STRATEGIC COURSE ANALYSIS AS AN INSTRUMENT FOR HIGHER EDUCATION PLANNING

THE DEVELOPMENT OF A FACETED CLASSIFICATION SYSTEM FOR THE ANALYSIS OF COURSES AND UNITS.

Abstract; While the principles underlying Strategic Course Analysis are by no means new, the discipline has become increasingly important for higher education planning in the post-Nelson era. Strategic Course analysis involves a close investigation of higher education courses as commercial products, and uses a range of instruments to assess the strength and vulnerability of courses, to estimate their marketability, the residual life of existing programs, the danger of competition, and the ultimate value of each course to the institution that provides it. The discipline is also used to indentify emerging trends in higher education courses and to predict future growth, development, and competitive strategy.

One of the major difficulties faced by the discipline is the lack of an agreed system for the encoding of higher education "products" in a manner that permits swift electronic comparison of commonalities and differences. The presenter - who is working on improvements to the instruments used to assess courses as part of his PhD at UTS - found that none of the existing systems of course or unit classification were adequate for this purpose, and has developed an analytico-synthetic 25 digit code that he believes can be applied universally across all disciplines and levels, and to all course components that are found in Australian higher education.

The code was developed with the intention that it should have the simplest possible rules; be applicable to all higher education products irrespective of their nature; be suitable for non-award, short and contract courses as well as the traditional programs of universities; and that the information encoded should be easily retrievable by the most basic software or at last resort by visual inspection.

The classification is based on the methodology originally developed for library purposes by S. R. Ranganathan, and subsequently improved by Henry Evelyn Bliss and (some years after his time) by the UK Classification Research Group, but goes beyond the recomendations of this body to enable the current *Australian Standard Classification of Education (ASCED)* (2001) and the recently developed *Carnegie Higher Education Classifications* (2005) to be incorporated into the system as self contained blocks.

The presenter explains the problems overcome in the development of this system, and demonstrates its practical use in the strategic analysis of courses and units.

Biographic Information; Dick Audley is a mature age research student at the University of Technology, Sydney where he is seeking to improve the instruments used for strategic course analysis, a discipline in which he has been working for much of his professional career. After retiring from the University of Western Sydney in 2003 he accepted an invitation to continue his work with course analysis as a Senior Policy Officer with the NSW Directorate of Higher Education.

Full Paper

This paper is in three parts. I am going to commence by giving a brief explanation on the rapidly emerging discipline of Strategic Course Analysis and the role that this discipline has started to play in the management of Australian higher education following the Nelson reforms. I will then going to say a few words about my own involvement with this discipline, and the nature of my research at UTS.

Most of this is background, however. The most important thing that I would like to share with you is the development of a faceted classification system for the analysis of higher education "products" (and this includes everything from the smallest modules to complete courses) which has been developed to enable rapid identification of the commonalities and differences between units, majors, and courses across the whole of Australian higher education.

While initial trials have been most successful - and I think that our small team has probably moved further than most in establishing a practical method for the comparison of courses and units that really works - it remains a "work in progress", and I would appreciate your comments and input.

Strategic Course Analysis as an academic discipline

There is little completely new about Strategic Course Analysis, except perhaps the name of the discipline and its recent discovery by academia. I know that a number of you have been practicing this discipline under other names (or perhaps as something one did without even bothering to give it a name) in your own institutions for many years, and I can only hope that I am not going over ground that is too familiar in explaining the background to this "black art" and showing how it can be used by the modern university.

Perhaps the most concise description of Strategic Course Analysis is the one that I gave at the recent ATEM National Conference in Perth:

> ***Strategic Course Analysis is the critical examination of higher education courses to take advantage of their strengths and weaknesses***

In the past the detailed examination of higher education courses - both of one's own institution and those of one's neighbours - tended to be something that was confined to a small band of enthusiasts who did it more as a sideline to their normal work. If they noticed a strategic gap or a marketing opportunity they brought it to the notice of their superiors, but it tended to be done in a fairly ad hoc way more as a hobby than as a formal study.

This has changed quite dramatically with the introduction of the Nelson reforms. Much of the old security has gone, the sector has been forced to become competitive, and there are far more players seeking to attract students from a rapidly declining pool of applicants as private and specialised institutions enter a market that was previously a monopoly of the public universities. Worse than that, institutional resources are shrinking across the sector, and it is essential that those funds that are still available be used in the most effective manner. Universities - like punters who are having a bad day at the racetrack - can no longer afford to back outsiders in the hope that some will come home. Bets must be on proven stayers even if the odds are quite short. In the same way higher education institutions have been forced to become "canny" in their investments to ensure that they get the best return, and this includes the investment made on courses as well as the cash spent on more material projects.

Thus a discipline that was previously the amusement of a few eccentrics has suddenly become a major industry. Institutions must know what is actually in their courses, how much it will cost them in terms of income and expenditure, and whether the investment is worthwhile. They must also know how their courses are likely change over time in the light of industry and stakeholder demand, and the potential impact of change in the economy and in government policy. Even more they must be aware of what competitors are doing, and what they are likely to be offering in the future.

There is a downside to this as well. As storms approach a number of sea-captains increase their freeboard by dumping their least valued cargo, and in a university context this means the consolidation of courses and the retrenchment of staff. An increasing proportion of universities have been forced to reduce the number of courses and units on offer and the number of staff on their books, and the discipline of Strategic Course Analysis - through its role in determining which parts of an institution's profile are viable and what are not - has, perhaps unfairly, taken much of the blame for what has happened.

The end result is that Strategic Course Analysis - while now practiced in some form by almost all Australian universities - tends to be conducted behind closed doors as some sort of "mystic art" that remains well hidden from academics and the rest of the university community. This is unfortunate, as the discipline has matured strongly over the past few years, and its methods have become a legitimate and robust academic study - even though it remains a "persona non gratia" with individual academics, and is generally unknown outside the closed circle of its practitioners and their supervisors.

I have no wish to speak at great length about the use of Strategic Course Analysis this afternoon, although I will say a few words about my research in this area, mainly because this leads on to my main topic - the development of a faceted classification for the analysis of courses.

I am a postgraduate student at UTS where I am engaged in improving the instruments used for the analysis of courses. I am particularly interested in developing the instruments used to assess the vulnerability of courses and their potential life cycle, mainly so that wise decisions can be made at the point of accreditation about whether one should allow un-seaworthy vessels out of the shipyard. My research has attracted considerable interest, and there may be some strong commercial as well as academic possibilities.

The Development of a Faceted Classification for the Analysis of Higher Education Products

One of the tasks that was commenced earlier this year involved the development of a system for the faceted classification of university "products" (modules, units, majors, strands, and so on, as well as complete programs and courses). As explained previously, the practice of Strategic Course Analysis requires a close comparison of the "products" of different institutions, and it is often necessary to ask how a particular course (let's say, the MBA offered by QUT) differs from something else (let's say, the MBA offered by Edith Cowan University) or from MBA's generally across the sector. It could be that one does not need to know every difference between these programs, but simply one significant feature (the particular "facet" in which one is interested) such as how does the assessment practice in the MBA at QUT differ from the assessment practice in the MBA at Edith Cowan, or from MBA's generally across Australian higher education?

One could do this (if one had unlimited time and patience) through examining the course documentation for each program individually, but this would be very slow, particularly if it was necessary to examine the documentation for every MBA offered across the country by both the pubic and the private sector before one could form an opinion. The task would become impossible if one was to spread the question even wider to include a number of variables, such as "Which Postgraduate Business awards across Australia other than MBA's operate on a three session year, are assessed by continuous assessment, and are available only by external

study?", particularly as the answer to questions such as this is often required by someone on the phone who expects an immediate answer.

What was needed was a system for the retrieving of data electronically so that one could avoid the need to plough through course documents and could give a reliable answer quickly. This in turn required a system for the encoding of the "features" of all manner of university products across all disciplines and at all levels.

As far as we were aware (there were a number of people who supported this task, although I was the principal researcher) nothing of this nature had been previously attempted for Australian higher education, although there were a number of systems for the encoding of specific commonalities such as the discipline area or the detailed field of study. We needed to go well beyond this, and as nothing else was satisfactory we were forced - as so often happens in Strategic Course Analysis - to develop our own system.

First though, we developed a basic specification;

- The encoding had to be as simple as possible. The system needed to be something that could be learnt in a few minutes, would allow data entered with a minimum of training, and would enable data to be retrieved as rapidly as possible using the most basic off the shelf software. The emphasis throughout would be on simplicity - any system adopted would have to be too simple for someone to accidentally make a mess of it.

- The system had to cover all higher education "products" from modules (as smaller components of units or subjects), to units, majors , strands, specialisations, courses, and even families or portfolios of courses.

- The system had to cover all levels of course from VET to higher doctorate, and had to be able to distinguish clearly between these levels.

- The system had to apply to all types of higher education institution, from the smallest private institution to the largest university or consortia of universities

- The system had to cover as many "facets" as possible, and should be able to search and retrieve each of these facets independently.

- The system had to allow the coding of previously uncodeable items, such as course and unit objectives and course and unit content as well as more obvious features, such as the duration, mode of delivery, and assessment methods. [As far as we could determine this had never been done successfully by anyone else, but we considered this information vital for course and unit comparison purposes, so we had to address it]

- The system had to cover non-traditional products, such as short courses, non-award courses, bridging and preparation programs, and courses taught under contract to employers, as well as the more traditional forms of higher education award.

- The system had to be capable of expansion to cater for new types of award, new levels, or new modes of delivery, that do not exist - and indeed are not foreseeable - at the moment.

- The system had to address difficulties that had arisen with previous forms of course classification, such as the different types of postgraduate award (a point that the *Australian Qualifications Framework - AQF* is rather weak on) and emerging awards, such as Scholar and Licentiate, as well as Associate Degrees in their various forms.

- The system had to have provision for the person doing the coding to indicate how confident they were about what they had entered. Thus if the person was not really confident about the information they had coded, this could be taken into account, and if need be the data rechecked.

- The system had to be fully integrated with the existing methods of course and unit description used in Australia, such as the Australian Bureau of Statistics *Standard Classification of Education* (ASCED) 200, and the recently developed *Carnegie Higher Education Classifications* (2005). It also had to link with the standard international methods of course classification, such as the *UNESCO International Standard Classification of Education* (1976), the Organisation for Economic Co-operation and Development (OECD) *Classifying Educational Programmes: Manual for ISCED-97 (*1997) and the classification systems used by the major international Business accreditation agencies in Australia, such as EQUIS and AASCB.

- Above all, it had to be as simple as possible. [And as cheap as possible to develop!] If it involved an explanation of more than a few minutes (or a few lines when it came to writing the manual) it was too complicated, and had to be made simpler.

This was a demanding specification, although I believe that we have achieved it, but I leave it to you to make the final judgment.

The first task was to examine existing methods of classification to see if we could any of these as a jumping off point. There are few methods of classification that are used in higher education, but after discussions with a friendly librarian, it was suggested that the methods used by libraries to classify their holdings might be worth examining. This was followed up, and was ultimately the pathway to success, but both of the common methods used by academic libraries in Australia (the Dewey Decimal System and the Library of Congress Classification) proved unworkable. We then explored numerous other methods of library classification, becoming familiar with names and systems such as those of Cutter, Savage, Sayers, Palmer, and numerous others that have since been confined to the archives of Library Science, before becoming familiar with the *Bibliographic Classification System* originally described by H.E.Bliss (1929, 1939, and 1953) and the *Colon Classification System* developed by the noted Indian librarian Shiyali Ramamrita Ranganathan (1933, 1937, and 1944). These were far closer to our requirements, and we ended up being highly dependent on the methods of the Colon Classification System for our theoretic framework.

The system developed was then moved beyond the theoretic into the practical and harsh world of higher education.

We started by looking for the simplest method of encoding and data retrieval. After a few false starts we developed a spread sheet with 25 columns, each of which was headed by a letter of the alphabet. [We eliminated the letter "I" at an early stage, nominally to avoid confusion with the figure "1", but also to give us a spare column in case we had overlooked something.]

We then allocated columns as follows;

Columns A to F. These six columns contain the six digit ASCED "Detailed Field of Studies" code. We left this code exactly as it is, including a use of zero that was inconsistent with the other rules we had developed (in our general rules zero means "I don't know" or "There is insufficient information to make a judgment") but we felt it best not to change the ASCED code. We did find that the published ASCED code was insufficient to give us the precision we needed, however, particularly when it came to disciplines such as Theology and Mathematics. We therefore added a number of codes that follow the model of ASCED, but are not part of the official structure, and these are shown in our manual in italics. We believe that it will be necessary to add considerably to these codes as we attempt to cover the whole curriculum.

Column G This column describes the nature of the "object" we are examining. We wanted the code to cover all "university products" from modules (as smaller components of units) and short courses through units themselves, to majors, strands, and so on, up to courses. We had only eight digits at our disposal (as mentioned previously zero means "I don't know" while 9 means "not included in any of the above" and we tried to make the best use of these for differentiation purposes. There is nothing particularly controversial about this column, although we have drawn a distinction between short courses of less than a week in duration and other non-award courses greater than a week.

Column H This column is used to show the level of the "object" under examination, and ranges from "below Associate Degree" to "Research Doctorate". There are a number of important distinctions made in the column, the most controversial being the splitting of postgraduate coursework programs into two categories, postgraduate in time but not in level, and Master by Coursework. It was felt important to distinguish these groups, and while they fall within the one AQF level there is a considerable difference between the awards. The distinction between a Doctor's degree by coursework, and a Doctor by research (which included\s Masters Research degrees as well) is perhaps less controversial.

Column J This column indicates the "purpose" of the object. [In other words "Why is the object (course, unit, etc) being taught?"] This column breaks new ground by seeking to distinguish between units and courses in non-award programs where records are kept, and those where they are not. This is becoming an important distinction in an age of RPL (Recognition of Prior Learning) where short courses may well become a backdoor to a formal award. The other important concept is that of an "Application Form Award" which is used to differentiate programs from Exit Points Only. [An "Application Form Award", as the name suggests, is an award that is printed on the application form, and which can be entered by a student at the first instance, even though the majority of students may not choose this option. An Exit Point is something that does not appear on the original application. Graduate Certificates and Graduate Diplomas can fall into either category]. The Column also includes Staff Development and/or Contract Courses as a separate category, and reflects the growing importance of courses of this type across the sector.

Column K This reflects the duration of the "object" in time, and allows for both a three session and a four session year, as well as the traditional two semester model. The Column also allows for activities of very short duration (such as one day short courses) and for programs (including combined degrees) that extend for more than three years.

Column L This Column deals with the mode of delivery/mode of attendance depending on whether we are dealing with a unit or with something else (such as a course) [Column H tells us whether the object is a unit or not] This has been done to try to squeeze the greatest amount of information from eight digits. Mode of delivery applies to units only. Mode of attendance (full time, part time, etc) applies to everything other than a unit.

We have tried to avoid the issue of Flexible Delivery in this context, mainly because the term can mean so many things, depending on the institution. The approach taken is that if the unit is available in traditional mode on campus we code it as this, even though some students may choose to take it in a different manner. Any other solution would open the flood gates to confusion. We have also tried to distinguish between units delivered at a distance in real time (ie; using some form of electronics that allow immediate communication between staff member and student) and distance programs delivered by computer, but where there is no direct interaction between teacher and learner. The column also includes other modes of delivery such as intensive mode, unstructured mode (found in many community courses) and fieldwork, clinical placement, or industrial experience.

In regard to "objects" that are not units, we have tried to cover all modes of attendance, and this includes things that are over and above the traditional F/T, P/T or External. One point that may be of interest is our attempt to distinguish between courses offered off shore that require no physical attendance in Australia whatsoever (for which, or course, no visa is required) and those offered off shore that require students to attend Australia for some period (even though the period itself may be quite short). We are aware that there are a number of programs that do not fit neatly into the categories provided (sandwich courses, transfer programs, and exchange visits) and we have advised that these be included in Category "9" in this column.

Column M This is another column with a split classification, relating to mode of assessment in the case of units, and to the anticipated vocational or professional outcome with "objects" that are not units. We have tried to cover all of the usual forms of assessment in the case of units, and most of the potential anticipated outcomes.

Column N This is the first of the columns that deals with objectives, and I am the first to admit that this section (and the one following that deals with Content - Columns Q to U) gave us the greatest difficulty. We realized at a very early stage that it would be impossible to list all possible objectives, and that the most that we could do would be to describe the general nature of the objectives in each case so that commonalities could be identified. Once these commonalities were known it would be possible to examine the hard copy course documentation for more specific information.

In Column N we describe the focus of the objectives. (Essentially this means the "purpose" of the objectives - or what the objectives were trying to achieve - but as this term had already been used in a different context in Column J it was felt that it would be unwise to include it a second time)

There is nothing particularly controversial in this section, but as we are conscious that we are breaking new ground in trying to code these things, any feedback that could be provided would be most appreciated.

Column O In this column we assume that the objective adds value, and we ask "To whom or what is this value added?". There is little that is controversial in the categories used, but again because we are breaking new ground we would appreciate your feedback.

Column P This column asks "How does the objective add value?". (In other words we have determined in Column O to whom or what it adds value, now we are asking "How does it add value?". Again, there is not a lot that is controversial, but any feedback that could be provided would be appreciated.

Columns Q to U deal with the content. As mentioned above, we had enormous difficulty with this, as it is not possible to list specific content (and certainly not in eight fields!) and the most that can be done is to describe the nature of the content so that a comparison can be made.

Column Q This column examines the "theme" of the content. What we are talking about in this case is something similar to a musical theme which sets apart families of tunes, even though they are not the same piece of music. We have tried to make this as simple as possible by suggesting a question to be asked, and in this case the question is "What is actually being presented to students?. We have then given a range of responses.

The developers of this classification are only too well aware of the thinness of the ice on which we are skating as we try to reduce a deeply philosophical concept to a numeric code in this column and in the four columns that follow, and we would appreciate your advice.

Column R This column deals with the method of justification. In other words, "What justification is given for the content being taught?". We have given a number of possibilities, and we believe that these give a reasonable coverage of the field, but again we would appreciate your advice.

Column S This column deals with Depth and Breadth. In other words "Is the content taught in depth, so that there is a tight but intense focus on specific issues, or is it being taught in breadth, with more ground being covered, but more superficially than it might have been?". Again, we would appreciate your comments and advice.

Column T This column deals with the "range" of the content. In other words "Just how many items does the content cover?". As explained in the Manual, the range can be narrow or extremely wide. It could focus on a single topic, or it could cover a multiplicity of topics, and it may do either in depth or in breadth.

Column U This column covers the "period" of the content. As explained in the Manual, "period" indicates the currency of the content. It could be something that is old and hallowed by tradition and yet still valid (such as good old Newtonian Calculus) or it may be something that is brand new, and has just appeared in the journals - or it could be anything in between.

We do not regard Columns Q to U as by any means final (although we do insist that they be used to describe the content, and not for some other purpose). We have been conscious that we have been walking within the unknown in developing these scales, and any assistance or advice that could be provided would be appreciated.

The remainder of the table is far less complicated

Column V is the year on which the information is based. Hopefully all university products are updated at regular intervals, and the information that pertains in 2005 may not be the information applicable in 2006. This column simply gives the opportunity to record the year on which the information is based.

Columns W to Y relate to the institution, and we have used a multi column classification to enable us to identify institutions by state, by type, and ultimately by name. We have also tried to ensure that adequate coverage can be given of the private providers (particularly as a number of these are starting to become the leading areas of innovation) as well as the public universities.

Column Z is a most important column, and here perhaps we depart from the norm, in that this is the column in which the person doing the analysis indicates their confidence in the entry they have made. We have made this provision for three reasons. The first is that the information on which one can make a judgment varies enormously. One may have the full course documentation, or on the other hand, one may have nothing more than an extremely brief outline. If there is not a lot of information there will obviously be uncertainty about the accuracy of what has been entered. As more information becomes available items with a low confidence level can be updated.

The second point is that it may be necessary to use inexperienced and poorly trained people to do some of the analysis. We assume that they will do the best job they can, but it is unreasonable to expect a newcomer to code confidently in the abstract areas of Columns R, S, and T. At the same time we don't want them entering zero, and saying in effect "We don't know!". What we would prefer them to do is to have a go, and to learn by making the effort. At the same time we don't want invalid answers clogging the system and possibly going undetected. Thus we have indicated that there is no shame in admitting that one is uncertain and giving oneself a low confidence rating. This ensures that if the information in the entry is critical for some purpose, we can examine it again, and possibly update it. There has to be honesty, however, and if the person is not confident of their answer they must be prepared to mark their entry accordingly.

The third reason is possibly even more basic. There is no finality in this system of classification. Courses will change, units will change, and the coding will be different as we examine objects in the light of experience. We are seeking to encourage this sense of impermanence through insisting that the last entry be a confidence level.

There is not much to say about the rest of the project. Field tests have commenced, and while the coding seems to be taking far longer than expected, it appears to be working. There is a Manual that explains the code, and this will be distributed at the presentation. The software is extremely basic, and consists simply of a selection algorithm, along the lines of "List all rows where G = 4, J = 5, and K = 1" and so on. Indeed once the encoding is done I think that it would be possible to run the electronics quite safely on my old Apple 2e, although memory and speed might be a problem.

Eventually we hope to have a system that will enable a rapid comparison of higher education "objects" of all types, irrespective of the level, nature, or provider, and that may become a standard for course and unit analysis practice across the industry.

Conclusion

Strategic Course Analysis has already become an important instrument of higher education planning. It is a field that is rapidly developing its standing as a legitimate academic activity, and I think that we will hear a great deal more about it in the future.

There is no copyright or other restriction on the instruments that are being developed for the analysis of courses. You are more than welcome to make use of the Faceted system that I have described today in your own institution, or as a tool to assess the strengths and weaknesses of your rivals. The more people who make use of these systems, the better our understanding, and hopefully the faster we will get rid of potential problems.

I would appreciate your comments and feedback.

Acknowledgements

While I suppose that I have been the driving force (and certainly the great nuisance) behind this project it would have been impossible to have entered the mysterious world of library classification without the whole hearted support and enthusiasm of the staff in the UTS library, many of whom went out of their way to explain to a non-librarian just how the major library classifications systems work in practice (which sometimes seem to be quite different from what is explained in the text books). I also appreciate the input of my work colleagues who have provided both searching questions and considerable technical assistance.

Bibliography

As explained above, much of the theoretic framework for this classification has been drawn from the world of Library Science, and has been transferred to higher education. There would appear to be few works dealing with the classification of higher education products on this scale or to this depth, at least on the Australian scene, although we would be happy to be corrected.

Australian bureau of Statistics (ABS) (2001) *Australian Standard Classification of Education (ASCED)* ABS Canberra ACT

Bakewell, K. G. B., (ed) (1968) *Classification for Information Retrienval* Bingley: London

Batley, Sue.,(2005) *Classification in Theory and Practice* Chandos Publishing: Oxford

Batty, C.D., (1966) *Introduction to Colon Classification* Bringley: London

Bliss, Henry Evelyn (1939) *The organisation of Knowledge in Libraries* 2nd Ed

Booker, G.C. & Star, S.L., (2000) *Sorting Things Out: Classification and its Consequences* MIT Press; Cambtidge MA

Broughton, Vanda., (2004) *Essential Classification* Facet Publishing: London

Hunter, E. J., (2002) *Classification Made Simple* 2nd Ed Ashgate: Aldershot UK

Maltby, Arthur., (1975) *Sayers Manual of Classification for Librarians* 4th Ed Andre Deutsch: London

Mills, J., & Broughton, V., (1977) *Bliss Bibliographic Classification: Introduction and Auxiliary Schedules* 2nd Ed Butterworths: London

Organisation for Economic Co-operation and Development (OECD) (1999) *Classifying Educational Programs: Manual for ISCED-97 Implementation in OECD Countries* OECD: Paris

Ranganathan, Shiyali Ramamrita (1937) *Prolegomena to Library Classification* Madras Library Association: Madras

Ranganathan, Shiyali Ramamrita (1939) *Elements of Library Classification*

Ranganathan, Shiyali Ramamrita (1944) *Library Classification; Fundamentals and Procedure*

Ranganathan, Shiyali Ramamrita (1953) *Philosophy of Library Classification*

Ranganathan, Shiyali Ramamrita (1960) *Colon Classification* 6th Ed Asia Publishing House: Bombay

Rosenfeld, L., and Morville, P., (2002) *Information Architecture for the World Wide Web* 2nd Ed, O'Reilly Publishing ; Sebastopol CA

Scriven, Michael.,(2001) *Evaluation Thesaurus* 4th Ed SAFE Publications: Newbury Park CA

Stake, Robert E (1967) *Towards a Technology for the Evaluation of Educational Programs* Rand McNally: Chicago

United Nations Educational, Scientific and Cultural Organisation (UNESCO) (1997) *International Standard Classification of Education: ISCED 1997* UNESCO: Paris

Vickery, B. C., (1960) *Faceted Classification: A Guide to the Construction and Use of Special Schemes* Aslib: London