

A POCKET OF EQI

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ABSTRACT

Environmental Quality Index (EQI) represents four domains of environment; air, water, noise and light. This indexes is significant in translating a wide variety of environmental indicators into a simple system that can easily be communicated. Based on a survey carried out to 50 students of EVA631 with regards to their learning difficulties, it was found out that, one of the major problem on their learning is difficulties to access to various environmental indexes during classes. Furthermore, to date, there is an absence of a pocket book that compiles the index of all the quality domain. Therefore, the aim of this pocket book is to provide an easy quick reference to the students in referring to various EQI. In order to better understand students perceptions towards this pocket book, a survey was carried out towards 50 students of EVA631 and the findings reveal that, overall, students satisfied with the content of the pocket book. With this innovative idea, it is hoped that students will be able to be more focus on their learning especially in the era of Covid-19 pandemic.

Keywords: pocket book, environmental, quality, index, air, water, noise, light

1.0 INTRODUCTION

The use of teaching and learning materials (T&L) can make a teaching process and learning becomes more effective to students. According to Ahmad Zanzali, N.A & Daud, N.D (2010), variation in teaching aids are an important aspects to attract students and enhance their understanding during the teaching and learning process. A pocket book or a reference book is seen as one of the conventional methods of reference however the positive impact gain from the usage of handbook is undeniable. This handbook of Environmental Quality Index is intended to assist the students of EVA 631 and ADS667. EVA 631: Environmental Health and Security and ADS667: Practical training is two compulsory course that must be taken by all students of Degree in Environmental Administration, University Technology MARA.

2.0 PROBLEM STATEMENT

A survey was carried out to 50 students of EVA631. This survey intended to understand the problems faced by the students that hinder their learning process in class. The findings from the survey reveals that, the major problem students faced in class is difficulties to access to various environmental index (Table 1.1). Students need to browse through different websites of Department of Environment (DOE) and Department of Occupational Safety and Health (DOSH) each time they need relevant information pertaining to the issues of environmental quality. With this amount of feedback from the students, this pocket book was then developed.

Table 1.1: Student learning problem in class

Items	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)	Mean Score
1 Does EVA631 subject need some form of practical training outside of class?	40	4	6	0	0	4.68
2 Do you face difficulties in accessing to any environmental index?	48	2	0	0	0	4.96
3 Do you need fieldwork assignments to better understand the subject of EVA631?	45	3	2	0	0	4.86
4 Do you find difficulties to find EVA631 reference materials in the market?	44	4	2	0	0	4.84
5 Do you find it difficult to understand the syllabus of EVA631?	42	4	4	0	0	4.76

3.0 LITERATURE REVIEW

Basically, the content of this book mainly focused on Environmental Quality Standard (EQS). Environmental Quality Standard (EQS) is a concept for which there is no uniform definition in the legislative systems around the world. The term EQS is mostly used in Europe, while in the United States and Canada the terms Ambient Water Quality Criteria and Water Quality Guidelines, respectively, are used. In any case, when set in legislation, they are legally binding limits and are translated into concentrations of individual substances. EQS is an environmental medium quality standard for specific substances, which sets concentration thresholds below which, no adverse impact on the medium occurs, and which takes explicit account of available dilution at different discharge locations (P. Whitehouse 2001).

A World Health Organization (WHO) report states that in 2012, seven million deaths were caused by air pollution worldwide (WHO, 2014). Studies have shown that fine particulate pollution (PM2.5) is highly correlated with population mortality and morbidity (Shen et al., 2017). The AQI is a dimensionless index that quantitatively describes the status of air quality. The sub-AQI of the six criteria pollutants (PM2.5, PM10, SO2, CO, NO2, and O3) were first calculated with the observation concentrations (Kaijie Xu et al., 2020).

Initially, WQI was developed by Horton (1965) in United States by selecting 10 most commonly used water quality variables like dissolved oxygen (DO), pH, coliforms, specific conductance, alkalinity and chloride etc. and has been widely applied and accepted in European, African and Asian countries. The assigned weight reflected significance of a parameter for a particular use and has considerable impact on the index. Furthermore, a new WQI similar to Horton's index has also been developed by the group of Brown in 1970, which was based on weights to individual parameter. Recently, many modifications have been considered for WQI concept through various scientists and experts.

Noise level is the fundamental measure used subsequently to construct scales and indices. The objective is to obtain a physical measure of sound level that correlates well with the subjectively assessed noisiness of the sound. Experience has shown that the measure should emulate the variation of sensitivity with frequency of the human hearing system. Clearly for most noise sources, the level will vary with time although in defining a noise level, time is not included in the description. The 'A' weighted level is the most commonly quoted noise level used in environmental acoustics. Noise levels measured using 'A' weighting are normally expressed as L dB(A) or more commonly these days as LA dB. Noise scales combine noise level with time in some way. This may be the level exceeded for a given proportion of time, as in LA10 dB, or it might be an integration of level with respect to time, as in LAeq dB. Other forms have also been quoted in the literature but are less commonly used in a transport context. Noise indices or ratings are created to provide an evaluation of noise in particular circumstances. Most commonly, indices are formed from the noise scales by merely defining the time period over which the scale applies. For example the LA10,18h dB index refers to the specific time of day over which the noise scale should be averaged. A similar index in common use is the LAeq,24h dB which integrates the values of LAeq over a complete day (P G Abbott and P M Nelson 2002).

Light is an important external cue for adjusting humans' circadian rhythm or internal clock: this is known as Non Image-Forming (NIF) effects of light J. A. Veitch (2002). People nowadays spend more than 90% of their lifetime in an indoor environment. In this situation, the light induced circadian rhythm entrainment differs considerably from the natural stimulation, especially for people working far away from building facades or during night time. Lack of proper entrainment of circadian rhythm due to insufficient light stimulation is responsible for serious health issues, like sleep deprivation and depression; it reduces productivity and alertness, an undesirable socio-economic burden for the country. Proper assessment of the light flux received by the eyes of building occupants is an important step toward characterizing and mitigating this issue. It was showed, under controlled conditions (K. Kaida et al. 2006), that 30 minutes of exposure to a bright daylight near windows (with a pupillary illuminance ranging from 1000 to 4000 lux) was almost as effective as a short nap in reducing normal post lunchtime drowsiness in healthy subjects. Several authors contributed to determine the sensitivity threshold of the circadian system: they demonstrated that the human circadian pacemaker phase shifts are responding to relatively low illuminance levels for a broadband spectrum white light source (~100 lux at the cornea or 300-500 lux on the horizontal plane). Later on, it was shown that a pupilar illuminance ranging from 50 to 100 lux can affect the circadian system of humans in laboratory settings (IES 2016).

4.0 MATERIALS AND METHODS

According to Sabitha Marican (2006), survey questionnaires that have reliability of greater than 0.7 can be used as a measurement item in a study. The analysis was performed using Cronbach's Alpha from the Statistical Package for the social science (SPSS) software. A survey was conducted to 50 students of EVA 631. This survey is conducted in order to capture the first hand perception towards this book after 3 months of usage. Likert scale format was used in the questionnaire 1 up to 5 (1 = strongly disagree and 5 = strongly agree). The list of items are as follows (Table 1.2):

Table 1.2 List of questionnaire items

Item Number	Questions
1.	This book contains the aspects of knowledge I need
2.	The facts in this book are accurate
3.	The language used is easy to understand
4.	The front page of the book is interesting and creative
5.	The organization of this book is clear and systematic
6.	Text integration and graphic used in this book is appropriate in conveying information
7.	I am satisfied with the book

5.0 RESULTS AND DISCUSSION

In general, students have positive perception towards the content of the book with the mean of 4.54 (Table 1.3). However, there are also 3 respondents who have neutral feelings on the content of the handbook. Majority of the students also strongly agree that the facts in this book is accurate with the mean score of 4.92. Moreover, students also agree that the use of language is easy to understand with a mean score of 4.38. Students also agreed that the front page of the book is interesting and creative with a mean score of 4.64. However, there are 4 respondents who have neutral feeling on this. In terms of organization of the book, students agreed that the organization of this book is clear and systematic. Students also agreed that text integration and the use of graphic in this book is appropriate with a min score of 4.92. Overall, a mean score 4.96 was observed on the overall satisfaction towards the book.

Table 1.3 Findings of Mean Score

Items	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)	Mean Score
1. This book contains the aspects of knowledge I need.	43	3	4	0	0	4.54
2. The facts in this book are accurate.	47	2	1	0	0	4.92
3. The language used is easy to understand.	43	7	0	0	0	4.38
4. The front page of the book is interesting and creative.	36	10	4	0	0	4.64
5. The organization of this book is clear and systematic.	48	2	0	0	0	4.96
6. Text integration and graphic used in this book is appropriate in conveying information.	46	4	0	0	0	4.92
7. I am satisfied with the book.	48	2	0	0	0	4.96

6.0 CONTRIBUTION AND USEFULNESS/COMMERCALISATION

This pocket book intended to assist the students who of EVA 631: Environmental Health and Security subject and students of Practical Training ADS667 This pocket book is useful to the students as a quick and easy reference. Previously, students need to browse through different websites of Department of Environment (DOE) and Department of Occupational Safety and Health (DOSH) each time they need relevant information pertaining to the issues of environmental quality. This handbook is therefore appropriate in supporting students' learning and education development. Nevertheless, lecturers could also use this handbook as one of the teaching and learning strategy.

This pocket book is prepared in two version which are physical handbook and QR Code. Physical handbook is significant for easier concentration and information retention while QR Code could provide students with an easy access to the handbook. This book have been sold to the students at a price of RM15.

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Furthermore, this pocket book also is equip with some infographic relevant to the context of the course. This infographic could further assist the students to better understand the Environmental Quality Index. Figure 2 displays a sample of infographic.

7.0 NOVELTY

This product of innovation uses creative graphic materials to help the students and educators facilitate their teaching and learning. Since the market only use Environmental Quality Index (EQI) by Department of Occupational Safety and Health (DOSH) and Department Of Environment (DOE) website, this pocket book will be able to create more interactive learning in class. As part of Sustainable Development Goals (SDGs), this product supports environmentally friendly by going paperless that is by using QR Code. Since the education system is now focuses on online learning due to the impact of the Covid-19, this pocket book arrives just in time to create an accessible and sustainable learning process.

8.0 AWARDS AND PUBLICATION

In the first phase, this project has obtained and won some awards in the conference and innovation competition. For example, Best Paper Awards at Regional Seminar on Youth and Communities Issues 2021. In the same year, this project also has won the Silver Award at the 3rd International Invention, Innovation, Technology (ITEC 2021). This project also have participated in the 8th International Conference on Public Policy and Social Science (ICoPS) 2021.



Figure 1. Award Obtained by the First Version of the Project

9.0 CONCLUSION

A pocket Environmental Quality Index (EQI) provide a good opportunity to its focus group. This book aims to reduce students difficulties in learning particularly on Environmental Administration subject. With huge information overload which involves tonnes of facts and data, this handbook possess a great potential to assist educators and learners in their learning process.

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