978; 23(4):604–632; doi: 10.2307/2392582.
18. Kwan P, Walker A. Positing organizational effectiveness as a second-order construct in Hong Kong higher education institutions. *Res High Educ.* 2003;44(6):705–726; doi: 10.1023/A:1026179626082.
19. Ko YJ, Pastore DL. An instrument to assess customer perceptions of service quality and satisfaction in campus recreation programs. *Rec Sports J.* 2007;31(1):34–42; doi: 10.1123/rsj.31.1.34.
20. Angsachoti S, Vjittwanna S, Pinyophanuwat R. Statistical analysis research in social and behavioural sciences. Techniques using LISREL [in Thai]. Bangkok: Mission Media; 2008.
21. Kline RB. Principles and practice of structural equation modeling, 3<sup>rd</sup> ed. New York: The Guilford Press; 2011.
22. Hemapandha W. Factors affecting effectiveness of golf tourism management in Thailand [in Thai]. Doctoral dissertation. Chon Buri: Burapha University; 2012.



23. Rodkhem R. The development of an evaluation model for the organizational effectiveness of colleges under the Ministry of Public Health by the balanced scorecard approach [in Thai]. Doctoral dissertation. Bangkok: Chulalongkorn University; 2004.
24. Panich A. The organizational effectiveness factors of Rajabhat University [in Thai]. Doctoral dissertation. Bangkok: Silpakorn University; 2007.
25. Samuttai R. Development of a multi-dimensional and integrated causal model of faculty effectiveness in higher education institutions [in Thai]. Doctoral dissertation. Bangkok: Chulalongkorn University; 2006.
26. Karawekphun B. The new public administration. Available from: <http://wiki.kpi.ac.th/index.php?title=%E0%B8%81%E0%B8%B2%E0%B8%A3%E0%B8%9A%E0%B8%A3%E0%B8%B4%E0%B8%AB%E0%B8%B2%E0%B8%A3%E0%B8%87%E0%B8%B2%E0%B8%99%E0%B8%A0%E0%B8%B2%E0%B8%84%E0%B8%A3%E0%B8%B1%E0%B8%90%E0%B9%81%E0%B8%99%E0%B8%A7%E0%B9%83%E0%B8%AB%E0%B8%A1%E0%B9%88&oldid=11053>.
27. Rangsiyokrit S. The government's structure. Bangkok: Central Welfare Office; 1997.
28. Cameron KS, Quinn RE. Diagnosing and changing organizational culture. Reading: Addison Wesley Longman; 1999.
29. Srithong E. The university's ranking; the mirror of higher education quality. *Matichon Daily*. February 27, 2005, p. 10.