Identifying Strength and Weakness of Sustainable Higher Educational Assessment Approaches

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Abstract

Sustainable Higher Education (SHE) is regarded as one of the most influential medium of facilitating sustainable development movement in the world. SHE assessment approaches are tools or frameworks which assesses the level of sustainability in higher educational institutions. There have not been any comprehensive studies related to the existing sustainable assessment approaches. It is a relevant issue which merits a proper study to evaluate both the strengths and weakness of those SHE assessment approaches. Archival research technique, content analyses as well as interview were utilized to address this objective. Archival research technique was employed to facilitate the investigation of documents and textual materials in the realm of SHE assessment approach from 12 years starting from 1998. Content analyses were utilized as the research technique which quantify and analyzes the meanings and relationships of concepts and finally interview was employed to validate those two techniques. Comprehensiveness, popularity, novelty, conforming Three Bottom Line (TBL) theory and avoiding Subjective Judgment were the main criteria of evaluation. The study has identified 18 popular SHE assessment approaches out of which Sustainability Tracking and Assessment Rating System (STARS) and Campus Sustainability Assessment Framework (CSAF) were found out to have more strength in comparison of other SHE assessment approaches. The finding can be used for the higher educational institutions which aim to assess the level of SHE in their institutions.

Key phrases: SHE, Assessment approaches, TBL, CSAF, STARS, TSJ

1. Introduction

Sustainable Development (SD) is popularly described as "a development that meets the needs of the present without compromising the ability of the future generations to meet their own needs" (Brundtland, 1987: 19). Internationally, SD is being considered as an important part of the future well-being of the world (Saadatian et al, 2009). Higher Educational Institutions (HEI) has been identified as among the key institutions that can contribute to more environmentally friendly issues, as well as proposing solutions for the future sustainability (Johns et al, 2008). SHE is a global concern for university decision makers as a result of the realization of the impacts of universities operations over the environment (Alshuwaikhat, Abubakar, 2008). University campuses have been fundamentally effectual in discovering the growing crisis facing the world. Calls for reconciliation of human society and the natural world have come from all corners of the academic world (ibid).

The importance of HEI is that; faculty students and academicians involved in HEI are or will be the leaders of the society. Hence, everybody would expect the universities, which houses these people to be future world runners to be more sustainable (Boks and Diehl, 2006). What is important in this realm of this science is capability of assessing SHE which enable the decision makers to realize whether they are driving the HIE towards or away in embracing sustainable concepts. Therefore a new terminology evolves which is called SHE assessment approaches. Those are frameworks, tools, questionnaire kit tools, checklists, which enable a HEI to assess the level of SHE. Since there are yet any comprehensive studies pertaining to the existing sustainable assessment approaches. It is necessary to identify the popular SHE assessment approaches and to evaluate both their strengths and weakness.

2. Setting Criteria of Strength and Weakness

In order to assess the strength and weakness of any subject it is necessary to set bench marks and scale. For this purpose; two theories and three criteria were taken by this research as the base of evaluation. Theory of 'Triple Bottom Line "TBL", Theory of Avoiding Subjective Judgment, Criterion of Comprehensive, Criterion of Novelty, Criterion of Popularity were set as the scale of judgment.Theory of 'Triple Bottom Line "TBL" which was coined by Elkington in 1994, in a practical term, means including ecological and social performance in addition to financial performance in particular organization (Filho and Carpenter, 2006). In other words, it imparts that a development is considered sustainable which contains all three pillars of SD namely social development, economic development and environmental development simultaneously or considers the "people, planet, profit" phrase.

Since there is no restriction in the realm of any research to apply different theories even from other major of studies and even the importance of psychology in education has been stressed (Ogden, 1999), and SHE covers educational subjects as well, the research has applied a theory of physiology focusing on subjective judgment. William James in 1915 coined this theory of avoiding Subjective Judgment, which depicts that many of human beings judgments are based on their own understanding, which is considered subjective judgment (Connolly et al, 2000). This subjective judgment is mostly full of errors and scientist should not rely on these finding (ibid). Therefore, this research took "avoiding subjective assessment" as the other scale in selecting of SHE approaches. The first criterion, which was taken as the base of selection, was comprehensiveness. It means that the approach should be comprehensive and include all aspects of sustainability for HEI. The second criterion was set as novelty, that stemmed from having new information and latest knowledge of SHE. The last criterion was popularity, which indicates in which degree the scholars are acquainted with those specific approaches.

3. Study Method

Archival research technique was employed to facilitate the investigation of documents and textual materials in the realm of SHE assessment approach. In most classic sense, archival methods are those that involve the study of historical documents (Jackson, 2007). Therefore an archival research method was conducted over different SHE dissertations; SHE approaches and SHE articles for the time span of 12 years starting from 1998. The objective of this part was to identify international SHE assessment approaches. The documents which were analyzed were articles, PhD and Master dissertations, guidelines and frameworks which discussed about SHE, AASHE bulletin, and related journals. Content analyses were utilized to analyze the strength and weakness of those approaches. Content analyses as the research technique which quantify and analyzes the, meanings and relationships of concepts has been cited as an appropriate method of qualitative researches (Krippendorff, 2004). A content analyses protocol was developed in four clauses as a protocol. Those were; 1-selecting type of analyses; which conceptual analyses was chosen as the selected type of analyses, 2-establishing the concept; which two theories of TBL and TSJ and three criteria of novelty, comprehensiveness and popularity were established as the main concepts of analyses, 3-analyses; the analyses was based on meaning, and 4- report.

Interview techniques were the third technique of study method which International Scholars in SHE were interviewed. The purpose of this interview was to validate the content analysis finding. In this regard a structured, close ended, telephone interview were carried out on 10 SHE scholars from 10 universities in the year 2008 (See table 1). The interviewees were selected among the university staffs who had a positions like coordinator of sustainability or had published a journal article in one of SHE's journals. The names of the interviewees were kept confidential on request due to the restriction of their professional career. An interview protocol was made to prevent the wrong interpretation and bias in the procedure of study following up the guideline of Kvale (2007) in seven steps. Those were; step one: "thematization the interview"; which was formulating the purpose of interview, step two: design the interview questions, step three: conducting the interview (inclusive of getting permission, tape recording or writing), step four: transcript of recording verbatim, step five: analyses; this study utilized "Interview analyses focusing on meaning" as the style of interpreting and the "Meaning Condensation" as the mode of interpretation which is "very prevalent and valid technique in analyzing the interview" step six: verifying; which is checking the reliability of the analyses. In this regard, the research verified the analyses of interview by resending the interpretation to interviewees via email or calling and finally step seven was: reporting (Kvale, 2007, P108).

In this research, sampling in interview followed the saturation point theory since the objective is to identify the overall opinion of experts and there is a fact that the interview is a form of the qualitative research and the issue of sampling is therefore not very significant and thus, it is better to employ saturation method (Kumar, 2007). This means that in a qualitative research, it is not necessary to determine the extent of the diversity, while the qualitative aspect only supports the content analyses.For assessing the popularity of this approach on line search engine has been utilized to investigate the popularity of these approaches. The number of the hits in cyber space has been introduced as potential index of popularity (Khosla et al, 2005). For this purpose during the time span of one year every month four times starting form Jan 2008- Jan 2009 the number of hits of keying in the names of those SHE approach in Google were recorded (See figure 1).

Table 1: Affiliation of interviews

No	*Name of HEI*	*Position of Interviewee*	*Date and Time of in Interview*
1	National University of Singapore	Author of papers and researcher of Environmental Research Institute	13 March 2008- 10:50 am
2	The University of Hong Kong	Expert involved in Planning new Centennial Campus Development Project (HONG KONG Sustainable Campus)	21 July 2008 14:30-14:50
3	University of Arkansas	Sustainability expert	27 July -21:20-21:50 am
4	The University of British Colombia	Sustainability expert	25 April, 21:50-22:20
5	University of Toronto Scarborough	Sustainability expert	24 May 2008, 21:30-22
6	Cornel University	Expert in sustainability and activist in climate action plan	26 May 2008 23:30-24
7	Waterloo University	Expert of Greening Waterloo Project	21 Aug 2008 23:30-24
8	University of Red lands	Author and researcher of Environmental study department	27 Aug 2009 24:30-24-55
9	The University of Texas at Austin	Expert of centre of Sustainable Development	5 September 2008 24:24:20
10	King Fahad University of Petroleum and Mineral resources	Author, Researcher	24 Sep 2008, 14:20-14:45

4. Result and Discussion

This section discusses about the result of archival technique**,** result of on-line Research Engine, content analyses as well as interview. 17 approaches has been discussed and analyzed. In order to shorten this manuscript, those approaches were given a name number and were repeated based on their numbers (see table 2).

4.1 Result of Archival Technique

The archival research identified 17 SHE assessment approaches (See table 2). These 17 approaches are among the well known assessment approaches which are being used in various universities all around the world.

Table 2: Different SHE assessment tools

	Name of Approach./ Assessment Tools for SHE
1	An environmental audit in university California Los Angeles Approach
2	University Leader for Sustainable Future (ULSF) questionnaire tool Approach
3	Maclean's Annual Magazine Guide to Canadian Universities Approach
4	Alternatives Missing Pieces Reports I, II, and III Approach
5	Penn State Indicators Report Approach
6	Draft List of Environmental Performance Indicators Approach
7	An Environmental Assessment Method for Community (EAMC)
8	Good Company's Sustainable Pathways Toolkit,
9	National Wildlife Federation's State of the Campus Environment Questions and Answers Approach
10	Campus Sustainability Assessment Review Project (CSARP)
11	Campus Sustainability Assessment Framework
12	Sustainable Assessment Framework for Waterloo University
13	Knowledge for sustainable Development Assessment in MC Gill
14	Campus Sustainability Selected Indicators Snapshot and Guide
15	Multi-Criteria Analysis (MCA): A Tool for Sustainability approach
16	Auditing Instrument for Sustainability in Higher Education (AISHE)
17	STARS (Sustainability Tracking and Assessment Rating System

4.2 The result of Content Analyses

This part explains the result of content analyses of those 17 SHE assessment approaches. A brief explanation has been depicted about those assessment approaches in following part. An Environmental Audit in University California Los Angeles Approach 1988 is one of the oldest SHE assessment approaches. This approach is very simple and contained Waste, Runoff, Pesticide use, Water use, Energy use, Procurement, and the Workplace environment (Smith and Gottlieb, 1989). UCLA's audit is a primitive approach, which only addresses the environmental issues.ULSF Questionnaire Approach (1992) is the second approach of this study (ULSF, 1992). It has a strong concentration on SHE definition and is straightforward questionnaire, there is no need for intensive data collection, and facilitates dialogue among people However this approach is very subjective rather than objective. This misses also many possible social, economic, and environmental indicators**.**Maclean's Annual Magazine Guide to Canadian Universities Approach (1999) is the third approach. It covers only some limited issues and is not a comprehensive assessment method (Cole and write, 2005). There is doubt in its ability to conduct a survey with rigorous, accurate and useful information. Many universities even in Canada, like University of Calgary, McMaster University and the University of Toronto refused to join to their ranking (ibid).

Alternatives Missing Pieces Reports I, II, and III Approach (2000) is the forth approach (Canadian Center for Policy Alternative, 2000). It focuses only in social aspects of SHE but its domain is larger than the previous one. It comprises the issues like educational quality, equity, accessibility, affordability, opportunity, public accountability. However, it lacks the ecosystem's issues and many other social issues. Besides, ranking is provincial rather than institutional level and the procedure of ranking is not enough transparent. Penn State Indicators Report Approach (2000) is the fifth approach (PSU, 2000). It covers 10 different issues including, Energy, Water, Material (recourse and disposal), Food, Land, Transportation, Built Environment, Community, Research, and Decision-making. It employs a team of 30 students and several professional to fulfill this assessment tool. However in coverage of issues like; Air, health, Wealth and Governance is weak. It has only presented five indicators for community namely ecological literacy, technology, student crime, student alcohol consumption, student depression. It lacks the indicators, which address diversity, involvement, and services.Draft List of Environmental Performance Indicators Approach (2001) is the six approach. It solely contains environmental issues. It misses many potential indicators and some of the indicators were too general to be considered objective indicators.

An Environmental Assessment Method for Community (EAMC) Approach, (2002) is the seven approach of this study (Sharma, 2002). It is a comprehensive, simple, easy to use tool. However, it has used Environmental Impact Assessment (EIA) as the sole methodology for proving its finding which only considers environmental sustainability issues. There is a big challenge that environmental indicators, solely, could not be a proper indicator for sustainability. Good Company's Sustainable Pathways Toolkit, (GCSP) Approach was coined in 2002(GCSP, 2002). It lacks of detail, limited consultation with campus experts and not being comprehensive is its deficiency. Besides, there is not any clear theoretical framework that had been conceptualized in this approach which some scholars such as Franz-Balsen and Heinrichs (2007) cited it as the essential ingredient of an adequate sustainability communication management tool.National Wildlife Federation's State of the Campus Environment Questions and Answers Approach (2002) is a Canadian approach. It has focused on environmental issues and the procedure of turning indicator performance into a grade score and to aggregating indicator is not transparent (Shriberg, 2002). The ranking process is too generous where 60 % of American campus got A in their assessment in 2003 which is a contradiction of unsatisfactory level of sustainability in HEI. The process is slightly subjective and is not very comprehensive.

Campus Sustainability Assessment Review Project (CSARP) approach (2003) is also a Canadian approach. It is a comprehensive, extensive, highly analytical assessment approaches (Glasser et al, 2003). The weakness of this assessment method is that there is no interview input, no benchmark, no link between this tool and effect on decision makers. There is no strong conceptualized theoretical frame work in it and its assessment in some cases is subjective.Campus Sustainability Assessment Framework, (CSAF) Approach, (2003) is also another Canadian Approach. It contains 10 sections (water, materials, air, energy, land; health and wellbeing, community, knowledge, governance, economy and wealth) which address a total of 169 (Cole, 2003, Breinger, 2006). This tool has used PAR method which is a strong methodology. There is a clear theoretical frame work and a clear definition of SHE in this approach. The indictors are mostly objective rather than subjective.

Sustainable Assessment Framework for Waterloo University Approach, (2005) is modified version of CSAF. It is a useful, Practical approach which uses bench marking, and stakeholder's opinions (Legacy, 2005). The weakness of this assessment approach is that lack some indicators and is only focusing is a small portion of ongoing SHE issues.Knowledge for sustainable Development Assessment in MC Gill Approach is also another modified CSAF (Lam et al, 2005). It is a very simple and transparent however addresses only one aspect of the campus sustainability issues which is knowledge.Campus Sustainability Selected Indicators Snapshot and Guide (CSSISG) approach is another approach which was used in 2006 (NJHEPS, 2006). It has managed to avoid subjective indicator, it has been designed for assessing the SHE but it focuses mostly in environment. It lacks social and economic indicators and many indicators have been missed even in environmental aspect.Multi-Criteria Analysis (MCA): A Tool for Sustainability approach, (2007) focus in environmental issues and ignoring social and economic issues besides its perspective is management rather than the whole rubrics of SHE.

Auditing Instrument for Sustainability in Higher Education is another approach (AISHE, 2008). It has been constructed on the strong foundation of "Plan, Do, Check, and Act. However it misses many issues, like operations, research, finance, governance. It relies only on subjective experiences and focuses more in academic activities rather than all issues. AISHE is related to educational goals, process and outcome. Its focus is environmental issues and educational goal. Sustainability Tracking and Assessment Rating System is the last approach (STARS, 2010). It is a simple, explicit and good assessment tool. It has not categorized the indicators based on ecosystem and people and follows its own grouping. There is not an explicit definition of SHE and a clear theoretical framework.

4.3 Result of On-line Research Engine technique

The result of the on line search engine for investigating the popularity is depicted in this part (See figure 1).

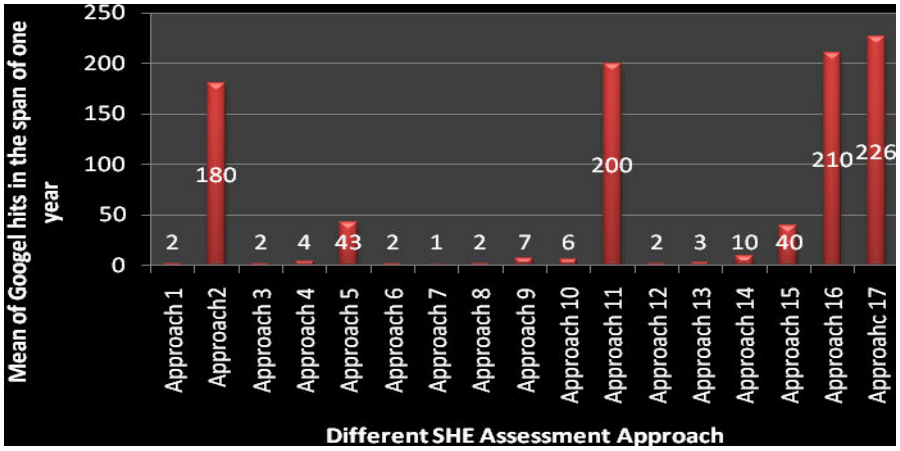

Figure 1: Result of Popularity of SHE Approach
(Number of approches follows numbering of table 1)

4.4 The Summary of Content Analyses

Table three imparts the summary of content analyses in line of criteria of strength which was elaborated in section 2. In this table H= High, M=Medium, L= Low, however in the column of Novelty, High = Latest than 2005, M= between 2005- 2000, Low= before 2000. The details of these marking was elaborated in figure 1, and section 4-2.

Table3: Strength and Weakness of SHE Approaches Based on Three Qualitative Techniques

No	*Satisfy TBI*	*Satisfy TSJ*	*Comprehensiveness*	*Novelty*	*Popularity*	*Description*
1	L	M	L	L	L	
2	M	L	L	L	H	
3	L	M	M	M	L	
4	L	L	M	M	L	
5	H	H	L	M	M	
6	L	M	M	M	L	
7	L	H	H	M	L	
8	L	M	L	M	L	
9	L	L	L	M	L	
10	M	L	H	M	L	
11	H	H	M	M	H	
12	L	H	H	H	L	
13	L	H	H	H	L	
14	L	H	H	H	L	
15	M	H	M	H	M	
16	L	L	M	H	H	
17	H	M	M	H	H	Ver5- pilot -2008

4.4.1 Coding

In order to turn qualitative data to numbers, this research has employed coding technique whereby; V=Σ Vi which V is total values of each approach and vi is the value of each column in a specific approach and Vi; H=3, M=2, L=1. For instance in the first approach; V1=1+2+1+1+1=5

The summary of all approaches based on content analyses has been written in table below.

Table 4 summary of all approaches based on archival analyses

Table 4: Coding content analyses result

Number of Approach	*Total values (V)*
1	5
2	8
3	8
4	7
5	11
6	8
7	10
8	7
9	6
10	9
11	13
12	11
13	11
14	11
15	12
16	9
17	13

4.5 Result of Interview of International Experts of SHE

The result of interview indicted that; 1- In terms of popularity the interview technique validated on line search engine whereby Approach 2, 11, 16, 17 are the most well known assessment approaches and approach 5 and approaches 15 were known as the second place. Besides it was understood that the Canadian universities are more familiar with, firstly, Canadian SHE assessment Approaches and second American SHE assessment approaches and American were found to be acquainted with first American SHE assessment approaches and second Canadian SHE assessment approaches respectively (See table 3 and 4). For transferring qualitative data to quantitative data coding technique was utilized. For popularity, level of familiarity has been taken as an index.Popularity Index (PI) =Σpi/ n, which pi is the value of each approach based on one interview and its value is considered 0= little, 1= Medium and 2= highly and n is number of approaches.

For coding comprehensiveness part the Likert scales answers were translated in to numbers which strongly agree=5, Agree = 4, Neutral= 3, Disagree= 2 and strongly Disagree=1. The result of the interview was coded and feed to SPSS for descriptive data analyses. Table five, demonstrate the results.

Table 5 Result of Coding Techniques by SPSS

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std.	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Index of Popularity for approach1	10	1.00	.00	1.00	.2000	.42164	1.779	.687
Trippel Bottom Line for Approach1	2	.00	1.00	1.00	1.0000	.00000	.	.
Theory of Subjective Justice for approach1	2	1.00	3.00	4.00	3.5000	.70711	.	.
Comprehensve in Approach1	2	.00	2.00	2.00	2.0000	.00000	.	.
Index of Popularity for approach2	10	1.00	1.00	2.00	1.9000	.31623	-3.162	.687
Trippel Bottom Line for Approach2	10	1.00	3.00	4.00	3.5000	.52705	.000	.687
Theory of Subjective Justice for approach2	10	2.00	1.00	3.00	1.8000	.63246	.132	.687
Comprehensve in Approach2	10	1.00	2.00	3.00	2.3000	.48305	1.035	.687
Index of Popularity for approach3	10	1.00	.00	1.00	.3000	.48305	1.035	.687
Trippel Bottom Line for Approach3	3	.00	2.00	2.00	2.0000	.00000	.	.
Theory of Subjective Justice for approach3	3	.00	3.00	3.00	3.0000	.00000	.	.
Comprehensve in Approach3	3	1.00	2.00	3.00	2.6667	.57735	-1.732	1.225
Index of Popularity for approach4	10	1.00	.00	1.00	.3000	.48305	1.035	.687
Trippel Bottom Line for Approach4	3	1.00	1.00	2.00	1.6667	.57735	-1.732	1.225
Theory of Subjective Justice for approach4	3	2.00	1.00	3.00	2.0000	1.00000	.000	1.225
Comprehensve in Approach4	3	2.00	2.00	4.00	3.0000	1.00000	.000	1.225
Index of Popularity for approach5	10	2.00	.00	2.00	.9000	.56765	-.091	.687
Trippel Bottom Line for Approach5	8	1.00	3.00	4.00	3.7500	.46291	-1.440	.752
Theory of Subjective Justice for approach5	8	1.00	3.00	4.00	3.6250	.51755	-.644	.752
Comprehensve in Approach5	8	1.00	2.00	3.00	2.7500	.46291	-1.440	.752
Index of Popularity for approach6	10	1.00	.00	1.00	.4000	.51640	.484	.687
Trippel Bottom Line for Approach6	4	1.00	1.00	2.00	1.2500	.50000	2.000	1.014
Theory of Subjective Justice for approach6	4	1.00	3.00	4.00	3.5000	.57735	.000	1.014
Comprehensve in Approach6	4	1.00	3.00	4.00	3.2500	.50000	2.000	1.014
Index of Popularity for approach7	10	2.00	.00	2.00	.2000	.63246	3.162	.687
Trippel Bottom Line for Approach7	1	.00	2.00	2.00	2.0000	.	.	.
Theory of Subjective Justice for approach7	1	.00	5.00	5.00	5.0000	.	.	.
Comprehensve in Approach7	1	.00	5.00	5.00	5.0000	.	.	.
Index of Popularity for approach8	10	1.00	.00	1.00	.4000	.51640	.484	.687
Trippel Bottom Line for Approach8	4	1.00	2.00	3.00	2.2500	.50000	2.000	1.014
Teory of Subjective Justice for approach8	4	2.00	2.00	4.00	3.0000	.81650	.000	1.014
Comprehensve in Approach8	4	1.00	2.00	3.00	2.5000	.57735	.000	1.014
Index of Popularity for approach9	10	1.00	.00	1.00	.1000	.31623	3.162	.687
Trippel Bottom Line for Approach9	1	.00	2.00	2.00	2.0000	.	.	.
Theory of Subjective Justice for approach9	1	.00	2.00	2.00	2.0000	.	.	.
Comprehensve in Approach9	1	.00	2.00	2.00	2.0000	.	.	.
Valid N (listwise)	0							

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std.	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Stdl. Error
Index of Popularity for approach10	10	1.00	.00	1.00	.3000	.48305	1.035	.687
Trippel Bottom Line for Approach10	3	1.00	3.00	4.00	3.6667	.57735	-1.732	1.225
Theory of Subjective Justice for approach10	3	1.00	2.00	3.00	2.3333	.57735	1.732	1.225
Comprehensve in Approach10	3	1.00	3.00	4.00	3.6667	.57735	-1.732	1.225
Index of Popularity for approach11	10	1.00	1.00	2.00	1.5000	.52705	.000	.687
Trippel Bottom Line for Approach11	10	3.00	2.00	5.00	3.8000	.91894	-.601	.687
Theory of Subjective Justice for Approach11	10	3.00	2.00	5.00	3.7000	.82327	-.806	.687
Comprehensve in Approach11	10	2.00	3.00	5.00	3.8000	.63246	.132	.687
Index of Popularity for Approach12	10	3.00	.00	3.00	.5000	1.08012	1.984	.687
Trippel Bottom Line for Approach12	1	.00	2.00	2.00	2.0000	.	.	.
Theory of Subjective Justice for approach12	1	.00	5.00	5.00	5.0000	.	.	.
Comprehensve in Approach12	1	.00	5.00	5.00	5.0000	.	.	.
Index of Popularity for approach13	10	1.00	.00	1.00	.1000	.31623	3.162	.687
Trippel Bottom Line for Approach13	1	.00	2.00	2.00	2.0000	.	.	.
Theory of Subjective Justice for approach13	1	.00	4.00	4.00	4.0000	.	.	.
Comprehensve in Approach13	1	.00	4.00	4.00	4.0000	.	.	.
Index of Popularity for approach14	10	1.00	.00	1.00	.3000	.48305	1.035	.687
Trippel Bottom Line for Approach14	3	1.00	2.00	3.00	2.3333	.57735	1.732	1.225
Theory of Subjective Justice for approach14	3	1.00	3.00	4.00	3.3333	.57735	1.732	1.225
Comprehensve in Approach14	3	1.00	3.00	4.00	3.3333	.57735	1.732	1.225
Index of Popularity for approach15	10	2.00	.00	2.00	.9000	.73786	.166	.687
Trippel Bottom Line for Approach15	7	2.00	2.00	4.00	3.2857	.75593	-.595	.794
Theory of Subjective Justice for approach15	7	2.00	3.00	5.00	3.7143	.95119	.764	.794
Comprehensve in Approach15	7	1.00	3.00	4.00	3.1429	.37796	2.646	.794
Index of Popularity for approach16	10	2.00	.00	2.00	.5000	.70711	1.179	.687
Trippel Bottom Line for Approach16	4	1.00	2.00	3.00	2.2500	.50000	2.000	1.014
Theory of Subjective Justice for approach16	4	1.00	2.00	3.00	2.5000	.57735	.000	1.014
Comprehensve in Approach16	4	1.00	3.00	4.00	3.5000	.57735	.000	1.014
Index of Popularity for approach17	10	1.00	1.00	2.00	1.8000	.42164	-1.779	.687
Trippel Bottom Line for Approach17	10	3.00	2.00	5.00	4.0000	.81650	-1.531	.687
Theory of Subjective Justice for approach17	10	1.00	3.00	4.00	3.7000	.48305	-1.035	.687
Comprehensve in Approach17	10	1.00	2.00	3.00	2.8000	.42164	-1.779	.687
Valid N (listwise)	0							

It is being observed that only approaches number 2, 11, 16 and 17 which their means of index of popularity are; (1.90), (1.5), (1.7), (1.8) have the biggest values in terms of popularity and approaches number 5 and 15 have the mean of popularity index of .9 comes in the second level of value. The mean value of remainder of the approaches ranges from 0.1 to 0.6, which comes in third level.

The result of interview indicates that; approaches number 5, 11 and 17 have the biggest mean values of TBI ranging from (3.75), (3.8), and (4) in first place and approaches 2, 10 and 15 have the mean values of TBI ranging of (3.5), (3.6) and (3.3) comes in the second place and the remainders which have the mean values of TBI ranging from (2.8) to (1.2) comes in the third level of value.

The results of interview indicates that in terms of avoiding subjective judgment or TSJ the biggest means values belongs to approaches numbers 5,7,11,12,13,14,15 which have (3.62), (3.7),(5),(4), (3.7), (3.5) and (4). And approaches mean value of TSJ of approaches number 1, 3, 6, 8 and 17 comes in the second level .The same interpretation has been employed for comprehensiveness (See table 6).

Table 6: Result of Coding Interview for Evaluating SHE Approach

No	Satisfy TBI	Satisfy TSJ	Comprehenstiveness	Popularity
1	L	M	L	L
2	M	L	L	H
3	L	M	M	L
4	L	L	M	L
5	H	H	L	M
6	L	M	M	L
7	L	H	H	L
8	L	M	L	L
9	L	L	L	L
10	M	L	H	L
11	H	H	M	H
12	L	H	H	L
13	L	H	H	L
14	L	H	H	L
15	M	H	M	M
16	L	L	M	H
17	H	M	M	H

The result of interview shows that there is not a big significant difference between finding of archival method and interview.

5. Conclusion

The research concludes that based on table1, 2, 3,4,5,6 and figure 1 that "STARS" and "CSAF" score the highest and at the top level of satisfying the criteria of novelty, comprehensiveness, popularity, TBL and TSJ. However, "Penn State Indicators Report Approach", "Sustainable Assessment frame work for Waterloo University", "Knowledge for sustainable Development Assessment in MC Gill", "Campus Sustainability Selected Indicators Snapshot and Guide" and "Multi-Criteria Analysis (MCA): A Tool for Sustainability Approach" comes after those two in the second top level of the table. Moreover, "An Environmental Assessment Method for Community (EAMC)" comes in third top, and "Campus Sustainability Assessment Review Project (CSARP) and "Campus Sustainability Assessment Framework" come in the fourth top, and "ULSF questionnaire tool Approach", "Maclean's Annual Magazine Guide to Canadian Universities Approach", and "Alternatives Missing Pieces Reports I, II, and III Approach" come in the fifth top respectively.

In contrast, "An environmental audit in university California Los Angeles Approach" is at the first bottom level of satisfying those criteria, and "National Wildlife Federation's State of the Campus Environment Questions and Answers Approach" comes at the second bottom and "Alternatives Missing Pieces Reports I, II, and III Approach" comes at the third bottom of the table meantime "ULSF questionnaire tool Approach", "Maclean's Annual Magazine Guide to Canadian Universities Approach" and "Draft List of Environmental Performance Indicators Approach" come at fourth bottom of the table. The finding of this research is only based on five limited specific criteria and does not intend to rank those assessment approaches. It goes without saying if the criteria are altered the hierarchy of those assessment approaches will be changed respectively. Moreover, if an assessment approach is at top of the table does not mean it is the best or the most functional approach. It is also noted that the assessment methods can only be applied if there are enough resources and inputs to assess. Therefore it is necessary to tailor or adapt and adopt the chosen methods to the local conditions.

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