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EDITORIAL COMMITTEE

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Message from the President

As the first and founding president of Pakistan Association for Research in Education (PARE) one of my commitments to the strong and growing membership of PARE was the publication of *PARE Research Bulletin.* For *PARE* to be able to foster educational research it is essential that we also provide a venue for members to disseminate their findings, raise their voice on theoretical and philosophical issues pertinent and relevant to Pakistan and leave their academic and scholarly footprints for the future. I am very pleased to see that my efforts have borne fruit and this commitment has been fulfilled. You have the first copy of the *PARE Research Bulletin* in your hands.

At a number of PARE forums I have spoken of the need to support both "research in education" and the "researcher in education". Research in education has been called the "hardest science of all" due to the multiplicity of context even in a single educational setting and the innumerable interactions at different levels that teaching requires. The researcher in education has not only to deal with these challenges but also cope with less than optimal training in research and lack of institutional support for it. The inauguration of the *PARE Research Bulletin* is a welcome addition to the steps that PARE is undertaking to support and promote a vibrant research culture in Pakistan.

It is hoped that this *Bulletin* will be a harbinger to a full-fledged research journal. At this point we have chosen to start small and publish a yearly issue of the *Bulletin* on a regular basis. Once regularity and quality is maintained over a period of time we will expand its publication schedule to more than once a year. However at the outset a clear, systematic and transparent peer-review process has been initiated that will ensure quality now and in the future.

This publication would not have been possible if it was not for the efforts of the Editorial Committee and the Editors of the *Bulletin.* I want to thank Dr Anjum Halai for taking a lead in this matter and offering strong scholarly leadership to set processes that will continue to benefit the *Bulletin* in the future. I also want to thank Syed Naeem Ahmed for his enthusiasm and energy that made it possible for us to move very quickly to achieve this goal. The Executive Council has been strongly supportive of my efforts to initiate the publication of the *Bulletin* and I want to thank them for their cooperation and support.

Nelofer Halai

PARE President

December 2009

From the Editors' Desk

It is with immense pleasure and a sense of pride that we present the first issue of the PARE Research Bulletin. The bulletin seeks to present high quality work on significant issues in education. In doing so we recognise that education is a multidimensional and complex field, so that a variety of theoretical perspectives, methodologies and methods are needed to understand and improve education policy and practice. Hence, the PARE Research Bulletin takes a broad and inclusive view of educational research. Alongside inquiry into significant issues of relevance to policy and practice, we also encourage contributors to raise theoretical and philosophical questions about the nature, purpose and quality of educational research in the context of technologically less advanced countries like Pakistan.

The response to the call for papers was very positive. We received a number of submissions from a range of institutions across Pakistan. These papers were reviewed according to a set criterion and selected on the basis of merit.

Many people and institutions have played an important role in bringing this bulletin to your desk. While it is not possible to acknowledge all some merit a special mention. Aga Khan University Institute for Educational Development provided unwavering support in a variety of ways to enable the bulletin to move from an idea to a reality. Campaign for Quality Education has been a steady friend of PARE and sponsored the publication of this issue.

We hope that this first issue is a precursor to a publication which will develop a reputation for leading and presenting rigorous research on issues in education.

Editors

Anjum Halai

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Technology-independent, High-stakes Tests

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Abstract: *The primary goal of public sector institutions of higher education is to provide the opportunities for the talented and deserving youth of the country. However, with the ever-increasing population growth rate and the corresponding increase in the number of students seeking admission in state-run institutions, especially those offering professional programmes, the need has arisen for selection procedures to be streamlined. Consequently, high-stakes tests are being conducted for gate-keeping purposes (McNamara, 2000) especially for undergraduate programmes. Technology is not commonly used in the public sector institutions in Pakistan to conduct the high-stakes admission tests, since valuable and scarce resources are earmarked for the academic programmes and processes.*

Introduction

Globalisation has created its ripple effect in most countries, especially in regions that fall under Kachru's (1995) 'expanding circle'. Therefore, for employment opportunities, empowerment and socio-economic growth, working towards a degree, specially a professional one, for employment and socioeconomic uplift of individual families is a high priority for young people in many South Asian communities including Pakistan. The motives of young people for getting higher qualifications are instrumental rather than integrative. Most of them are not at all interested in self-development, or knowledge acquisition, or in enhancing their soft skills. Endeavours towards getting higher qualification and therefore better jobs are usually present in most cases, even when the socio-economic background of the family is fairly stringent. In such a situation where, regardless of family's economic status, more and more applicants seek entry into professional degree programmes there is a dire need for the applicants to undergo the stress of high-stakes tests, e.g. Admission / Entry (and similar nomenclatures).

This paper aims at presenting a case from a public sector university where the high-stakes tests meet the necessary criteria of validity and reliability without using technology (OMR). The Entry Test has been conducted without technological support and even the concerned authorities being consciously aware of the Thinking Skills Test (Cambridge Tests). Nonetheless it has been found that the Entry Test (ET) meets the necessary criteria of validity and reliability through its conceptual design and administration. According to Coombe (2009), citing Shohamy, Donista-Schmidt & Ferman (1996), Loschert (2000), Wall (1997), Weir (2005), high stakes (and low stakes) tests have washback effect, the degree of which varies over time in accordance with the status of the test, the language assessment, the purpose of the test, the format of the test, and the skills assessment. Coombe (2005) adds that more recently such tests have been used in various contexts to measure, monitor, and improve the quality of teachers and students.

Background of study

Access to higher education in public sector institutions has had to be 'controlled' in view of limited resources. The introduction of Entrance / Entry Tests was subsequent to Pakistan becoming a signatory of the Jomtein conference and Education for All Initiatives (1995). In 1998 the Federal Education Minister announced that all public sector professional / specialist universities would be introducing entry tests for undergraduate programmes. The directive sent out to all public sector institutions by their respective chancellors (provincial governors) to conduct entry tests was accepted perforce with certain provisos as in the case under discussion here (DAWN, Dec 5, 2005; October 01, 2006).

Higher education in Pakistan has received a great deal of attention in the past half decade and efforts have been made to plug the gaps through a number of landmark initiatives including ELT Reforms Project. As per government policy, the medium of instruction is English, especially for science and commerce education from secondary to postgraduate level, as well as, for research activities. An important gap relates to the teaching and learning of English, adequacy and availability of EAP materials, and teachers' preparedness to deliver such courses. Studies (published and unpublished) have stated that the language policy issue in higher education in Pakistan has not been adequately addressed by the various education commissions set up by the government. High-stakes tests under various nomenclatures are now fairly commonly used in Pakistani higher education institutions for nearly one and a half decades. The official decision to hold Entrance /Entry Tests for admission into public sector institutions (113 public and private sector universities across the country) offering professional programmes was taken in 1998 by the governor of Sindh by a decree.

Rationale for Entry test

Until the mid 1990s premier institutions, specially those offering professional programmes, were employing one particular Business School in Karachi set-up with the support of Wharton Business School more than four decades ago, to conduct admission tests. But the institution under discussion did not do so for ideological reasons. However, in 1996 the Chancellor of public sector universities in the province of Sindh decreed that an entrance test was to be administered by all public institutions of higher education especially for professional undergraduate programmes. There was a mixed response to this initiative, but the University under discussion here decided to use the Entry Test for sifting purposes only, and thus circumvent corrupt practices, such as manipulation of test scores and interviews scores, as well as, unfair enrolment of nominees on political and other grounds. Hence, the University agreed to conduct the Entry Test (ET) independently, and to grant admission to only those applicants who had been sifted through the ET. The decision was based on the following reasons:

a. Like other public sector universities in the country, this University too has its tried –and–tested admission criteria that include reserved seats (under their own merit) as well as on self-finance basis for children/wards of teachers and employees and servicemen (See Appendix A about admission criteria attached here). Therefore, the statutory bodies arrived at the decision to (i) give no weightage to the Entry Test in order to keep the relative merit unchanged for the students who have been examined

by any Board using the same curriculum content and similar Exam papers. Thus, the ET was planned to be used for weeding out students with false/pretentious qualifications, as well as check the level of real knowledge and skills in English, Math, Physics and Chemistry that was tested in the Board examinations a couple of months prior to the Entry Tests. (ii) The Entry Test (ET) items -- 100 MCQs -- would carry equal weight. There was a debate about adding value to the sections (each comprising 25 items and 25 marks) on English and Math, although all subjects are equally important, as the children / wards of employees and others could be at a disadvantage (See selections from sample paper attached here as Appendix B). Some Boards were presenting inflated results and their students' individual transcripts did not reflect their real performance;

b. Students from Karachi Board were generally academically sounder than their counterparts from other Boards in the province;
c. Students who secure A grades are by and large worthy of the marks they secure in the sciences and math if not in English; and
d. Even if applicants attended coaching classes before appearing for the ET, they were sure to have learnt something additional.

Test Design and Implementation

The Chairperson in charge of Admissions (past) devised the format of the test and the system has been further refined by his successor. In an unpublished Annual Report (to the Senate) the Vice Chancellor wrote, "I indicated my willingness to introduce the Entry Test only if the N.E.D. University were allowed to design and organise it without any outside interference... (and) not to assign any weightage to the test and to let each candidate take one copy of his answers home -- factors which ensured complete transparency and literally eliminated all adverse criticism." The decision was made that test items were to be designed to re-confirm students' knowledge and skills at the pre-university Board examinations (Higher Secondary certificate). Only a few fulltime faculty members, known to be very dedicated to their teaching at the University only, were invited to prepare 200 test items for each of the four subjects, namely, English, Math, Physics, and Chemistry. Thus the initial Test Bank comprised 800 items in all from which a select committee shortlisted the items to be included in the test booklet (this has been the practice since that date; however, items are being added to the Test Bank on an annual basis).

There is a test booklet (somewhat similar to that for TOEFL/IELTS, etc) containing the question items and a carbonised answer sheet wherein the carbon sheet belongs to the candidate. Overhead transparencies are prepared as answer keys which fit as overhead projector transparency overlays over the candidates' answer sheet exactly for marking convenience. University faculty members selected and trained to mark the answer papers also invigilate the Entry Test which is conducted in blocks of 25 students each. The number of applicants has ranged from 2200-2700 for (initially 932 seats to) the current number of 1587 seats. Every candidate has to write his/her name on the answer sheet and test booklet (which contains blank sheet for rough work). A hard copy of the answer key is handed to each candidate as they leave after completion of the Test; the answer key

is also available on the University's website. Additionally, a hardcopy is posted on the notice-boards placed on the fence facing the main road and all gates are locked.

Issues of test validity and reliability

It is generally and universally agreed that tests (especially high-stakes) have to meet certain reliability and validity criteria for them to be valued and accepted. Test validity (content and construct) is maintained in terms of (i) test design and the main objectives stated in the prospectus, and (ii) the sample paper provided to candidates. The items in all the section match those in the pre-University Higher Secondary Certificate examination papers. The items in the English section of ET are as follows:

- Sentence completion (lexical and structural items)
- Use of homonyms /antonyms
- Error detection (use of structures)
- Identifying correct summaries of passages* (The passages are a mix of known and unfamiliar texts

The other items are similar in content to that in the Higher Secondary Exam paper)

The items for Math, Physics and Chemistry cover the entire curriculum of Higher Secondary Certificate (HSC), and the MCQs are designed to encourage Thinking Skills to a limited extent.

Test administration and reliability factors

The reliability of the Entry Test in this case can be judged on three parameters. The first one relates to inter-rater reliability which is established by arranging for two raters to mark each set of 25 answer sheets belonging to a block. Each row comprising ten blocks (each block with 25 candidates) is supervised by one head invigilator who is the head of a teaching department, and each block has two invigilators. After the ET is over, the invigilators as raters are re-assigned blocks (pre-determined by the Admissions Committee), and the Head Invigilators (Heads of departments) distribute among each pair of raters an answer key, a rating sheet and a set of 25 answer scripts. After the raters finish marking and comparing scores for accuracy, the documents are received by the Head Invigilators and duly entered in their logs before the raters are permitted to leave the Examination canopy. All this takes approximately 90 minutes. After the raters leave the canopy, the test grading sheets are re-examined to ensure that no errors are made overall. By late afternoon all the results are posted on the website for candidates to check the results personally and prepare for the interview call. The second reliability factor is that a little more than 75 % of the total number of seats available on Open Merit (Regular) and Self-Finance scheme are filled by deserving candidates who are Karachi-based and have very high A grades (75 % and above) in the Higher Secondary Certificate Examination of the Karachi Board. The data for this study was obtained from the Admissions Committee and is considered to be factually reliable. The third parameter related to reliability was addressed through the administration of a questionnaire survey that was conducted with three random groups of students who sat for one of the Entry Tests. The aim of the survey study was to find out (i) students' perceptions and attitude towards the Test, and (ii) the modes of preparation for it. The open-ended questionnaire was bi-lingual because many students are known to have

difficulty in expressing themselves in English. This funded-study, conducted by the writer, was prompted bythe end-of-year written exam and students' poor performance in English (Course HS-101) in two engineering disciplines for two consecutive years. The study did two things: (a) developed a profile of 91 students who failed the English course; and (b) reviewed the poor performance of these students in the ET and found correlation between English and Math sections of the ET and Annual Examination.

Study done on four ETs

A study was undertaken independently to review the first four to verify the assumptions behind the test design and to try and establish the reliability of the instrument, and to establish a correlation between the entrance level language abilities of the undergraduates and their performance at the end of the first year. The study done through questionnaire surveys also provided some interesting data about the students' preparations for the ET. There were some assumptions that were verified through the study, and the findings are as follows:

1. Assumptions (a) – (c) mentioned earlier were borne out to be correct, though there is as yet no data for (d).

2. The admissions are totally free of all manipulations/coercions as the ET has helped to grant admission to candidates on merit alone. At present, the ever-increasing number of children of teachers and employees are of better calibre as they too have to pass the ET in order to be eligible for the limited reserved seats.

3. The ET does not adversely affect candidates from any other Board besides Karachi.

Conclusion

In conclusion, it can be said that the Entry Test designed and administered in an under-resourced public sector university in Pakistan without technological support has been found to be both reliable and valid. The ET has achieved the main objectives stated for it use, and has helped to promote a better culture of learning and participation in academic pursuits. However, the Entry Test has also had some unplanned outcomes, such as, (a) the removal of reserved seats for female applicants has also led to a better gender equity (In some departments such as Architecture, Textile and Bio-Medical Engineering there are sometimes more female than male students). (b) The children of teachers and employees admitted in the recent past have been found to be of better academic caliber and create fewer problems for teachers. And finally, it may be claimed that such a test can be replicated in similar situations and an exchange of ideas may be gainful for both parties (the institution under discussion and the other that will replicate this study).

Note: This article is based on a Paper presented at the 34th Annual Conference of the International Association of Assessment and Evaluation (IAEA) held at Cambridge University from September 7-12, 2008.

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A Case Study of Formative Assessment System as a 'Feed Forward' for Students and Teachers at Senior School Level

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Abstract: *This study explores the impact of formative assessment in School X in Rawalpindi; it is a private English Medium School and follows a formative assessment system. Formative assessment is more effective, efficient and a complete assessment of learning as it includes daily assessment, assessment at key stage, marking of work, providing feedback and feed forward to learners and recording assessments. This study shows that formative assessment enhances the educational attainment and helps in diagnosing the validity of the instructional actions. The assessment allows forming various methods of assessing students, which maximizes student's motivation and prompts their endeavors towards considerable achievements.*

Introduction

The researchers aimed to discover the effectiveness of the formative assessment system, so they looked into the prevailing assessment procedures. Questions addressed were:

- What student qualities and achievements are valued and rewarded by the formative assessment system?
- How are its purpose and intentions realized?
- To what extent are the hopes and ideals, aims and objectives professed by the formative system even truly perceived, valued and striven for by those who make their way within it?

The Researchers selected this particular topic with a view for preparing an in-depth report, which could help in guiding further developmental change in the present system.

One big issue with the School X was that most of the teachers had studied through traditional system and were required to go through a relearning process to adopt any other system of teaching/assessing. An assessment system is a tool to interpret abilities and attitudes of different persons. Dhek (1987) describes assessment in this way, "Assessment in education can be thought of as occurring whenever one person, in some kind of interaction, direct or indirect, with another, is conscious of obtaining and interpreting information about the knowledge and understanding, or abilities and attitudes of that person, to some extent or other it is an attempt to know that person". In this light, assessment can be seen as a human encounter.

Rowntree (1987) considers the issues underlying changing assessment practices asF enduring and timeless. Assessments, he asserts, play a critical role in any educational process. Whenever learning takes place, then it is reasonable for the learner, the teacher and other interested parties to be curious about what has happened both in terms of any anticipated or unanticipated outcomes and of the learning process.

Formative Assessment

Rowntree (1987) suggests that on-going evaluation and assessment have a central role to play in an educational system. **According to him** assessment process has many purposes and for students it is the means to measure the achievements and performance and make predictions about their future capability. As systems are updated and changed the normal problems that face implementers is a lack of knowledge and experience of the methodology in action. 'School X tried to overcome this problem within the organization itself and trained its teachers in evaluation system. However, there was a large turn-over of teaching staff and this reduced the impact of this effort. School X regularly conducted workshops on evaluation and assessment, which were highly valued by the teachers. The methodology adopted to train teachers on evaluation system was, that senior teachers shared their experiences with the new teachers and activities were then carried out jointly by old and new teachers. Furthermore co-ordination meetings were held for quality assurance purposes. With respect to preparation for the external examination papers, the examiners and teachers scrutinized the question papers of internal examination in detail. Each item and question was discussed with teachers and thereafter shared with the pupils. This cycle of evaluation continued after mid-year, final year, and Mock exams.

Significance of the study

It is hoped that through this study, the researchers would become more aware of the issues in assessment faced by senior school teachers, which related to authentic tasks performed within the classroom, or laboratory. It offers an opportunity for evidence based development of more systematic strategies for assessment.

Aims of the study

Knowledge and awareness of formative assessment had been imparted to all staff in the School X. Therefore this research focuses on formative assessment in the senior school.

It has the following aims:

- To review the present assessment policy and practices in the School X.
- To devise and evaluate better strategies for on-going classroom formative assessment.
- To investigate effective ways of providing training to teachers in the better use of formative assessment.

Literature

The advocates of formative assessment are of the view that it provides regular feedback on pupils' learning progress and by evaluation we can know the strengths and weaknesses of instructions. Bryce and Humes (1999) and Doran (1980) share similar opinions about assessment. For them, assessment must achieve the purpose of enhancing skills and abilities and act as a motivational factor and not a deterrent. Hence, a formative assessment plan needs to ensure that all pupils are provided regular feedback on their learning progress. Based on feedback, teachers provide the pupils with targeted instructions to ensure the successful completion of the assessment, to meet the rigorous standards required. Effective formative evaluation indicates the strengths and weaknesses of instructions (Doran, 1980), as well as student's knowledge, understanding and behavior.

People remember their teachers for a variety of reasons, not least in their roles as assessors of what they did in school, but as evaluators of their learning. As Bryce and Humes (1999) hold assessment is more visible and serious now and therefore more demanding of teachers as they have to plan the assessment procedures and tools into their teaching on a regular basis. They further maintain that teachers have to prepare detailed descriptive reports for parents on their children's progress, strengths and development needs. Black and William (1998) suggest that "formative" assessment, properly implemented, is a powerful means to improve student learning but summative assessment such as standardized exams can have a harmful effect. Their evidence shows that high quality formative assessment does have a powerful impact on student learning. Their studies of formative assessment show an effect size on standardized tests of between 0.4 and 0.7, larger than most known educational interventions.

Teachers do not help each other to become good assessors: they often emphasize the quantity of work over high quality work. Their actual assessment practices are often harmful: marking and grading are overemphasized while giving useful advice is underemphasized, and comparing students competitively causes low-achieving students to believe they cannot learn. Some summarizing, in communicating assessment, is probably inevitable. The challenge is to find a method that illuminates rather than remove the uniqueness of the child, and provides 'feed-forward' as well as 'feedback', so that all the recipients of the information can take effective decisions about future action (Ruth, 1995).

It has been established, education is a complex process involving the selection of ideas (concepts, values and skills) and the planning of experience designed to foster mastery of those ideas in the people subject to the educational system programme. Choice must be made in the planning of the educational programme and the effectiveness of the programme must also be studied. Evaluation is therefore, inevitable in education. (Dressel, 1996)

Formative assessment or evaluation can be used to make the process more effective long before the summative evaluation and if used effectively and followed up with suitable remedial work may significantly alter the results. As Bloom et al. (1998) argue that recognition of the interactions among formative evaluation, teaching and learning, and summative evaluation can do much to improve teaching and learning before it is too late. They further maintain that good assessment practice involves a carefully balanced combination of the established procedures for judging young children's progress – observation, questioning, discussion and marking and the use of agreed attainment targets against which to measure those judgments. Teachers use the evidence of written and other tangible work, together with occasional notes of their observations or discussions, in judging children's attainments (Bloom *et al*, 1998).

Methodology

A justified methodological approach of survey and case study was used in this research. The types of data to be gathered are critiqued and discussed and the specific instruments and sample are highlighted and appraised. Related issues of relevance, accuracy, reliability, validity and ethics are also clarified with respect to research protocols, procedures and the conduct and analysis of data.

Ethical Considerations

A concern was that the population to be sampled might not provide authentic and reliable information, considering the status of the researchers, but the researchers made a conscious effort to ensure ethical standards. The following ethical principles were observed in this study:

Informed consent, Voluntary participation, No harm to participants, Anonymity and confidentiality.

Data Collection within the Survey

The Questionnaire: The procedures for designing and administering a questionnaire were carefully followed in order to minimize as much as possible, the problems that a questionnaire can present, such as superficiality of information. The questions were clear and simple, the format was easy to fill and the content was directly related to the study.

Sample: Teachers – 50, Pupils – 100, Parents - 25

Teachers' Questionnaire: The questionnaire designing for data gathering was direct, and was so drafted that it would bring out prior knowledge of formative assessments, its classroom application, its use as a motivation and feed back on learning and teaching, and its recognition as an important aspect of teaching and learning by parents and effectiveness of the existing evaluation system.

Information and response was collected as follows:

- Knowledge of formative assessment — Q 1, 9
- Use of formative assessment as a motivational factor — Q 6, 3
- Classroom application of formative assessment — Q 2, 9
- Parental support so that students excel in formative assessment — Q 4
- Empowerment of teachers in brining about change and improvement — Q 8
- Validity of the existing assessment policy of The 'X' School — Q 10, 7

Students' Questionnaire: The students' questionnaire was designed to evaluate students' understanding of how assessments and feedback facilitate learning, develop responsibility, and peer help and parental support. The link to this and the questions is detailed below;

- How assessments facilitate learning — Q 1, 2, 3, 6
- Feedback of teachers — Q 4, 5, 10
- Peer help — Q 11
- Parental support — Q 9

Parents' Questionnaire: This questionnaire was drafted to elicit information, which would inform the researchers about parents' understanding and knowledge of formative assessments and their importance in aiding learning.

- Knowledge and importance of assessment — Q 1,2 3, 6
- Satisfaction on appropriate use of assessment — Q 5, 6
- Support to wards — Q 8
- Use of course work — Q 6, 7

Interviews

Notes of interviews were taken by the researchers and the headmistress assisted them. Interpretation was matched and contrasted with correspondents after one month.

Interviews: Teachers – 25, Pupils – 25, Parents – 25, Principal - 1

Results

An overview of the data collected has revealed that the population on which the research was carried out is aware that in the changing environment of the educational field, and that formative assessment is the key to effective learning and teaching. Both the teachers and the students are aware of the importance of on-going assessment as they contribute to better, systematic learning. In this way students' thinking skills and good study habits can be developed gradually and systematically over the years. Parents too need to be vigilant and supportive of this process.

The Survey

Parents: Analysis of the 25 Parents' Questionnaire revealed the parents' thoughts about assessment. 76% preferred continuous assessment to periodic assessment. 56% parents were not satisfied with the assessments made by teachers and 76% believed that teachers did not check homework and class work properly. 92% of this sample did not help their children in their studies. 96% agreed that they could access the performance data of their child whenever they wanted but only 8% feel the need to have frequent meetings with teachers and 60% were not aware of their child's weak areas. 84% of parents showed their interest in grades in internal and external exams rather than more general progress. 92% were of the opinion that there is no uniformity in assessment by teachers in the 'X' School and that meetings should take place regularly when measures to be taken by pupils, parents and staff are discussed.

An analysis of Parents' Interviews highlighted a range of mostly summative but some formative understanding of assessment. There seemed to be reasonable knowledge of the 'X' School assessment systems gained through monthly reports, parent teachers meetings and term-exam reports. The parents wished more effective communication especially for the senior level students. Parents were critical here that the teachers did not use course work to help pupils to overcome weaknesses.

Some interesting information was collected regarding the help provided by parents to the children: 28% parents mentioned that at the senior level, subjects are very advanced and specific and they are unable to teach these subjects, 16% parents think that as they have been paying very high fee to the school, therefore it is the school's responsibility to teach them in all respects; 58% students get evening tuitions in coaching centers and 8% parents have a busy schedule due to their jobs and family responsibilities.

Teachers: the analyzed questionnaire found that 94% teachers were ignorant about the concept of formative assessment and only 18% teachers state that they assess their students on a regular basis. 88% of students felt

that these were scared of tests and exams and the staff does not think that regular internal exams will minimize the phobia of external exams. All staff agreed that parents have a significant role to play in their child's learning. The motivation of students can help performance yet 62% of the teachers said they did not regularly praise their students.

Ongoing teachers' training regarding assessment system plays a vital role in the efficiency of work and 68% of teachers feel that they have been lacking in modern techniques of assessment and should train them in this regard. 82% of teachers considered the present evaluation policy ineffective. Teachers' voice in framing a policy has great value but data shows that 70% teachers were of the opinion that they have no say in making the policies.

An analysis of the interviews with teachers revealed that 40% teachers were using formative assessment, 28% diagnostic methods, 20% evaluation methods and 12% summative methods but perhaps without having a clear concept of the difference. 68% of teachers in question 2 agreed that formative assessment had a strong impact on pupil learning. There is no unified criterion of assessment by all the teachers – 34% of teachers presented students homework as evidence, 10% classroom participation, 26% monthly tests and 28% classroom assessments. 76% felt that formative assessment should be implemented at all levels and that it would bring about better external exam results. 64% of the teachers felt that the difficulty of the level of assessment in all subjects was similar, albeit different.

Students: The analysis of students' questionnaire showed that 47% students were willing to be regularly assessed. For them, the significance of class work and homework could not be neglected, and 89% students were of the view that class work and homework should also be given due weight in the assessment process. Grades are considered to be a parameter of performance and learning so 66% students give more weight to grades. In this respect 93% of students admit to working only for grades.

The students responded that 88% of them felt that staff gave them the guidance they needed. However, when marking their work pupils said only 9% of teachers gave remedial comments. The importance of feedback for motivational purposes is recognized by teachers but students felt that 53% of their teachers got annoyed when questions were asked repeatedly and that their attitude was sarcastic. Parental help in learning was only extended to 29% of students and peer help was used by only 17%.

The researchers conducted interviews with students studying for Matric level and it provided the researchers with an opportunity to probe for more depth in their responses. The collated analysis of this information collected through interviews of the students showed that .88% students prefer small tests and gave the following reasons; "More content can be tested, Time saving and Easier to answer"

In response to the question of how they felt tests helped their learning, they responded that they are indicators

indicators of performance, and can help address weak areas. They further felt that they were good preparation for the Board Examinations and they kept them alert and learning on a regular basis. Only 12% students stated they understood the concepts of formative assessment but when the researchers explained the concept of formative assessment to the students 93% students were of the view that it could be a better system of assessment. In response to the number of tests students take a day there was a range from 1-3 each day but even with this frequency only 24% of students felt comfortable in exams. 60% students have no help and support by their parents in studies and 48% of students get help from their peers.

Headteacher/ Principal: The Principal was responsible for looking after all the different sections of the school. Each section was headed by a Headmistress/Senior Mistress.

The following main points were derived from the interview of the Principal. "Each student is discussed in monthly meetings with teachers and Heads of departments. The academic progress, behaviour, attitude, participation in curricular activities and co-curricular activities of students are discussed in detail. Monthly assessments are sent to parents and parents of weak students are called to discuss remedies". The Principal told the researchers that in her experience the majority of parents were interested in grades only and were even apprehensive regarding participation of their children in sports and co-curricular activities. Records were kept by class teachers on a regular basis and submitted monthly and available to parents. The Principal stated that records were used to, "Analyse individual students, Compare pupils, Discuss with parents, Management meetings, Student counseling and Promote to the next class".

When commenting on issues of diagnostic assessment she valued it, as it is individual and problem orientated but that it was time consuming which could lead to ignoring some group problems. Course work assessment was valued as feedback to teachers and students to see areas that were deficient or omitted or prone to errors. She felt in all about 50% assessment was formative in nature.

Conclusion:

This study provided interesting findings. The majority of the teachers expressed lack of knowledge of formative assessment. Parents, teachers and students were mainly concerned about grades.

Grade Conscious:

Parents	84%
Teachers	88%
Students	66%

The table above shows that the percentage of students regarding grade consciousness is lower compared to the parents and teachers, but parents' expectations and teachers' motivation towards grades may cause confusions in the objectives of students, teachers and parents.

Recommendations

Formative evaluation should be regarded for curriculum construction; for instructions and students learning. The most useful method should be searched of reporting the evidence and ways of reducing the negative effect associated with evaluation should be looked for– perhaps by reducing the judgmental aspect of evaluation or at least by having the users of formative evaluation (teachers, students, and curriculum makers) make the judgments.

The unit of learning should be the content covered in a chapter of a textbook or the material covered in one to two weeks of instructions. The delineation of the unit may be arbitrary; ideally it should be determined by natural breaks in the subject matter or by the content that makes a meaningful whole. Teachers should accumulate data on each student as to the effectiveness of each alternative and to prescribe the one or two remedial measures that are likely to work best for him.

Both teachers and students should diagnose learning difficulties, identify persistent misconceptions, and address problem solving deficiencies. Formative assessment should be designed to encourage students to work collectively in small groups, discussing logic leading to an answer. This may allow students to make their reasoning visible to themselves, other students and teachers.

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Concept Mapping Strategy: An Attempt to Transform Rote-learners into Critical Thinkers

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Abstract: *Critical thinking is an important component of higher education in any discipline. Teaching strategies such as reflections, self-directed learning, questioning, and concept mapping, which ask for active engagement of students in their learning, thus fosters critical thinking. Contrary to these strategies, didactic teaching and rote learning is still prevalent in most teaching institutions in Pakistan. This paper reports the findings of a quasi-experimental study in which students at Aga Khan University School of Nursing were taught to use concept mapping strategy. A total of 97 first year nursing students were enrolled in the study. In the pre-intervention phase all students were assessed for their level of self-directed learning and ways of knowing, using two instruments, named SDLRS (Self-Directed Learning Readiness Scale) and WOKAT (Ways of Knowing Assessment Tool). Students were allocated to experimental and control groups based on their WOKAT score. The experimental group students were taught concept-maps development. In the post-intervention phase, all students were reassessed on SDLRS, WOKAT, and GPA, and their scores were compared. Findings revealed significant difference between the GPA scores of control and experimental groups but no substantial changes were noted in their SDLRS and WOKAT scores.*

Introduction

Critical thinking is an important component of higher education in any discipline, including Nursing (Boland, 2005; Boychuk- Duchscher, 1999; Brookfield, 1987, Suliman, 2006). Inspite of this, didactic teaching and rote learning or memorization through repetition is prevalent in most teaching institutions in Pakistan (Davies & Iqbal, 1997; Khalid & Khan, 2006); and nursing education is no exception (Kamal, 1999). Students, who enter nursing, continue to use rote learning predominantly for learning new information. Although rote learning may not be questioned in their basic and secondary educational system, it becomes difficult for them to sift through the course of nursing studies with rote learning.

Nursing students need to learn new terminology, foundational knowledge and basic skills to care for patients, which may be readily absorbed through memorization of information. However, content learnt through memorization could be easily forgotten (Castledine, 2001). Consequently, rote learning is challenged when students need to apply memorized knowledge to real situations in their clinical practice. Students who use rote learning to acquire knowledge do not necessarily have low intelligence, but it is how they are taught to think and learn in their educational experience that determines their learning style. Thus, it is important to assess those students who use memorization as their preferred approach to learning and assist them to modify their ways of knowing and learning.

Nursing faculty can play a key role in assisting such students to give up rote learning by introducing them to meaningful learning strategies such as concept mapping. Ausubel, Novak, and Hanesian (1986) explained that meaningful learning occurs when a learner is able to connect new knowledge to relevant concepts already known. Drawing from Ausubel et al.'s (1986) work, Daley (1996) pointed that teaching adult learners to broaden their thinking and to utilise strategies that foster a constructivist approach to learning is challenging.

As the complexity and amount of nursing knowledge continues to increase, nurse educators are challenged to develop strategies that help students focus on how to learn instead of what to learn. The literature reveals that teaching strategies, such as reflective journaling, questioning, and concept mapping helps to promote meaningful learning and critical thinking (Daley, Shaw, Balistrieri, Glasenapp, & Piacentine, 1999; Gul & Boman, 2006; Simpson & Courtney, 2002).

Concept Mapping is a teaching and learning strategy that actively engages learner and assists in developing their critical thinking ability. It is considered to be a creative learning tool. Both teachers and students find it useful for constructing new knowledge by linking it to the learnt knowledge, and for making connections to illustrate the assimilated idea or concept (Conceicao & Taylor , 2007; All, Huycke, & Fisher, 2003). As no study on concept mapping in Pakistani context was available, we wanted to explore the effectiveness of concept mapping strategy in our country context, where rote learning is the predominant way of studying.

Literature Review

Fundamentally, concept maps (CMs) are referred to as cognitive metaphors that act like a window to the brain of the learner. They are constructed from selected concepts and linking words or symbols and are considered "organizational tools" to promote meaningful learning" (Novak, 1992, p.1). The concepts or themes are enclosed in boxes or symbols of different shapes and the complete pictorial illustration shows linkage and relationship of the sub concepts to each other. The arrangement can be in different forms such as; spider maps, hierarchy maps, flow charts and system maps, in which the presentation of the concepts is arranged according to a particular way of order and relationship (All et al., 2003).

CMs allow students to be in control of their learning and to be more confident in their ways of knowing (All & Havens, 1997; Daley et al., 1999; Novak, 1992; Novak & Gowin, 1984). These scholars also explicate that concept mapping is a creative technique that actively engages learner in cognitive, affective, and psychomotor learning. According to Hicks-Moore (2005), it is through such active engagement, students understanding of concepts is enhanced, and it becomes easier for them to integrate theory into practice. Hence, concept maps facilitate the acquisition of new knowledge by integrating it with previously learnt concepts resulting into a continuous meaningful learning. Moreover, constructing and assimilating new knowledge results in deeper and higher order learning, stimulating their critical thinking capacity (Conceicao & Taylor, 2007).

Adoption of concept mapping strategy by learners is a learned process, which requires step by step facilitation by the experts in developing CMs and consistent practice by the learners. Literature presents varying reports

on the time and approach required to develop concept maps, but, in general it is suggested that up to three sessions over a two-week period are needed to assist students in learning how to develop concept maps, whether individually or in groups (Caelli, 1998; Daley, 1996; Roberts, Sucher, Perrin, & Rodriguez, 1995). individually or in groups (Caelli, 1998; Daley, 1996; Roberts, Sucher, Perrin, & Rodriguez, 1995). Literature indicates that the use of CMs has significant advantages. Irvine (1995) reported that when students adopted concept mapping for learning it became an "integrated educational experience, and claimed enhancement of meaningful learning" (p.1179). Since it offers a metacognitive approach to critical thinking and concept synthesis (Beissner, 1992; Wheeler & Collins, 2003), many scholars view concept mapping as a teaching strategy for the development and evaluation of critical thinking (All and Havens, 1997; Chenoweth, 1998; Daley et al., 1999; Luckowski, 2003; West et al., 2000). Since CMs involve a visual representation of students' interpretations of ideas and concepts, it is possible for the teacher to follow the students' thinking (Gul & Boman, 2006). Moreover, it is easier for the students to see the gaps in their thinking and understanding, which becomes an inspiration for further learning (Wheeler & Collins, 2003).

Writers have also identified barriers to the use of concept maps (All & Havens, 1997; Chenoweth, 1998; Roberts et al., 1995; West et al., 2000). They have pointed out that development of concept maps is time consuming, as it requires students to first identify concepts from their readings and then to think for the link words to relate one concept to another before putting it on a paper.

A number of studies have used concept mapping strategy for assessing acquisition of knowledge, and enhancement of problem-solving and critical thinking abilities (Beissner, 1992; Daley et al., 1999; Staib, 2003). Concept mapping has also been used for teaching of Pathophysiology (Cannon, 1998; Reynolds, 1994), for the preparation of clinical experience in nursing courses (Baugh & Mellott, 1998), and in professional development (Wade, 1998).

Beissner (1992) reported that students who used concept mapping to develop linkages between patient problems and interventions showed better problem-solving ability than those who did not. Likewise, Wheeler and Collins (2003) explored the effectiveness of concept mapping in developing students' critical thinking skills, using a pre and post test design. They measured students' critical thinking on California Thinking Skills Test (CCTST) but found no significant differences between the groups, however, significant differences within the experimental group after the intervention were noted. While, there is growing evidence in the literature that concept mapping enhances students' critical thinking and problem solving ability, most of these studies are conducted in the Western countries. None of the studies have looked at whether CMs can affect students' predominant style of learning, which is presumed to be rote learning in Pakistan.

Purpose of the Study

The study was undertaken to assist nursing students in adopting a more problem-solving approach that is concept mapping, instead of rote-learning or memorization as their dominant approach, to acquire knowledge

upon entering into the program. Specifically, the study questions are:

1. What is the students' dominant way of acquiring knowledge in the first year of their nursing program at Aga Khan University School of Nursing?
2. What is the relationship between rote learning and students' self-directed learning readiness?
3. Will nursing students used to rote learning demonstrate greater conceptual thinking skills after they are taught to use concept mapping skills?
4. Is there a relationship between the students' use of concept mapping for guiding their learning and academic success in nursing programs?

Methods

Design

This study utilized a pre-test post-test time-measured quasi-experimental design.

Setting and Sample

The study was conducted at Aga Khan University School of Nursing (AKU-SON) in 2003. All year I students (N=120) from diploma in the Registered Nursing (RN) and Bachelor of Science in Nursing (BScN) programs were invited to participate. Total 97 students consented but 95 students completed the pre-assessment tests, thus the response rate was 97%.

Data Collection Instruments

In addition to students' demographic variables, such as age, gender, and educational background, three instruments, Guglielmino's Self-Directed Learning Readiness Scale (SDLRS); Ways of Knowing Assessment Tool (WOKAT) and a modified version of Roberts et al.'s instrument for adoption of concept mapping (1995) were used in this study.

SDLRS tool assesses a person's perceived ability to be self-directed learners (Brochett & Hiemstra, 1991, p. 56-7). It consists of 58 items, measured on a 5-point likert scale (from almost never to almost always). The instrument has a reported reliability coefficient of 0.87. WOKAT is 33-item questionnaire, partially developed by Dr. Carol Orchard and her colleagues at the Memorial University, Canada, in which 16-items are incorporated from Bucynski's WOKI (Ways of knowing Instrument). Responses are measured on a 4-point Likert scale from "strongly disagree to strongly agree". WOKAT has five constructs: (a) silence—no reliance on external sources of knowledge; (b) received knowledge —reliance on listening for acquiring knowledge; (c) subjective knowledge—use own thinking to construct knowledge; (d) procedural knowledge—use a process for acquiring knowledge and solving problems; and (e) constructed knowledge—acquiring knowledge through a variety of sources with critical consideration of others' views. It assesses stages of women's way of seeking knowledge and identifies learners' dominant pattern of seeking knowledge, such as rote learning or constructing knowledge which is reflective of critical thinking. The Bucynski instrument has an alpha coefficients of .69 for silence, .69 for subjective; .72 for received; .74 for constructed; and .80 for procedural knowledge (Buczynski, 1993).

The adapted instrument was piloted for validity with second year nursing students at AKU-SON and some revisions in language were made. The alpha coefficient for the revised tool is 0.74. The modified version of Roberts et al.'s (1995) tool consisted of both closed and open ended questions to assess students' educational priorities and attitudes about the effectiveness of concept mapping.

Procedure for Data Collection

Approval from the Ethics Review Committee at AKU was obtained. All Year I nursing students in their second semester was invited to participate in the study. Those willing to participate signed a written consent form. In the pre-test phase, participants completed two instruments i.e. SDLRS and WOKAT. The biographical data of students was obtained from the record office. After the pre-test analysis, the scores in WOKAT were used for assigning students to experimental and control groups. Those students who scored high in *the silent* or in the *received knowledge* items but low in the procedural and constructed knowledge were selected for experimental group. In contrast, students who scored high in procedural and constructed knowledge items but low in the *silent* or in the *received knowledge*, were assigned to the control group. Some students who had similar scores on all constructs; were assigned to both experimental and control group based on their Grade Point Average (GPA) scores of semester I of year I. Those students who had comparatively low GPA were assigned to the experimental group and the rest were assigned to the control group based on the researchers' assumptions that students having higher GPA are more likely to be critical thinkers and may not be dependent to seek knowledge via silence or received mode. Using the said measures, of the 95 students, 41 were identified for the experimental group, out of which 30 came to attend the intervention.

Students in the experimental group were introduced to CMs and its development in four sessions of two hours each. The first session focused on the basics of what learning is and how it occurs including learning for creating meaning, and cognitive processing and importance of taking responsibility for self learning. In the second session, students were taught how to develop CMs. In the third session, students were guided to develop a concept map, identifying key concepts from their Anatomy and Physiology course learnt in the previous week. Students compared their maps with the subject experts' maps discussing similarities and differences and finalized their concept map. In the last session, the students came with a prepared CM of their own choice and sought guidance and feedback. They were also given samples of CMs for different courses and topics that they had studied in the previous weeks in a didactic manner. They were encouraged to continue developing CMs and share with their peers and, if need be, approach any member of the research team at their own convenience from then onwards.

At the end of the 18-week semester, all students who had gone through the pre-assessment phase were invited to complete the post intervention questionnaire. Students in the experimental group were asked to complete a set of three questionnaires: namely; SDLRS, WOKAT and, Roberts et al.'s instrument for adoption of concept mapping, whereas the rest of the students were required to complete SDLRS and WOKAT only.

Analysis of Data

The data was entered in EPI INFO version 6.04 and analysis was performed in SPSS software version 12.0. Descriptive statistics were generated for variables related to students to ascertain the patterns of distribution, which included means and standard deviation for continuous variables and proportions for categorical variables. Likewise, Independent sample t-test was used for comparing scores among control and experimental group, where as chi-square was used to compare the students' preferred ways of knowing in the BScN and GND programmes. In all these comparisons, p-value of less than 0.05 was taken as significant.

Results

94% of the students were females and the mean age of the students was 19.9 years, with a range of 18-25 years.years. The majority (n= 73) of the students were from Karachi, 9 from Sindh, 12 from NWFP and Punjab, whereas one international student was from Nairobi. In terms of basic schooling, nearly 40% of the students had 12 years and the rest of them had 10- 11years of education. Of the 95 students, 34 were lost in the process and 61 students were able to complete the study. However, 5 questionnaires (2 in experimental and 3 in control) were returned incomplete; hence, the post intervention result accounts for 56 students.

The pre-test scores for SDLRS ranged from 174 to 251(X = 215.63, SD = 17.256). The distribution of scores, indicating various levels of readiness for self-directed learning among the students, is presented in table 2. Based on stated figures, the majority (59%) of the students had average readiness for self-directed learning. Whereas 23% showed above average and 18% showed less than average readiness for self-directed learning.

Table-2: Distribution of Scores for Self Directed learning Readiness

Levels of Readiness for SDLRS	**Cut off range**	**Number and % of students**
Low readiness	58 – 176	01 (1.6%)
Below average readiness	177 – 201	10 (16.4 %)
Average readiness	202 – 226	35 (59.0 %)
Above average	227 – 251	14 (23.0%)

With regard to measuring students' responses for dominant ways of acquiring knowledge, the findings in Table 3 indicate no clear pattern. With the exception of silence mode, the majority of the students seemed to use multiple ways of acquiring knowledge. Although 56% of the students indicated the use of silence, at least 44% were not used to acquire knowledge that way.

Table 3: Way of Acquiring Knowledge in the First Year of the Program

Constructs of WOKAT	Strongly Agree/ Agree			Disagree/Strongly Disagree		
	Score	*Number of Students*		*Score*	*Number of Students*	
Silence	<15	34	(55.7%)	> 15	27	(44.3%)
Received Knowledge	<18	60	(98.4%)	> 18	01	(1.6%)
Subjective Knowledge	< 21	57	(93.4%)	> 21	04	(6.6%)
Procedural Knowledge	< 24	60	(98.4%)	> 24	01	(1.6%)
Constructed Knowledge	< 21	60	(98.4%)	> 21	01	(1.6%)

Using a Chi-square test, no significant association was found between the students' scores for WOKAT and SDLRS (See Table 4). Hence, there was no relation in the students' ways of learning, including rote learning (indicated by their scores on silence and received mode of learning), and their perceived ability for self-directed learning readiness.

Based on the independent t-test for comparing the students' pre and post-intervention scores on WOKAT and SDLRS, no significant difference was found between the control and experimental group. However, significant difference (2.21 at p-value 0.037) was found in the GPA of the control and experimental groups after the intervention. Likewise, the majority of the students who relied more on the constructed mode of acquiring knowledge had a GPA of 3 or above out of 4.

Table 4: Relationship of WOKAT and SDLRS

Constructs of WOKAT		Students' self directed learning readiness			P Value
		Below average	Average	Above average	
Silence	**Agree**	**07 (63.6)**	**20 (55.6)**	**07 (50)**	**0.792**
	Disagree	**04 (36.4)**	**16 (44.4)**	**07 (50)**	
Received knowledge	**Agree**	**11 (100)**	**36 (100)**	**13 (92.9)**	**0.181**
	Disagree	**0**	**0**	**01 (7.1)**	
Subjective knowledge	**Agree**	**9 (81.8)**	**35 (97.2)**	**13 (92.9)**	**0.195**
	Disagree	**02 (18.2)**	**01 (2.8)**	**01 (7.1)**	
Procedural knowledge	**Agree**	**11 (100)**	**36 (100)**	**13 (92.9)**	**0.181**
	Disagree	**0**	**0**	**01 (7.1)**	
Constructed knowledge	**Agree**	**11 (100)**	**36 (100)**	**13 (92.9)**	**0.181**
	Disagree	**0**	**0**	**01 (7.1)**	

P value is obtained from chi-square test of independence

Assessing the effectiveness of concept mapping use in the experimental group, students' responses to the modified questionnaire, by Roberts et al., are summarized below as themes.

Students' Ways of Studying New Material

Prior to the intervention, 43% of students were used to learning new material by reading for meaning and understanding, whereas 31% of students used to memorize from books or teachers' notes. Another 13% learnt new material by group study, and the remaining 13% used to make diagrams or flow charts to study new material. After learning concept mapping during the semester, 80% students felt that CM is a valuable tool for learning new material, and even though it is difficult, and time consuming, it makes learning more meaningful. One student expressed the reason of her comfort with this strategy by stating "practice made me perfect."

Usefulness of Concept Mapping

Students were asked if their approach to study had changed since their participation in the concept mapping session. Majority (87%) of the subjects affirmed with positive comments such as "it helps me to remember difficult concepts", "helps in better retention", "gives sequence in my thoughts to perceive new things", "learnt the efficient use of time" and "learning is enjoyable and easy with concept mapping." However, 13% of the subjects did not experience any change in their approach to studying after participation in the concept mapping sessions.

The students identified some reasons for not adopting the concept mapping approach, such as that it is "time consuming", "does not match with the way exams are given which is MCQs" ,"finding the key terms or the link words is challenging" and "summarizing the content is difficult as everything appears important". Some students highlighted the importance of practicing more as one eloquently expressed: "concept mapping approach seems difficult in the beginning but gets easier over time". Nonetheless, some students did not appreciate the idea of introducing this new CM strategy in the middle of the semester as commented "teaching concept mapping in mid semester, when there are other assignments is not appropriate; if I change my way of learning I will have problem, I need time to think".

Application of Concept Mapping in Nursing Education

The students were asked about the application of concept mapping strategy in nursing and non nursing courses. 80% responded that they were able to use the CM strategy in other than Anatomy and Physiology course, such as Adult Health Nursing, Community Health Nursing, Nursing Ethics, Pharmacology and Microbiology. Interestingly 53% suggested that the concept mapping strategy should be used by course teachers to increase their understanding and to make learning fun and enjoyable.

Limitations of the Study

Although the researchers had a good grasp of concept mapping, many teachers in the school were not very familiar with CM strategy. Consequently, students were not encouraged to use concept mapping in the course work. Some students felt that learning CM in the middle of the second semester was not an ideal time as they

have course work pressure and time limitation to think and modify their study habits. In addition, many students attended the first 3 sessions in the intervention but could not attend the independent practice and feedback session. As a result, students had limited practice time for concept mapping. Although the initial response for students' participation in the study was 97%, the attrition rate (nearly 36%) was quite high. Thus, the generalisability of the findings is limited due to a small sample size.

Discussion and Conclusions

This study revealed that AKU-SON students use multiple ways of learning, instead of any one dominant way of learning, as presumed earlier. The study ascertained the positive value of CM as an active teaching strategy. Quantitatively, WOKAT and SDLRS results did not reveal statistical difference between the students' ways of knowing and learning readiness after their exposure to concept mapping. However, significant difference ($p < 0.5$) in the students' pre and post intervention GPA scores in the control and experimental groups were identified, which indicates that students' academic success was enhanced with the use of CM strategy. The students' qualitative data was encouraging and supported the findings of other researchers in favour of using concept mapping in nursing education (Chenoweth, 1998; Irvine, 1995). Students indicated that once concept mapping is learned, it becomes a useful study strategy for learning, and as they become more comfortable in its use, it becomes a study habit. Moreover, as noted by Daley et al. (1999) the participants' affirmed that learning to develop CMs requires investment of time for practice. Students indicated that their comfort to use CMs can be enhanced by better facilitation from course teachers who have expertise in CM. The finding that student will more readily adopt CMs for learning when it is also used for student assessment, can be well understood from the Knowles's (1980) theory of adult learning, which maintains that the need to learn is prompted by it usability. Thus it can be concluded that although CM may be initially challenging for students, it makes learning enjoyable, meaningful and enduring.

Recommendations

To make this strategy more plausible to students, concept mapping must be introduced to students in their first semester of the program so that it becomes a part of the students' "study habit". It is important that before teaching to students, all teachers must be trained to become expert in developing CMs related to their subject. CMs must be used first as a teaching learning strategy at AKU-SON for classroom discourse and clinical preparation before it is used as a student assessment or evaluation strategy. Lastly, it is recommended that the study be replicated with proposed longitudinal design and a larger sample in multiple schools so that the results can be generalized.

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PARE ACTIVITIES AT A GLANCE

January, 2008--March, 2009

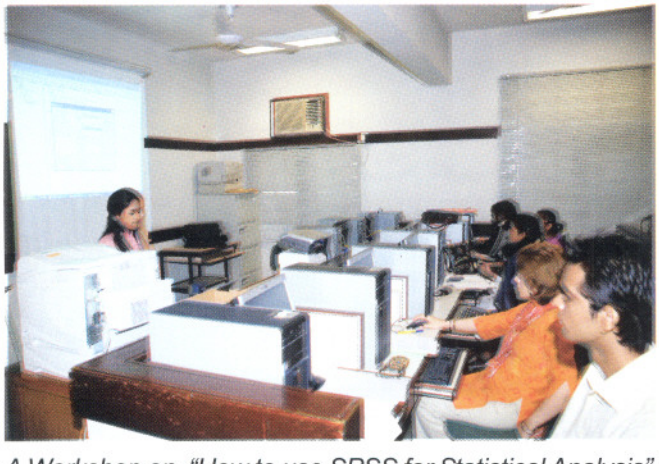
PARE has successfully conducted a range of activities including workshops, seminars, and a large international conference. According to the information received from the PARE secretariat during the time period noted above PARE conducted 13 research workshops. These workshops were led by national and international experts. On average 20 participants from public and private sector institutions participated in each of these workshops, which have invariably been highly rated. In addition in November 2008, PARE organized a large conference which was hosted by the Institute of Educational Development in Karachi. More than 350 participants attended the conference.

In its short span of existence PARE also became a member of the World Educational Research Association (WERA)

Provided below are a few glimpses from PARE activities.

Group picture of Conference organizers and working group team. Dated: November 22, 2008

Member of World Education Research Association meet in San Diego on April 25, 2009



A Workshop on, "How to use SPSS for Statistical Analysis" being conducted as a part of PARE activities.

Mr. Abbas Rashid, convener of Campaign for Quality in Education (CQE) and the Keynote Speaker for the First PARE Conference being presented a bouquet by the chair PARE Conference

GUIDELINES FOR AUTHORS

1. Manuscripts in English should be submitted both in soft and hard copy to the Editor, PARE research bulletin at the address provided below.
2. Manuscript should be within the range of **3000-4000** words including an abstract of 150-200 words
3. The first page should only provide the title of the article and the name(s) of the author(s).
4. Authors are advised to follow the latest Publication Manual of the American Psychological Association, for formatting and referencing.
5. Articles will be reviewed by experts in the field

For further information and submission of articles contact PARE secretariat at Pare.secretariat@aku.edu or

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