Quality Standards for Web-Based English Teaching in Engineering

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Abstract: - Setting standards in the evaluation of education reflects the community’s response to the call for reform in the teaching and learning process. The corpus of standards aims at creating a coherent vision on the curriculum and on the corresponding means and techniques of assessment, thus facilitating revision and improvement. This article focuses on the specific standards for e-learning in the field of foreign languages and on their impact upon the quality of web-based education. All standards have been articulated for evaluating both student performance and curricular programs, with an emphasis on the role of evaluative measures in gathering information on which engineering university teaching can base subsequent instruction.

Key-Words: - English e-learning in engineering, curriculum, evaluation, quality standards, impact on society

1 Introduction
A standard is a statement that can be used to judge the quality of what is taught, how it is taught, how well it is learnt and to what extent it can be quantified, therefore it represents an important part in ensuring teaching, learning and performance quality. Standards reflect, and are an extension of, society’s reaction to the demands of progress. As students need to learn more, and often differently, instruction must be significantly revised, by accepting increasing contributions from web-based platforms.

The aim is to complement, supplement, or even replace sectors of traditional teaching with e-learning, in order to create a coherent vision of what it means to be literate nowadays, both in a world that relies on calculators and computers to carry out procedures, and in a world where new developments are rapidly growing and are extensively being applied in diverse fields.

Therefore, education should elaborate and partially update the set of standards, valid not only for traditional learning, but also for web-based learning, able to guide the revision of the curriculum and its associated assessment process.

2 Problem Formulation
The key areas envisaged in developing new quality standards for web-based education include:

• The Curriculum, which is an operational plan for instruction that details what students need to know, how students are to achieve the identified curricular goals, what teachers are to do to help students develop their knowledge, and the context in which learning and teaching occur.

• Evaluation. Standards have been articulated for evaluating both student performance and curricular programs, with an emphasis on the role of evaluative measures in gathering information on which teachers can base subsequent instruction. The standards also acknowledge the value of gathering information about student growth and achievement for research and administrative purposes.

• Standards. A standard is a statement used to judge the quality of a curriculum or of evaluation methods, expressing what is valued.

In English language e-evaluations, as in all professional activities, many things can, and, often, do go wrong. Subject taboos, misinterpretations, and addressing the wrong questions may lead to providing erroneous information. Indeed, there have been strong accusations that evaluations, in general, have failed to provide worthy services. Clearly, web-based evaluation itself is subject to evaluation and quality assurance efforts. Around the world, professional educators must evaluate their work in order to obtain directions for improving it and document effectiveness. They must assess the performance of students, programs, personnel, and institutions. In various countries, such evaluations have occurred at many levels: student group, university, state or province, and national system. There have also been international comparisons of the quality of both traditional and web-based education. Evaluations have varied enormously: in point of objects assessed, questions addressed,
methods used, audiences served, funds spent, values invoked, and quality. During the past 30 years, there have been substantial efforts to assure and control the quality of e-evaluation. In addition to creating professional assessment bodies, developing preparation programs and a substantial professional literature, there have been concerted efforts to develop and enforce professional standards for web-based evaluation. Such different sets of standards are noteworthy, as they provide:

- operational definitions of student performance and program evaluation;
- evidence about how methods serve objectives in educational evaluation;
- general principles for dealing with problems;
- practical guidelines in planning evaluations;
- criteria for judging evaluation plans and reports;
- conceptual frameworks for studying evaluation;
- progress in professionalizing evaluation;
- content for evaluation training on various types of assessment.

2.1 Definition of standards for e-learning

In general, standards respond to four attributes of an evaluation: utility, feasibility, propriety, and accuracy. The utility standards reflect a general consensus that emerged in the educational evaluation literature, requiring program evaluations to respond to the information needs of their clients, and not merely to address the interests of the evaluators. The feasibility standards are consistent with the growing realization that evaluation procedures must be cost-effective and workable in real-world, politically charged settings. The propriety standards – particularly American – reflect ethical issues, constitutional concerns, and litigation on such matters as human rights, contracts, freedom of information, and conflict of interest. The accuracy standards judge the technical merit of information, especially validity, reliability, and objectivity. Overall, then, standards promote evaluations that are useful, feasible, ethical, and technically sound – thus significantly contributing to education improvement.

The term evaluation means a systematic investigation of the worth or merit of some object. The object of an evaluation is an educational program, a project, instructional materials, personnel qualifications and work, or student performance and needs. Standards are commonly accepted principles for determining evaluation value and quality.

An important feature of the standard-setting process is the breadth of perspectives that have been represented, since, by definition, a standard is a widely shared principle. The format common to all standards starts with a descriptor (for instance, formal obligation). The descriptor is followed by a statement (for example what is to be done, how, by whom, when). Then comes an overview, including a rationale for the standard and definitions of its key terms. Also included, for each standard, are lists of pertinent guidelines, pitfalls, and warnings. The guidelines are procedures that would often prove useful in meeting the standard, the pitfalls are common mistakes to be avoided, and the warnings discourage overzealous enforcement of the given standards. The presentation of each standard is concluded with an illustration of how it might be applied. The illustration includes a situation in which the standard is violated, and a discussion of corrective actions that would result in better adherence to the standard. Usually, illustrations are based on real situations, and they encompass a width of different types of evaluations.

In general, the Utility Standards are intended to guide evaluations so that they will be informative, timely, and influential. These standards require evaluators to acquaint themselves with their audiences, earn their confidence, ascertain the audiences’ information needs, gear evaluations to respond to these needs, and report the relevant information clearly and when it is needed. The standards in this category include: audience identification, evaluator credibility, information scope and selection, interpretation, report clarity, report dissemination, report punctuality, and evaluation impact. Overall, the Utility Standards are concerned with whether an evaluation serves the practical information needs of a given audience.

The Feasibility Standards say that, usually, evaluations must be conducted in a ‘natural’, as opposed to a ‘laboratory’ setting, and should not consume more materials, personnel, and time than necessary. The Feasibility Standards cover: practical procedures, political viability, and cost effectiveness. Overall, these standards call for evaluations to be realistic, prudent, diplomatic, and quick.

The Propriety Standards reflect the fact that evaluations affect many people in different ways. These standards are aimed at ensuring that the rights of persons affected by an evaluation will be protected. The Propriety Standards cover the following areas: formal obligation, conflict of interest, full and frank disclosure, public’s right to know, human rights, human interactions, balanced reporting, and fiscal responsibility. These standards require that those conducting evaluations learn about and abide by laws concerning such matters as privacy, freedom of information, and protection of
human subjects. The standards compel those who conduct evaluations to respect the rights of others and to live up to the highest principles and ideals of their professional reference groups. As a group, the Propriety Standards require that evaluations should be conducted legally, ethically, and with due regard to the welfare of those involved in the evaluation, as well as to those affected by the results.

Accuracy, the fourth group of standards, includes those standards that determine whether an evaluation has produced sound information. These standards require that the obtained information should be technically adequate and that conclusions should be logically linked to the data. The focus is on: object identification, context analysis, defensible information sources, described purposes and procedures, valid and reliable measurement, systematic data control, quantitative information analysis, qualitative information analysis, justified conclusions, and objective reporting.

2.2 Society’s need for standards

Historically there have been three reasons for groups to formally adopt a set of standards: to ensure quality, to indicate goals, and to promote change. All three are of equal importance.

First, standards are often used to ensure that the public is protected from faulty products emerging from web-based education. They focus on the control of how instruction and learning were produced and evidence of effectiveness. Standards in this sense are minimal criteria for quality. They set necessary, but not sufficient, conditions for generating the desired results.

Second, standards are often used as a means of expressing expectations about goals - which are broad statements of social intent. For example, we can agree that two goals for all tests are that they should be both valid and reliable.

Third, standards are often set to lead a group toward new desired goals. For example, professions have adopted and periodically updated standards for licensing specialists, based on changes in research, technology, etc. The purpose is to improve or update practices when necessary. In this sense, standards should be seen as criteria for excellence. They are based on an informed vision of what should be done, given current knowledge and experience.

Standards are needed in e-learning at university level for all three purposes. It seems reasonable that anyone developing products for student use should document how the materials are related to the current conceptions of what content is important to teach, and should present evidence about their effectiveness. Standards should, indeed, be viewed as facilitators of reform.

2.3 Social impact of e-learning standards

Calls for reform in engineering universities suggest that new goals are needed and the others re-examined. All industrialized countries experienced a shift from the industrial to the information society, a shift that has transformed both the aspects that need to be transmitted to students and the concepts and procedures they must master if they are to be self-fulfilled, productive citizens.

The Information Society. This social and economic shift can be attributed, at least in part, to the availability of low-cost calculators, computers and communication technologies. The use of technology has dramatically changed the nature of physical life, social sciences, business, industry and government. The relatively slow mechanical means of communication – the voice and the printed page – have been supplemented and even replaced by electronic communication, enabling information to be shared almost instantly with persons or machines anywhere. Information is the new capital and the new material, and communication is the new means of production. The impact of this technological shift is not an intellectual abstraction. It has become an economic reality. Today, the pace of economic change is being accelerated by continued innovation in communications and computer technology.

New Goals for Society. Schools, in their traditional form, are a product of the industrial age. In most democratic countries, common schools were created to provide youth with the necessary training to become workers in fields, factories, and shops. As a result, students were expected to become literate enough to be informed voters. Thus, minimum competence in reading, writing, and arithmetic was expected of all students, and more advanced academic training was reserved for the select few. The more advantaged students attended schools meant to educate the elite, the future cultural, academic, business, and government leaders.

The educational system of the industrial age no longer meets today’s economic needs. New social goals for education include:

1. widely literate workers (mathematics/computer/foreign languages),
2. lifelong learning,
3. opportunity for all,
4. an informed electorate.

Implicit in these goals is a university system organized to serve as an important resource for all citizens throughout their lives.
1. Widely literate workers. The economic status quo in which factory employees work the same jobs to produce the same goods in the same manner for decades is a relic from our industrial-age past. Today, economic survival and growth depend on new factories established to produce complex products and services with very short market cycles. It is everyday reality that before the first products are sold, new replacements are being designed for an ever-changing market. Concurrently, the research division is at work developing new ideas to feed to the design groups, in order to meet the continuous demand for new products that are, in turn, channelled into the production arena. Traditional notions of basic competence have been outstripped by ever-higher expectations of workers’ skills and knowledge; new methods of production require technologically competent work force. Employees must be prepared to understand the complex technologies of communication, to ask questions, to assimilate unfamiliar information, and to work cooperatively in teams. Businesses no longer seek workers with strong backs, clever hands, and basic arithmetic skills. In fact, the most significant growth in new jobs will be in fields requiring the most education. Here are some of the expectations for new employees in industry:

- The ability to set up problems with the appropriate operations
- Knowledge of a variety of techniques to approach and work on problems
- Understanding of the underlying features of a problem
- The ability to work with others on problems
- The ability to see the applicability of general ideas and various cultural traditions to common and complex problems
- Preparation for open problem situations, since most real problems are not well formulated
- Belief in the utility and value of cultivating communication skills

2. Lifelong learning. Employment counselors, aware of the rapid progress in technology and employment patterns, claim that, on average, workers will change jobs at least four or five times during the next twenty-five years, and that each job will require re-training, at least in the field of communication skills. This is best done, and with less expenses, via e-learning. It manages to make distance, age and schedule almost irrelevant. To this end, flexible workforce capable of lifelong learning is required; it implies that learning must cultivate a dynamic form of literacy. Problem solving – which includes the ways in which problems are represented, the meanings of the language and the ways in which one conjectures and reasons – must be central to schooling, so that students can explore, create, adjust to modified environments, and actively get new knowledge over the course of their lives.

3. Opportunity for all. Social injustice from past schooling practices can no longer be tolerated. Creating a just society in which women and various ethnic groups enjoy equal opportunities and equitable treatment is a must. Communication and computer skills become a critical filter for employment and full participation in our society. We cannot afford to have the majority of our population illiterate from these points of view. Thus, equity has become an economic necessity.

4. Informed electorate. In a democratic country in which political and social decisions involve increasingly complex technical issues, an educated, informed electorate is of critical importance. Current issues – such as environment protection, nuclear energy, defense policies, fund spending, space exploration, and taxation – involve many interrelated questions. Their thoughtful resolution requires technological knowledge and understanding. In particular, citizens must be able to read and interpret complex, and sometimes conflicting, information.

In brief, today’s society expects teaching to insure that all students have an opportunity to extend their learning, have an equal opportunity to get instruction and become informed citizens, capable of understanding the issues of the information society. As society changes, so must its universities, and its forms of learning should explore all avenues facilitated by scientific progress, moving from traditional frameworks to web-based platforms, where possible.

2.3 New goals for foreign language students in e-learning

Educational goals for students must reflect the importance of the above mentioned change. The standards articulate five general goals for foreign language students in web-based learning:

1. to learn to value various things,
2. to become confident in their abilities,
3. to solve problems,
4. to communicate
5. to reason.

These goals imply that students should be exposed to numerous and varied interrelated experiences that encourage them to value the enterprise, to develop habits of mind, and to
understand and appreciate the role of communication in human affairs; that they should be encouraged to explore, to guess, and even to make and correct errors, so that they gain confidence in their ability to solve complex problems; that they should read, write, and discuss issues; and that they should conjecture, test, and build arguments on the validity of certain conjectures.

The opportunity for all e-learning students to experience these components of training is at the heart of the vision on the quality program. The curriculum should be permeated with these goals and experiences so that they become commonplace in the lives of students. We are convinced that if students are exposed to the kinds of experiences outlined by the standards, they will gain more power in developing their potential. This would improve individual abilities to explore, conjecture, and reason logically, as well as the ability to use a variety of methods effectively to solve non-routine problems. This notion is based on the recognition of the fact that learning is more than a collection of concepts and skills to be mastered; it includes methods of investigating and reasoning, notions of context, and means of communication. In addition, it develops self-confidence for each individual.

Toward this end, foreign language web-based learning is seen as a place where interesting problems are regularly explored using important ideas. The premise is that what students learn depends to a great extent on how they have learnt it.

2.4 Teaching quality stems from appropriate standards observed in all web-based tests

The essential function of a web-based examination is to guarantee that all successful candidates have acquired and implemented a certain minimum of knowledge and ability. In determining standards, this minimum is defined by obtaining a number of points on a specific examination or test scale. However detailed the specifications and the syllabus may be, they can never equal the precision of an exam. Moreover, they will allow for different levels of difficulty. So, the main questions in designing tests for e-learning will be:

- How to determine the number of points necessary for a pass in a specific examination paper? The answer is: by means of setting standards
- How to ensure the same level of difficulty in all exams? The answer is: by maintaining standards.

In daily practice, it is common to consider half the questions plus one correct as sufficient for a pass. In this way, obtaining a pass will depend completely on the questions asked. If they are easy, a pass will be easy to obtain, but if they are difficult, fewer candidates will manage to pass. One way of avoiding this dependence on question difficulty in a particular examination is to determine beforehand exactly how difficult the examination should be and to establish this by pre-testing.

The percentage of scores needed for a pass and the degree of difficulty in an examination are usually largely determined by tradition. Only when a new type of examination is introduced will it be necessary to discuss them.

If one asks authorities about the minimum number of points a candidate should have to pass, the answers will differ widely. People who are less in contact with candidates, such as heads of schools, inspectors or civil servants, tend to have higher demands than those in closer contact with candidates, such as teachers and parents.

3 Problem Solution

3.1 Applicability

The Standards do not exclusively endorse one approach to evaluation. Instead, they encourage the sound use of a variety of evaluation methods.

They are frequently used in surveys, observations, document reviews, trials for projects, case studies, advocacy teams, testing programs, simulation studies, time-series studies, checklists, goal-free evaluations, secondary data analysis, and quasi-experimental design. In essence, evaluators are advised to use whatever methods are best suited for gathering information that is relevant to the questions posed by clients and other audiences, yet sufficient for assessing program effectiveness, costs, responses to societal needs, and worth.

It is desirable to employ multiple methods, qualitative as well as quantitative, and the methods should be feasible to use in the given setting.

Other types of evaluations to which the Standards apply include pilot studies, needs assessments, process evaluations, outcome studies, cost effectiveness studies, and meta-analyses.

In general, the Standards are intended for use with studies that are internal and external, small and large, informal and formal, and for those that are formative (designed to improve a program while it is still being developed) and summative (designed to support conclusions about the worth or merit of an object and to provide recommendations about whether it should be retained, revised, or
Standards represent a sound consensus of good evaluation practice. It would be a mistake to assume that standards are intended for application only in heavily funded and well-staffed evaluations.

The Standards must not be viewed as an academic exercise, but as a code by which to help improve evaluation practice. This message is as applicable to those educators who must evaluate their own work as it is to those who can call the services of evaluation specialists.

3.2 Difficulties

A particular difficulty in applying standards is that, inevitably, efforts to meet certain standards will detract from efforts to meet others, and trade-off decisions will be required. Such conflicts will vary across different types and sizes of studies, and within a given study the trade-off will probably be different depending on the stage of the study. Evaluators need to recognize and deal as judiciously as they can with such conflicts. If there is no prospect for utility, then, of course, there is no need to work out an elegant design that would produce sound information.

Once it is ascertained that a proposed evaluation could meet conditions of utility, feasibility, and propriety, then the evaluator and client would tend carefully to the accuracy standards.

There are also problems with trade-offs among the individual standards. All Supervising Committees decided against assigning a priority rating to each standard because trade-off issues vary from study to study and within a given study at different stages.

The Standards were useful, but not sufficient guides, in such applications as designing evaluations, assessing evaluation proposals, judging evaluation reports, and training evaluators.

There are criticisms as well:

- Crucial elements of certain standards lie outside the evaluator’s professional area of control.
- The Standards assume more flexibility in the choice of methods of assessment, than sometimes may exist in institutional settings.
- The Standards deal better with external evaluations than with internal, self-evaluations.
- The Standards need to be made more useful by ordering them in the same sequence as an evaluation typically unfolds, providing more specific guidelines and examples, and adding bibliographic references.

Some critics saw great possibilities for unhealthy collision between evaluators and sponsors and disagreed with the position reflected in the standards namely that evaluators should continuously communicate with their clients and report interim findings.

4 Conclusion

There is a difference between the skills and training inherent in these expectations and those acquired by students working independently to solve explicit sets of drill and practice exercises.

Although subjects are not taught in universities solely so students can get jobs, learning experiences must reflect the modern workplace. The broadly educated professionals will be a major factor in determining how businesses respond to today’s changing and challenging economic conditions.

The pervasive message is that all evaluators should strive to make their evaluations useful, feasible, proper, and accurate. Moreover, professional standards are most useful when developed by the professionals whose work is to be assessed.

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