

Hybrid Recommender System for Assessment in Multi-Constraint Academic Paradigm: A Review

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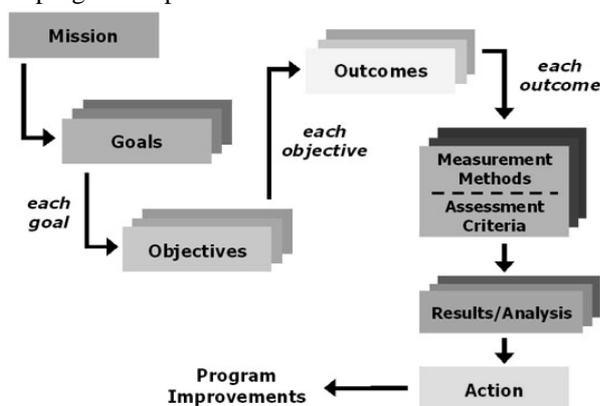
Abstract

Assessment is essential not only to guide the development of individual students but also to monitor and continuously improve the quality of programs, inform prospective students and their parents, and provide evidence of accountability to those who pay our way. Various definitions of assessment and the role it plays in teaching and learning:^[1] Assessment involves the use of empirical data on student learning to refine programs and improve student learning. Assessment is the process of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what students know, understand, and can do with their knowledge as a result of their educational experiences.^[4]

Keywords: Recommender, Hybrid, Assessment, Paradigm, constraint

1. INTRODUCTION

An Assessment Plan includes all these components and focuses on the assessment of each learning outcome and how the evaluation of the results of the assessment is used for program improvement^[15].



2. OBJECTIVES

After studying thoroughly all above literatures, I as a researcher found few following problems for assessment activities such as :

2.1 For improvement and impartial assessment of each stake holders should understand his inclinations, mistakes and misunderstanding about assessment system.

2.2 One should give proper justice to the answers presented by the students against introspecting the optimistic, pessimistic and overvaluation attitudes of the examiners^[11].

2.3 Finding the reasons behind not attempting the particular question by majority of the students and informing the lacuna to the paper setter and teachers covering the syllabi to fulfill the objectives of the curriculum or through knowledge.

3. REVIEW OF LITERATURE

3.1 Review: International : “Does assessment for learning make a difference? The development of a questionnaire to explore the student response.”

Assessment & Evaluation in Higher Education Vol. 36, No. 7, December 2011, 749–765 By Routledge –Taylor & Francis Group

Assessment for learning (AfL) is a popular and widely used term but definitions vary, and the term is often used in an unclear and ill-defined way by different authors and in various contexts. This led Paul Black, an influential figure in the field, to claim that AfL is now ‘a free brand name to attach to any practice’ (2006, 11). In this paper, we set out a conceptualization of AfL in higher education and introduce a questionnaire which has been used to explore the student experience of AfL. We describe the development of the questionnaire and its use for evaluation and research purposes in relation to AfL in higher education contexts^[10]. Preliminary findings suggest that students do respond positively to modules delivered using AfL principles and that within such modules there is a higher level of use of deep approaches to learning when compared with modules that have not used AfL approaches^[23].

This Research article indicates that the overall student experience is more positive in modules where AfL approaches are used. The AfLQ questionnaire demonstrates that students are sensitive to AfL approaches

and react more positively to AfL modules in comparison with non-AfL modules.

3.2 Review : International : An assessment of academic stress among undergraduate students: The case of University of Botswana by Joseph E. Agolla and Henry Ongori Educational Research and Review Vol. 4 (2), pp. 063-070, February 2009, ISSN 1990-3839 © 2009

This research finding is based on the responses obtained from the undergraduate students at a higher learning institution (University) in Botswana. This paper investigated the stressors, symptoms and effects that are likely to be experienced by the undergraduate students in higher institutions (Universities). Stressors related to time, academic pressure, and academic environments were explored. A total of 320 students participated in this study. Data was collected through self administered questionnaires that were randomly distributed to the students during lecture time. Data obtained was analysed using descriptive statistics and Tables. The open ended question was thematically analysed and the result presented in Table 5^[8]. It was found out that, academic workload, inadequate resources, low motivation, poor performance in academic, continuous poor performance in academic, overcrowded lecture halls, and uncertainty of getting job after graduating from the university lead to stress among students.

3.3 Review: National :Elitist-Multi-objective

Differential Evolution for Multiple Question Paper

Generation- International Journal of Web Applications (IJWA) Vol-6 No-2 June 2014 by Dimple V. Paul1, Jyoti D. Pawar

Student evaluation is an essential part of education and is done through the system of examinations. Examinations generally use question papers as an important component to determine the quality of the students. Examination question paper generation is a **multi-constraint concurrent optimization problem**. Question papers generated with random and backtracking algorithms are inefficient in handling multiple constraints such as total time for completion of the paper, total number of questions, module weight ages, question types, knowledge points, difficulty level of questions etc.,. In this paper they have proposed an innovative evolutionary approach that handles multi-constraints while generating question papers from a very large question bank. The proposed Elitist Multi-objective Differential Evolution Approach (EMODEA) has its advantage of simple structure, ease of use, better computational speed and good robustness^[7]. It is identified to be more suitable for combinatorial problems as compared to the generally used genetic algorithm. Experimental results indicate that the proposed approach is efficient and effective in generating near-optimal or optimal question papers that satisfy the specified requirements.

3.4 Review: National : Use of Common-Word Order Syntactic Similarity Metric for Evaluating Syllabus Coverage of a Question Paper- International Journal of

Web Applications (IJWA) Vol-6 No-2 June 2014 by Dimple V. Paul1, Jyoti D. Pawar

Syllabuses are used to ensure consistency between educational institutions. A modularized syllabus contains weight-ages assigned to different units of a subject. Different criteria like Bloom's taxonomy, learning outcomes etc., have been used for evaluating the syllabus coverage of a question paper^[24]. But they have not come across any work that focuses on syntactic text similarity evaluation of unit contents with the question contents in order to estimate the syllabus coverage of a question paper. Hence in this paper they address the problem of measuring the syllabus coverage of an examination question paper by using the **order based word-to-word syntactic similarity metric**. Text preprocessing techniques are used to extract multiple words and its associated locations from textual contents in the question paper and also in the respective syllabus file. Comparison of word order vectors of units with word order vectors of questions results in generation of the corresponding common word pair question vector and common word pair syllabus vector^[13]. The common word pair vectors assist in computing the similarity measure between question vector and unit vector, representing the similarity measures in a question-to-unit similarity matrix and selecting the maximal similarity measure among the set of computed common word pair vectors^[31]. The maximal similarity measures are used as a guideline in grouping the unit-wise questions, matching its weight-age against Syllabus File and evaluating the syllabus coverage of the question paper. The result of syllabus coverage evaluation can be used as a guideline by the subject expert or question paper setter or question paper moderator to revise the questions of examination question paper accordingly

3.5 Review: The Case for Authentic Assessment.

Practical Assessment, Research & Evaluation, 8(14). November 20, 2014 - A peer-reviewed electronic journal. ISSN 1531-7714 by Grant Wiggins, Mr. Wiggins, a researcher and consultant on school reform issues, is a widely-known advocate of authentic assessment in education^[14]. This article is based on materials that he prepared for the California Assessment Program.

Assessment is authentic when we directly examine student performance on worthy intellectual tasks. Traditional assessment, by contract, relies on indirect or proxy 'items'-efficient, simplistic substitutes from which we think valid inferences can be made about the student's performance at those valued challenges^[24].

Further comparisons with traditional standardized tests will help to clarify what "authenticity" means when considering assessment design and use:

- Authentic assessments require students to be effective performers with acquired knowledge.
- Authentic assessments present the student with the full array of tasks that mirror the priorities and challenges found in the best instructional activities.

- Authentic assessments attend to whether the student can craft polished, thorough and justifiable answers, performances or products^[27].
- Authentic assessment achieves validity and reliability by emphasizing and standardizing the appropriate criteria for scoring such (varied) products.
- "Test validity" should depend in part upon whether the test simulates real-world "tests" of ability.
- Authentic tasks involve "ill-structured" challenges and roles that help students rehearse for the complex ambiguities of the "game" of adult and professional life.

3.6 Review: Defining Authentic Classroom Assessment-

Practical Assessment, Research & Evaluation- A peer-reviewed electronic journal, Volume 17, Number 2, January 2012 ISSN 1531-7714, Bruce B. Frey, University of Kansas Vicki L. Schmitt, Logan-Rogersville School District, Rogersville, MO Justin P. Allen, University of Kansas

This study presents a conceptual analysis of authentic as it is used in educational research and training to describe an approach to classroom assessment. Nine distinct components or dimensions of authenticity are identified and only one of those is the realistic nature of the assessment.

A well accepted position among educational researchers and teacher educators is that the *best* classroom assessments are authentic^[10]. The term *best* typically means valid, and authentic is usually defined as having something to do with the real world^[3]. This position is difficult to translate into an assessment strategy, however, for two reasons. First, validity is not a characteristic of any assessment; it refers to the interpretation and use of assessment results. Secondly, there are a variety of definitions of authenticity presented in the research literature and in books and other materials used to train teachers.

In this article four basic characteristics of authentic tests are included:

1. The task should be representative of performance in the field.
2. Attention should be paid to teaching and learning the criteria for assessment.
3. Self-assessment should play a great role.
4. When possible, students should present their work publicly and defend it.

3.7 Review: Recommendations for Developing Classroom Performance Assessments and Scoring Rubrics-

Practical Assessment, Research & Evaluation, 8(14). November 20, 2014 - A peer-reviewed electronic journal. ISSN 1531-7714 by Barbara M. Moskal, Colorado School of Mines.

This paper provides a set of **recommendations** for developing classroom performance assessments and scoring rubrics similar to the sets of **recommendations** for multiple choice tests^[10]. The recommendations are divided into five categories: 1) Writing Goals and Objectives, 2) Developing Performance Assessments, 3) Developing Scoring Rubrics, 4) Administering Performance

Assessments and 5) Scoring, Interpreting and Using Results. A broad literary base exists for each of these categories. This article draws from this base to provide a **set of recommendations** that guide the classroom teacher through the four phases of the classroom assessment process -planning, gathering, interpreting and using^[15].

Developing Scoring Rubrics Scoring rubrics are one method that may be used to evaluate students' responses to performance assessments^[33]. Two types of performance assessments are frequently discussed in the literature: analytic and holistic. Analytic scoring rubrics divide a performance into separate facets and each facet is evaluated using a separate scale. Holistic scoring rubrics use a single scale to evaluate the larger process. In holistic scoring rubrics, all of the facets that make-up the task are evaluated in combination. The recommendations that follow are appropriate to both analytic and holistic scoring rubrics.

4. CONCLUSIONS

As a researcher after studying thoroughly all above literatures, found few gaps and problems for assessment activities where there are several constraints and methods of assessment which hampers the career of the student and the reputation of the Educational Organization. To conclude this research area, that through some recommender system which is based on scientific methods and formulas and mining algorithms. In this study Hybrid Recommender System is used because it captures both collaborative and content based recommender system. Dependence on the assessing regulation for different syllabus patterns of the organization, the proposed system can handle and suggest the appropriate solution to the problems.

References

- [1]. Nidhi Genda- 'online exam system' International Journal of Computer & Mathematical Sciences(IJCMS) ISSN 2347 – 8527 Volume 3, Issue 9 November 2014
- [2]. Fagbola Temitayo M., Adigun Adebisi A., Oke Alice O "Computer-Based Test (Cbt) System For University Academic Enterprise Examination" ,International journal of scientific & technology research volume 2, issue 8, ISSN- 2277-8616, August 2013.
- [3]. O.A. Agbaji, O.T.Ruth and M.B. Soroyewun (2010), "Development of an E-Assessment Platform for Nigerian Universities", Research Journal Applied Sciences, Engineering and Technology 2(2): Page 170-175, ISSN: 2040-7467.
- [4]. I.M.M. Emary El and J.A.A. Abu (2006), "An Online Website for Tutoring and E-Examination of Economic Course", American Journal of Applied Sciences 3 (2): Page 1715-1718, ISSN 1546-9239
- [5]. A. Huszti and A. Petho (2008), "A Secure Electronic Exam System", Informatika felsőoktatásban. Page 1-7.
- [6]. B. Ipaye (2009), "E-Learning in a Nigerian Open University", National Open University of Nigeria, page 1-11.

- [7]. H. Lei (2006), "A novel web-based educational assessment system with Bloom's Taxonomy", *Current Developments in Technology-Assisted Education*. Page 1861-1865.
- [8]. Y. Levy and M.M. Ramim (2007), "A Theoretical Approach for Biometrics Authentication of e-Exams", *Nova Southeastern University, USA*. Page 93-101.
- [9]. M.Z. Rashad, M.S. Kandil, A.E. Hassan and M.A. Zaher (2010), "An Arabic Web-Based Exam Management System", *International Journal of Electrical & Computer Sciences IJECS- IJENS Vol: 10 No: 01*. Page 48-55.
- [10]. Y. Zhenming Y., Z. Liang and Z. Guohua (2003), "A Novel Web-Based Online Examination System for Computer Science Education", *33rd ASEE/IEEE Frontiers in Education Conference, S3F-7-S3F-10*.
- [11]. F. Andrew, Darren Pullen and Colleen Harper (2009). "Case study of a computer based examination system" *Australian Journal of Educational Technology*, 25(4), 509- 523
- [12]. Biggs, J. (1997) "Enhancing teaching through constructive alignment." *Higher Education*. 32,347-64
- [13]. Brown, S., and Dove, P. (eds) (1991) "Self and Peer Assessment." Birmingham: SCED Paper 63.
- [14]. Ewell, Peter (editor) (1985) *Assessing Educational Outcomes. New Directions for Institutional Research #47*. San Francisco: Jossey-Bass.
- [15]. "Fairness." *The National Teaching and Learning Forum*. 3 (1993): 5.
- [16]. "How Devalued is Teaching?" *Teaching, Learning, & Assessment Newsletter*. NCPTLA, 2 (Winter 1993).
- [17]. Hutchings, Pat (1990). "Assessment and the Way We Work." *Fifth AAHE Conference*. June 30, 1990.
- [18]. Jones, Robert M. and John E. Steinbrink (1993). "Assessment Planning: Measuring Improvement in Teaching." *The National Teaching and Learning Forum*. 2 (1993): 7-8.
- [19]. Kelly, Diana K. (1993). *Classroom Research and Interactive Learning: Assessing the Impact on Adult Learners and Faculty*. Unpublished doctoral dissertation, The Claremont Graduate School. (Available through Dissertation Abstracts).
- [20]. Lenning, Oscar T. (editor) (1976) *Improving Educational Outcomes. New Directions for Higher Education #16*. San Francisco: Jossey-Bass.
- [21]. Light, Richard (1990). "The Harvard Assessment Seminars: Explorations with Students and Faculty about Teaching, Learning and Student Life." *Graduate School of Education and the Kennedy School of Government*.
- [22]. Magel, Kenneth and Rhonda (1994). "Using Classroom Assessment to Overcome Problems." *Lilly Conference*.
- [23]. Mikka, Kathleen F. and Monica Garcia (1994). "What Works?: Learner Centered Ideas for Checking Teaching Effectiveness." *Lilly Conference*.
- [24]. Palmetier, Laurie and Jeanne Ballantine (1994). "Formative Self-Assessment Techniques: The Kudos Approach." *Lilly Conference*. Ratcliff, James L. (editor) (1992)
- [25]. Terenzini, Patrick T. (1989) "Assessment with Open Eyes: Pitfalls in Studying Student Outcomes." *Journal of Higher Education* 60: 644-664, November/December, 1989.
- [26]. Skeff KM, Stratos GA, Mygdal WK, et al. *Clinical teaching improvement: past and future for faculty development*. *Fam Med*. 1997;29:252-7.
- [27]. Wilkerson L, Irby DM. *Strategies for improving teaching practices: a comprehensive approach to faculty development*. *Acad Med*. 1998;73:387-96.
- [28]. Clark JM, Houston TK, Kolodner K, Branch WT, Levine RB, Kern DE. *Teaching the teachers: National survey of faculty development in departments of medicine of U.S. teaching hospitals*. *J Gen Intern Med*. 2004;19:205-14.
- [29]. Skeff KM, Stratos GA, Mygdal W, et al. *Faculty development. A resource for clinical teachers*. *J Gen Intern Med*. 1997;12(suppl 2):S56-63.
- [30]. Cole KA, Barker LR, Kolodner K, Williamson PR, Wright SM, Kern DE. *Faculty development in teaching skills: an intensive longitudinal model*. *Acad Med*. 79:469-80
- [31]. Elliot DL, Skeff KM, Stratos GA. *How do you get to the improvement of teaching? A longitudinal faculty development program for medical educators*. *Teach Learn Med*. 1999;11:52-7.
- [32]. Teherani A, Hitchcock MA, Nyquist JG. *Longitudinal outcomes of an executive-model program for faculty development*. *Acad Med*. 2001;76:S68-70.
- [33]. Gruppen LD, Frohna AZ, Anderson RM, Lowe KD. *Faculty development for educational leadership and scholarship*. *Acad Med*. 2003;78:137-41.
- [34]. Pololi LH, Knight SM, Dennis K, Frankel RM. *Helping medical school faculty realize their dreams: an innovative, collaborative mentoring program*. *Acad Med*. 2002;77:377-8
- [35]. McGaghie WC, Bogdewic S, Reid A, Arndt JE, Stritter FT, Frey JJ. *Outcomes of a faculty development fellowship in family medicine*. *Fam Med*. 1990;22:196-200.
- [36]. Marks MB. *Academic careers in medical education: perceptions of the effects of a faculty development program*. *Acad Med*. 1999;74:S72-4.
- [37]. Salerno SM, O'Malley PG, Pangaro LN, Wheeler GA, Moores LK, Jackson JL. *J Gen Intern Med*. 2002;17:779-87.

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