



## **AN ANALYSIS OF ENUMERATED AND FACETED LIBRARY CLASSIFICATION FOR VIABLE KNOWLEDGE ORGANISATION**

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### **ABSTRACT**

*The article primarily focused on evaluating enumerative and faceted library classification schemes in guiding librarians to have principles and guidelines involves in classification system. five topics based on environmental studies were effectively evaluated to aid in deciding classification system for special libraries, applying environmental science topics. The article presented real-world classification in tables which identifies; the main subjects, the analysis of the subjects, the topics component concept, the form of the documents, the major discipline of the topic and additional comments, it also analysed the enumerative classification scheme, such as Dewey decimal classification (the DDC) as well the DDC suggested class marks. Additionally, it specifies breakdown of the number building from major class number to more specific class mark for the documents, with critical appraisal, essentially based on faceted classification scheme Universal decimal classification (the UDC) involving the UDC suggested class marks, breakdown of the number building showing main class number, the various basic UDC auxiliaries used for classifying the documents. The article concludes by summarising the practical exercise with critical evaluation using sources from notable professional scholars in librarianship.*

**Key words:** *faceted enumerated, library classification, environmental studies, knowledge organisation.*

### **INTRODUCTION**

Librarians recognized enumerative or faceted classification as the two major classifications utilized for organising knowledge in libraries (Chan, 2005). An enumerative classification contains full set of entries concepts based on the

principle of hierarchy, The Dewey Decimal Classification DDC identifying a major class and sub class under the major class and all classes are enumerated according to common characteristics. The enumerated is normally achieved first by identifying a major class and all classes are enumerated according to certain characteristics. The enumeration is normally achieved by first identifying the main disciplines either on philosophical or pragmatic basis allocating a main class. Each class or discipline is then sub-divided into subclasses. The process of subdivision continues until the appropriate level specificity is achieved (David and Besso 2013).

Universal decimal classification on the other hand is produced to allow materials classified according to the principle of: Personality; matter; energy; space and time. Allow librarians to assign a class mark that suite identification of material based on information storage and information retrieval system, basically concerns with user warrants and literary warrants that suite information storage and retrieval system for facilitating material access (Broughton & Vanda 2004).

UDC allows flexible citation order to match local needs, it is recommended to adopt a consistent approach in order to ensure predictable filling order; when representing multi-disciplinary subjects, numbers belonging to different classes should be joined following the order in which they occur in tables i.e. by ascending order; when applying multiple auxiliary numbers, ordering follows; Main numbers/special auxiliary/common auxiliaries (Brighton; Helious; and Rongester 2005). They indicated that there is no limit to the number of special and common auxiliaries to be added for the main number among the common auxiliaries using the UDC scheme.

With conception behind the two classification scheme, this article is composed with specific objective of evaluating the two schemes; the Universal Decimal classification (UDC) and Dewey decimal classification scheme (DDC) for shaping appropriate system suitable for resources organisation in environmental science, the article aims to critically evaluate two classification schemes to aid librarians technically in understanding the basic principles and techniques involve in classifying library materials using faceted classification scheme and enumerative classification scheme by demonstrating five different topics cantered on environmental studies.

Before proceeding to evaluate the schemes, it will be necessary to understand the basic principles that guide the practicalities of using the structure of the schemes, the citation order and the challenges of classifying inter-disciplinary subjects using the schemes that are based on disciplines. These three mentioned factors can play an important role in addressing the issues surrounding the practical classification especially in using enumerative classification scheme. It will also assist librarians in building and synthesizing class numbers using multiple facet as specified in the instructions note for library classification schemes.

It is very important to take note that, the first stage in document description is determining the subject, in order to decide the broad subject area which, the document belongs. This is because classifying works accurately rely on determining the main subject, it serves as the key element for describing document content in library classification schemes.

The analysis of enumerative and faceted classification schemes in this paper article, will be done on the basis of the guiding principles below:

- Identification of the subject which will serve as the main class number. Identifying important terms considering users' needs and the best term to approach the document.
- Following the DDC guiding principle works will be classed in intended, rather than for the discipline from which the works derived.
- UDC allows flexible citation order to match the local needs, work belonging to different classes should be class in the order in which they occur.
- The concept of 'place and time' will be taken into consideration especially in the faceted classification UDC scheme, enumerative scheme DDC will stick to instructions.
- Only one decimal point will be assigned to class mark to denote the main class number which is placed after the third digit in DDC class marks signifying the major discipline overriding other concepts in the topics.

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## TOPICS PUTTING INTO TO PRACTICE

- (TOPIC 1) 2006 LEGISLATION FOR THE CONSERVATION OF CORAL REEFS IN QUEENSLAND, AUSTRALIA.

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Subject	<b>Environmental Law</b>
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Subject	<b>Component concepts.</b>
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Analysis	2006 - <b>Legislation</b> - conservation - coral reefs - Queens land - Australia.
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### **Form**

(Report)

### **Discipline**

(Environmental legislation **346.046**)

### **Additional comments**

DDC as a practical scheme group works with are used together, giving priority to work that has marginal interest to the users. e.g. “legislation” in the above given topic has a key role in the aspect of conserving “coral reefs” coral reefs on the other hand covers the concept environmental studies. Therefore, environmental law is the major term we are interested in describing this document, it will serve as main class number proceeded by any instructions from the schedule, for adding additional numbers to complete the class mark.

Classification	<b>Suggested DDC Class Mark</b>
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with DDC	346.04672 class mark)
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(DDC

### **Breakdown of number building**

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300

340 Law

346.04672 Environmental law (DDC  
class mark)

### Critical appraisals

Two major key terms have been given priority “legislation” and “environmental” aspect.

Considering user warrant, it is always important to give priority to the users when classifying, Using the informative term for the users, term that describes predominant concept in a given topic, term that provide best approach to document when searching the document by the users.

Sticking to above statements, librarians need to take note when using DDC schedule to describe content of this document will arrives at a class number “346.046” representing ‘environmental law’ interested users could search the material from legislative aspect due its marginal role in the topic.

For more specific numbers the class number “346.046” directed to add to base number following “333 in 333.7-333.9” for protection of specific resources which lead to ‘333.7’ With further instructions for interdisciplinary works on environment use “333.72” the number “72” is the number interested, going by the instructions concludes the DDC class mark with 346.04672.

Classification with UDC	Suggested UDC Class Mark
	349. 6 : 504 574 “20” (267.74)(083.94) (UDC class mark)

### **Breakdown of number building**

**3**

**34**

Law

**349.6**

Environmental law.

(Main

class number)

**504, 574**

Coral reefs conservation.

(Special

auxiliary )

**“20”**

2006.

(Common

auxiliary number of time)

**(267.74)**

Australia, Queensland.

(Common

auxiliary number of place)

(083.94)

Report

(Common

auxiliary number of form)

### **Critical appraisals**

To determine subject is the first step ‘base subject’ for example ‘treated subject’ which was identified as ‘Environmental law’. This subject represents class for approach to the material as mentioned earlier. And also in response to the question ‘what’s the document about’ next basic step librarians will follows is subject of treatment which is conservation of ‘coral reefs’ according to UDC this should be arranged in logical sequence known as ‘wall-picture’ principle of indexing. When such expression is transform into words it’s usually indicated with colon (: ) to indicate relation. E.g. the application of law for conserving coral reefs.

UDC also allows no limit to number of common auxiliaries to be added to main numbers. This allows addition of “2006” as common auxiliary of time and “Queensland with Australia” as common auxiliary of place, report represent

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common auxiliary of form all arrange together to the main class number “environmental law” and the special auxiliary number “coral reefs”.

“20” for common auxiliary of time, (267.74) for common auxiliary of place, (083.94) for common auxiliary of form as identified from UDC auxiliary tables. The UDC scheme has a wide scope that can allow accommodating all concepts in a topic without preference to a marginal aspect of topic like in the case of DDC above.

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- (TOPIC 2) COMPARISON OF DOMESTIC ENERGY CONSUMPTION BETWEEN FRANCE AND GERMANY.

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Subject	<b>Energy consumption.</b>
Subject	<b>Component concept</b>
Analysis	Domestic – <u>Energy consumption</u> – France - Germany.

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**Form**  
(REPORT)

**Discipline**  
(Energy)

**Additional comments**

The key concepts to be address are domestic energy consumption, France and Germany. We shall be looking at “energy consumption” as the base number to this document. Using the DDC adding more numbers depends on the instruction given from the schedules.

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Classification with DDC	<b>Suggested DDC Class Mark</b> 333.7932 class mark)	(DDC)
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### Breakdown of number building

300

333 Energy (Major  
class number )

333.7932 Energy consumption (DDC  
class mark)

### Critical appraisals

The subject approach to this document is “energy consumptions” looking up in the schedules we arrive at class number “333.79” representing “energy”, energy is what we are interested in. This class number has an instructions under it;

To class power resources, production of energy and electric power in ‘333.7932’

Representing distribution of electrical energy regardless of resources from which the electricity was derived.

Going by the instructions for more specific number describing ‘domestic energy consumption’ we stick to the above number. This is because there wasn’t further instruction to go about adding more specific number, electrical energy will address the concept of energy consumption.

Users who are looking for document about domestic energy consumption will surely approach the document through the subject energy consumption.

Classification with UDC **Suggested UDC class mark**  
621.317.38 (44):(430)(083.94) (UDC  
class mark)

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### Breakdown of number building



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621.317.38	Energy consumption	(main class number)
(44)	France	(common auxiliary number of place)
(430)	Germany	(common auxiliary number of place)
(083.94)	Report	(common auxiliary number of form)

### **Critical appraisals**

UDC scheme in most cases are more specific and adequate in classifying subjects. A notable example occurs in classifying the above discipline “energy consumption”, practically the search of UDC systematic tables identified class mark “612.317.38” representing “energy consumption” without ambiguity.

This explains how specific the scheme will allow class marks to represent correlating subject more specifically.

Moreover, flexibility in use of UDC scheme allows addition of multiple auxiliary numbers by using appropriate signs which could help in describing concepts in document.

For instance common auxiliary numbers (44) and (430) representing France and Germany could be added to class mark “621.317.38” energy resources with common sign of (colon) to express simple relationship between France and Germany (44) : (430), in order to have a full representation of topic and to fully demonstrate document, UDC go to the extent of describing material type talking about by addressing form of material e.g. report above with a class number (083.94) representing common auxiliary number of form.

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• (TOPIC 3) LAND USE ATLAS OF PAKISTAN.

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Subject	<b>Land use</b>
Subject	<b>Component concept</b>
Analysis	<b>Land use</b> – Atlas - Pakistan.

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**Form**

(Atlas)

**Discipline**

(land use)

**Additional comments**

Three aspect of the topic are to be address “land use” as the subject “atlas” which is a foam followed by “Pakistan” as a geographic area to be address by area table in the DDC if an instructions is given from the schedule. In the UDC scheme we can use Pakistan as a common Auxiliary of place.

Classification with DDC	<b>Suggested DDC Class Mark</b> <b><u>333.7313</u></b> (DDC class mark)
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**Breakdown of number building**

**300**

**333**

**333.7313** Land use (DDC class mark)

**Critical appraisals**

It has already been identified “land use” as the base number looking up the schedule the classifier arrived at “333.7” a notation for; Land, recreational and wilderness areas, energy. Moving on to find more specific number we arrive at “333.73” for ‘Land’ accompanied by footnotes. Interested

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notes indicated that “standard subdivision and general topics of land” additional footnotes stated that “add to base number 333.73 01- 1 from table under 333.7- 333.9. Going by the instruction we arrive at “13” adding it to the base number gave us 333.7313 as the DDC class mark.

This may provide the best approach to the users.

Classification **Suggested UDC Class Mark**

with UDC 332.22 912. (549.1) UDC  
final class mark.

**Breakdown of number building**

332.22 Land use (Main  
class number)

912 Atlas (Common  
auxiliary of form) (549.1)

Pakistan. (Common  
auxiliary of place)

**Critical appraisals**

The UDC main class number is ‘322.22’ as a result of an options to refer to “771.14” for “land use planning” in the UDC systematic table lead to class number “332.22” representing land use for the UDC class number. The class number “912” is being used from UDC common auxiliary table “1d” to refer atlas because land use has a wide coverage of land resources, water resources, agriculture, population, human settlement etc. interpreted in charts, plans inform of cartographic images and written information to describe the information. (549.1) represent Pakistan as a common auxiliary of place. Which gave us the UDC class mark **332.22 912. (549.1)**

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- (TOPIC 4) ESTIMATION MERCURY EMISSIONS FROM FOREST OF FIRES IN SOUTHERN CALIFORNIA

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Subject	<b>Pollutants.</b>
Subject	<b>Component concept</b>
Analysis	Estimation - <u>mercury</u> – emissions -forest fire-Southern California.
	<b>Form</b> (Report)
	<b>Discipline</b> Mercury
	<b>Additional comments</b> This work is going to be classify under the subject ‘pollutants’ and stick to further instructions for more specific class number. UDC will address all the concept as usual.
Classification with DDC	<b>Suggested DDC Class Mark</b> <u>344.04633</u> (DDC class mark)
	<b>Breakdown of number building</b> <u>300</u> <u>344.04</u> Miscellaneous social problems and services <u>344.046</u> Environmental protection <u>344.04633</u> Pollution (DDC class mark)
	<b>Critical appraisals</b>  The approach to this document will best be determine through the concept of pollution due to the fact that idea of mercury emission from forest fire is basically the treatment

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of environmental pollution. Users who are looking for this material will search through pollution.

Searching the term in the DDC schedule we arrive at class number “344.04” **representing miscellaneous social problems and services** searching further take us to the class number “344.046” representing **environmental protection**. For more specific numbers we arrive at “.046 33” representing \*Pollutants, searching further in order to have a full representation of the concept we arrive .046 34 accompanied with foot note to **Class pollution of specific environments by specific pollutants in “344.04633”** which finally gave us the final DDC class number.

Classification  
with UDC

**Suggested UDC Class Mark**

543.423                      551.509.68                      (739.462/.464)  
(UDC class mark)

**Breakdown of number building**

543  
543.423                      Estimation of mercury emission  
(UDC main class number)  
551.509.68                      Forest fire.  
(Special auxiliary)  
(739.462/.464)                      Southern California.  
(Common auxiliary of place)  
(083.94)                      Form  
(Common auxiliary of form )

**Critical appraisals**

UDC gives room for classifying multi-disciplinary subjects, it clearly stated that numbers belonging to different classes should be joined in ascending order in which they occur in the tables.

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The UDC alphabetical index gave the class number “543.423” representing emission analysis under the concept of analytical chemistry, basically dealing with the procedure of testing chemicals which is appropriate for mercury emissions. Also a class number “551.509.68” identified “forest fire artificial influencing weather”. This class mark apart from addressing the need of forest fire it also expresses an aspect of mercury emissions for the fact that it is artificial and have effect on the weather. This makes it to be more appropriate in addition to the class mark “739.462/.464” represent Southern California. (083.94) A class mark for common auxiliary of form.

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- (TOPIC 5) NEW RESEARCH SUGGEST THE POTENTIAL IMPACT OF FRACKING ON WATER NATURAL RESOURCES.

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Subject	<b>Water resources.</b>
Subject	<b>Component concept</b>
Analysis	Research- <b>Fracking</b> -water- natural -resources.

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**Form**  
(Research report)

**Discipline.**  
Mining.

**Additional comments**

This work is going to be classified under the discipline mining addressing the concept of mining due to the fact that fracking involves the aspect mining oil and gas resources.

Classification with DDC **Suggested DDC Class Mark**

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**333.911** (DDC  
class mark)

**Breakdown of number building**

333.91 Water.  
333.911 General topics on topic.  
333.9115 Water resources. (DDC  
class mark)

**Critical appraisals**

The task of classifying this topic will give better approach to the concept of “water resources” since the aspect of the fracking lays much emphasis on water natural resources. Users’ access to this document is to be provided on the term “water resources” searching on the base number we arrive at “333.91” representing water and land adjoining bodies “**water**” is what we interested on. Searching further for more specific class mark we arrive at “333.911” representing general topics of water

More specific search for class mark to have full representation take the classier to a foot note to add to the base number 333.911 the numbers following 1 from table under 333.7 to 333.9 which gave the number ‘5’ for full representation of the DDC final class mark. 333.9115 DDC provide access to this document through this term because it serves as the key term that provide basis for all the other concept in the topic.

Classification with UDC      **Suggested UDC Class Mark**  
622.276: 553./9 (083.94)

**Breakdown of number building**

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622.2	Mining	(Main
class number)		
622.276	Fracking	” ”
” ”		
553.3/.9	Water natural resources	(Special
auxiliary number)		
083.94	Research (	Common auxiliary number of form)

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### **Critical appraisals**

Searching for the exact term fracking in UDC scheme also proves unsuccessful considering the concept of mining as an aspect fracking and also putting users need in mind we arrive at petroleum extraction with the class mark “622.276” since fracking is basically dealing with petroleum extraction. Users could find it useful to approach the document under this category. “553.3/.9” a class number for resources is being identified as special to be added to the main number for the document description.

The class number “083.94” for common auxiliary of form is suggested from table “1 d” expressing various type of research reports, research test, and research experiment or research project. Since our work is basically dealing with research report we find appropriate for our description.

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### **SUMMARIES**

In an attempt to evaluate faceted and enumerative classification schemes to aids librarians empathetic on the basics principles underlying the classification schemes and to have better understanding of the concepts, universal decimal classification (UDC) standard edition and the full version of the Dewey decimal classification 23<sup>rd</sup> edition, in addition to sources from notable scholars like; (Vanda Broughton 2004; Eric J Hunter 2009; A C Foskett 1973; Brain Buchman 1979) were used in to ascertain a significant facts and evidence between the two



classification schemes. Contribution of this sources plays an important role in this useful exercise, in addition to online version of both the two schemes. A notable example from the UDC online version pointed out that, UDC permits wide combination of attributes of a subject and relationships between subjects to be expressed. The scheme codes from different tables can be combined to present various aspects of document content and form, for example; the UDC notation coded from topic 1 UDC suggested class mark **349. 6 504 574 “20” (267.74)** representing ‘2006 Legislation for the conservation of Coral Reefs in Queensland, Australia’. ‘**349.6**’ Environmental law (main subject), ‘**504, 574**’ coral reefs conservation (aspect of the subject) “**20**” 2006 (common auxiliary of time) and **(267.74)** Australia and Queens Land (common auxiliary of place). Complex UDC expressions can be accurately parsed into constituent elements. Even though the UDC has set of challenges, for example combination of attributes as synthesizing notation have its own challenges, synthesis mostly produce lengthy and extra symbols which may be problematic to the users “using other symbols are usually more difficult for users particularly if more than few symbols are used” (Broughton 2004 p.45). Unlike the notation in DDC enumerated classes. The evidence can be clearly seen in this practical exercise displayed in the table below.

S/No.	Items	DDC Class marks	UDC Class mark
1	2006 legislation for the conservation of coral reefs in Queens land Australia.	346.04672	349. 6 : 504 574 “20” (267.74)(083.94)
2	Comparison of Domestic energy Consumption between France and Germany.	333.7932	621.317.38 (44):(430)(083.94)
3	Land use Atlas of Pakistan.	333.7313	332.22 912. (549.1)
4	Estimation of mercury emission from forest fire.	344.04633	543.423 551.509.68 (739.462/.464)

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5	New research suggest potential impact on water natural resources.	333.9115	622.276: (083.94)	553./9
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The table above is a good illustration of lengthy combination of numbers and symbols used to denote a class mark in UDC scheme as oppose to DDC scheme. The Dewey system of classification uses numerical notation, it is one of the most distinctive features of the scheme, the use of pure notation makes DDC to be consistent and sticking to pure Arabic numerals. A serious weakness with DDC, is the fact that interdisciplinary work not absolute they are to be used only when applicable, A clear evidence indicated in this practical exercise. For example, ‘estimation of mercury emission from forest fire in southern California’ coded from topic 4, the DDC classified the documents only from ‘mercury perspective’ ignoring other aspects. The same applies to ‘2006 legislation for the conservation of coral reefs in queen’s land Australia’ as coded from topic 1, addressing the aspect of environmental law ignoring ‘biology’ ‘coral reefs’ One question that needs to be asked however, is whether the other attributes of the concept have no meaning to the users.

Perhaps one of the most serious disadvantage of DDC method is the limited scope in classifying multidisciplinary subject, the fact that complexity/multidisciplinary subject form lead the classifier to ignore some aspect which they think are not needed, given priority to the most important aspect the users will approach the documents. This is equally true especially in the subject belonging to topic 5 “New research suggest the potential impact of fracking on water natural resources”. The subject terms “*new research*” “*fracking*” are all omitted in determining the discipline, preference was given to “*water natural resources*”. An attempt to address the section that has marginal interest for the users. As further pointed out by (Buchanan 1979 p. 30) “the size and complexity of the operation lead the compiler to omit classes which they think are not needed, or simply to forget to provide them this is normally true with classes with more than one element”. Critics have also argued that not only do limited scope provide an inaccurate

measure DDC has in classifying library documents. (Hunter 2009 p. 93) Pointed out that “there can be lack of accommodation for even simple subjects”. Another drawback of the DDC is that it has a multiple set of instructions for building a class marks for example. In classifying the concepts of “comparison of domestic energy consumption between France and Germany” from topic 2. The term “energy consumptions” as the basic main subject term involves complex instructions from one class number to the other in order to add base numbers following digits of notations from table to table until the final class mark has been allocated. The complication in classifying document using the DDC scheme makes it difficult in terms of logical base order.

“The DDC has no realistic logical base but primarily governed by the nature of chosen notation, it generally recognises that the order within classes is more important than the main class order” (Hunter 2009 p. 90). Lack of logics in the schemes will makes it challenging for training the staff in the adoption of the scheme. The different is that in the enumerative scheme classes with more than one elemental component are listed readymade while with faceted scheme the classier will have to make multi element classes by synthesis. With this in mind we can comprehend how much more time consuming, complicated and tedious the construction of an enumerative scheme is, compare to UDC. UDC in this respect has the influence of keeping set of rules that are suitable to the whole system.

In UDC, the universe of information (all recorded knowledge) is treated as a coherent system, built of related parts, in contrast to a specialized classification, in which related subjects are treated as subsidiary even though in their own right they may be of major importance. Thus specialists may often be led to related information of which they would otherwise have been unaware. With regard to the above analysis and practical experience involve in the task of classifying the subjects of environmental science librarians are in a position to find out UDC faceted classification is more logical in arrangement. This goes in line with the UDC consortium which suggested that UDC has a logical arrangement and because of its logical hierarchical arrangement and analytico-synthetic nature, it is suitable for physical organization of collections as well as document browsing and searching.

As discussed earlier, different peculiarities have been considered as regards to the adoption of the universal decimal classification or the Dewey decimal classification standard edition. However, these peculiarities were given in order to obtain a clear simplicity of the scheme based on their features such as flexibility, access and accommodativeness. Hence, these approaches were given to determine the more efficient method to be adopted.

Nevertheless, this principle employed added more effort on initial training completion, in which it was observed that the consistency and logic in the universal decimal classification scheme is more relevant and convenient and does not require much instructions when compared with the enumerative Dewey decimal classification.

To conclude, with regards to the practical exercise of the two schemes in conjunction with the scholar's view, it will be appropriate to take on the universal decimal classification as the fitting classification for the five above topics of environmental studies.

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