Culture-Fair Assessment of Foreign Language Skills in Engineering Education

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Abstract: - The term *evaluation* (assessment) refers to careful, rigorous examinations of educational programs, curricula, institutions, organizational variables, or policies, with the primary purpose of learning about the particular entities under scrutiny: however, more general knowledge may also be obtained. The focus is either on understanding and improving the issues under assessment (formative evaluation), or on summarizing, describing, or judging planned and unplanned outcomes (summative evaluation). Evaluation pertains to the study of programs, practices, or materials that are ongoing or in current use. These may range in duration from an hour-long television program to a multi-year curriculum, and in scope from a program within a single school to one installed in a nationally representative sample of hundreds of schools. Evaluation is characterized by a plurality of methods and approaches. Most forms of assessment rely on content which is specific to a given culture or reflects the values of a particular societal group. A form of evaluation devised for use within one context cannot then be validly used to assess people from a different culture or system of values. Culture-fair tests seek to address this problem by providing means whereby people of diverse backgrounds can be assessed fairly and not suffer any disadvantage on account of their backgrounds.

Key-Words: - culture fair assessment, objectives in foreign language for engineering, tests, recognition policies

1 Introduction

Over the past two decades, evaluation has become well-established as a distinctive field of research and practice, and its potential to serve a range of purposes has been clarified. Consensus has been reached about key terms and distinctions, and clearly differentiated perspectives and approaches have emerged. Today, the field of evaluation has its own conferences, professional organizations, and journals, with an increasingly numerous group of professionals identifying themselves primarily as evaluators. Formal assessment of programs and policies is accepted as routine in science, technology, medicine and the allied health professions, in business, in social programs, and, perhaps, most of all, in education. The accumulated knowledge on evaluation theory & practice may be found scattered in journal articles, textbooks, review annuals, and innumerable evaluation reports, but to date there has been no single, ultimate source of information.

2 Problem formulation:culture fairness

The purpose of assessment is to obtain data on individuals' performance&abilities. It commonly implies discriminating between them. For instance, job selection procedures choose one candidate in a group and reject others. Therefore, in each case, discrimination relates only to the purposes in view. In general terms, an assessment procedure is fair if it discriminates on relevant grounds and avoids the irrelevant, by reference to the targets to be attained. It is culture fair if the criteria encompass a comprehensive range of cultural factors. Both negative and positive aspects are important. The negative side of culture-fair assessment is the requirement that gross cultural factors such as place of birth or ethnic group membership be ignored as sources of differentiation. This is on the assumption that such factors are irrelevant to the action and decisions to be taken on basis of the assessment. The positive and more problematic, aspect is the need to take account of relevant differences deriving from the cultural background. If a particular group of students had diminished learning opportunities or was socialized to regard school negatively, it affects any future work they engage in, and it must result in educational programs for them.

2.1 Models of culture fairness in assessment

Culture fairness, as notion, proved difficult to translate into operational terms, and many psychometric models were produced to specify culture-fair selection in point of meaning and practical implications.

Three models will be briefly described here. First, the regression model, or Cleary's model, sees test fairness in terms of efficient prediction. If a test is used to choose among different applicants, it must select the one with the highest predicted performance. When developing a test it is necessary to set relevant standards of performance serving as criteria and demonstrate that the new test predicts well to them, e.g. one criterion in an academic aptitude test is performance on a subsequent examination. If the test is satisfactory, then high scorers will do well on the examination, and low scorers will not. If there are clear-cut groups with different average levels of performance on the criteria, such as whites & blacks in the US, predictions must be carried out separately. It may appear to be just a technical point, but it is of great practical significance, as prediction is done via regression analysis, and unless separate regression equations are used for different subpopulations, a high-scoring subgroup is, in general, discriminated against, by under-prediction. In the present example, American whites would be placed at a disadvantage.

Thorndike proposed a constant ratio model, which focuses on the proportions of applicants selected from different subgroups, in particular on any discrepancy between their respective mean performances on the test and on criteria. In general, different cut-off scores are required for the different groups.They are related to the fraction of the groups that reach a specified level of criterion performance.

Cole formulated another model, *the conditional probability*, which focuses on those applicants who would succeed if selected, and gives all an equal chance, regardless of group membership. It is worth noting that this model requires lower cut-off scores for *minority* groups than the Thorndike model.

These various models differ from each other because of the notions of fairness they incorporate. The regression model, for example, sees fairness in terms of efficient prediction. It avoids discriminating on irrelevant grounds but it takes little account of the positive aspects of culture fairness. Efficient prediction does not require one to take account of factors which may hamper present performance. In fact, it may be hampered by seeking to do so; if the reasons why present performance is low are not diagnosed, present performance may well be a good predictor of future performance (since unidentified problems are unlikely to be solved). If, however, an assessment procedure seeks to identify possible limitations on present performance levels and takes them into account,this will be recognized as a fairer procedure. The constant ratio model sees fairness in terms of the selection of comparable numbers from different subgroups. This does not ignore potentially relevant differences in the same way, but the effort to be culture fair is crude.The model is often applied to ethnic groups:if the proportion of white/black people in the population is 70/30,then a fair assessment procedure will produce 7 white people for every 3black people. This is fairness of a sort, but it assumes that being white/black is a crucial variable. In practice there are many variables which are more relevant to the assessment outcome than ethnic group membership.

2.2 Achieving culture fairness

In practice, culture fairness in assessment can only be achieved by considering evaluation contexts. Assessment objectives must be clearly identified and related to the discrimination capacities of whatever assessment procedure is in use. Thus many different procedures can be used as long as the relationship objectives/discrimination is clearly analyzed. More direct ways of achieving culture fairness consist in constructing tests with culture fairness specifically in mind, such as learning ability tests.Hegarty&Gredler reviewed the main efforts to design them, while other culture-reduced tests for groups/individuals were reviewed by Jensen. These tests embody many different approaches, but they are underdeveloped.

2.3 Stating culture-fair objectives in foreign language engineering education

The approach must start with any documentation already available for the lesson/ unit/course, such as descriptions/standards/desired results.Then audience, behavior, condition and degree are added. A learning objective is clear when the 4 parts are put together.
- Audience: whom the objective is applied to
- Behavior: what the observable result is
- Condition:special context for attaining the target
- Degree: student's score to be considered proficient

Foreign language competences can be written by building their structure on Bloom's taxonomy, from the lowest to the highest level, in the cognitive, psychomotor and affective domains. Each one must introduce skills, knowledge and behaviors necessary for successful completion and for being ready for the next level of courses/success in a chosen career.

Each individual competence is specific to the attribute being described. It should start with an action verb followed by an object, such as, *analyze local, regional, national, or global problems or challenges*. Competences are performance based and measurable. The action verb for each competence is very important (e.g. *analyze* from the analysis level of the Cognitive Domain in Bloom's taxonomy). If the seminar is basic, the competency writer might choose a word from a lower level, such as *recognize*.

A lecture emphasizing higher order thinking skills might use a verb from a higher level, such as *justify*. The essence is deciding whether the competence will describe behaviors(affective domain), skills (psycho-motor domain) or knowledge (cognitive domain) and whether it will be lower or higher level. Then the list of verbs for Bloom's taxonomy can provide a starting point for writing the sentence.

2.4 Psycholinguistic approaches

In psycholinguistics, Chomsky's theory and, in particular, his criticism of Skinner's verbal behavior marked the beginning of the mentalist or cognitive approach. The concept of competence (as opposed to performance) widened the scope of analysis far beyond manifest behavior, and nowadays Titone's glossodynamic model was added to this conceptual framework, in order to take into account speakers' willingness and intention to communicate, their attitudes towards language in general and towards each code/culture/style/register. In education, the concepts of curriculum and of mastery learning (among others) have added new dimensions to lecture planning; in this perspective, defining goals& objectives is of increased relevance. Last, but most important of all, there has been constant evolution in teaching methods, from the audio-lingual/aural-oral approaches to present-day communicative designs.

One of the basic functions of objectives is to clarify short-term aims, indirectly impacting upon more precise formulations of desired goals, target levels of proficiency, and evaluation criteria. In Mager's words, "with clear objectives in view, the student knows which activities on his part are relevant to his success, and it is no longer necessary for him to refer to the instructor ... considerable time and effort are frequently spent by students in learning the idiosyncrasies of their teachers; and, unfortunately, this knowledge is often very useful" in that moment, but not in perspective. Accordingly, if discussing the communicative syllabus, educators should not forget the essential aspect of professor/student interaction and dialogue. The decisional process is an itinerary proceeding from the system of values and the analysis of the teaching situation, to the definition of general goals, and from these to more specific objectives. There is one essential remark on higher values and educational goals: specific foreign language objectives for engineering students do not depend on the analysis of the teaching situation only, but also on ideas and principles about the full development of learners' personality in all its dimensions (spiritual, social, physical). As a tool for the analysis of the didactic

situation, a sociolinguistic survey is probably even more important than a good entry test, because the latter guides on what to teach, whereas the former gives a precise understanding of whom to teach.

Considering how foreign language and culture acquisition are interpreted, perceived and implemented in the new, global work environment, Valette & Disick developed a considerably different set of taxonomies, specifically related to modern language acquisition.There, for instance, mechanical skills are the first step in their subject-matter taxonomy (a classification that is entirely cognitive).

The variety of approaches and solutions clearly shows at least two things: first of all, since all the sciences connected with foreign language teaching are subject to constant development, evaluation of behavioral objectives is bound to undergo frequent reassessment; secondly, in this field, it is difficult to devise all-purpose classifications and programming procedures, and, even if it were possible, one could seriously question whether it would be advisable.

One suggestion often given by experts is that professors should always try to set objectives above the lowest rank in the hierarchy. By doing this, the tendency to focus learning on theoretical notions exclusively can be counteracted. A question emerges: what objectives are consistent with the communicative approach? In Valette-Disick taxono-my, communication is level 4 (out of 5): "using the foreign language and culture as natural vehicles" obviously calls for a high standard of competence and performance in both receptive and productive skills. When teaching beginners or mixed ability groups it is often impossible to set immediate high-level objectives, so it is perfectly legitimate to develop intermediate objectives pertaining to lower levels (transfer/knowledge/simple mechanical skills) provided that educators make sure there is basic coherence between these intermediate steps and both the general and final objectives.

3 Problem Solution

Although attention to education has always tended to fluctuate depending on the political climate, we have now reached a critical time for the education reform wherein the future of our country's global economic success, national security, and quality of life will be a direct result of education decisions that are made today. There are both challenges and critical opportunities for change and modernization in education. In perspective, they will provide the students with global competences and skills for the 21st century. Due to the increasingly global nature of today's economy and job market

and the technological advancements of global interconnection, it is more important than ever that foreign language education should play a significant role in the development of 21st century skills at all levels of instruction, together with science, technology, engineering, and mathematics. Foreign language and intercultural communication skills are paramount for today's students in their successful careers, therefore numerous policy strategies were proposed in order to advance foreign language proficiency outcomes among all students, provide national coordination of language programs at all levels, and implement systemic solutions to make such proficiency outcomes a reality.

3.1 The need for coordination

A national framework and a coordinated system for foreign language education at high school level must be implemented,observing EU reference framework for foreign languages and the linguistic passport requirements, so that, when students come to engineering universities, they should be able to focus more extensively on specialized vocabulary and patterns of technical documentations.

3.2 The need for systemic solutions for increased & prolonged language study with high levels of proficiency

• Reaffirm the importance of foreign languages as core subject area, acknowledging that they appear in lower positions on the core subjects list and standards in academic subjects.

• Create and implement a national framework for articulated & sequenced language programs, starting at elementary level and continuing progressively through higher education, employing the national foreign language standards in valid and reliable assessments to measure proficiency outcomes.

• Encourage content-based language instruction and immersion education, starting in elementary school and continuing through the baccalaureate and/or professional levels, including overseas study, to increase the number of college graduates with professional proficiency in two or more languages with attention to major world languages.

• Recognize the importance and benefits of early instruction in commonly taught languages as a foundation for students to gain competence in one world language and acquire language learning skills that provide later opportunities for study of less commonly taught and more difficult idioms.

• Increase/reinvest available funds for articulated foreign language programs and increase grant funding opportunities to assist universities with the startup costs associated with new, innovative, and/or significantly improved language programs.

3.3 The need for targeted research on foreign language education in engineering

Funding must also be given to targeted research on issues, such as best practices (including, e.g. class size/time on task/use of target language), methodology/assessment techniques/teacher preparation/the domestic and global effects of second language competence, that have been identified by language professionals as important in increasing production and efficiency in language acquisition.

3.4 Culture-free Tests

Culture-free tests are independent of cultural context and scores on them should not in any measure reflect access to specific cultural experience, knowledge, or values. Culture-free tests should not be confused with culture-fair tests. A continuum can be imagined from tests which are highly specific to given situations and relevant only in these situations to tests which are wholly non-specific in this way. Tests which come toward the latter end of the continuum are culture reduced, and more likely to be culture fair, but it is only in the limit that they could be styled culture free.

3.5 Relationship to Culture-Fair Assessment

Conventional tests comprise items which are never quite void of cultural content or reference. *How many centimeters in a meter?* is less culture specific than *What is the capital of Scotland?* All make some cultural reference,however, and imply contexts outside which they are meaningless. Since scores on such tests reflect the degree of familiarity with the contexts,they should not be described as culture free, but rather culture reduced or culture fair,as adequate.

3.6 The Politics of Recognition

Finally, this approach turns to the difficult and complex issue of what has been called *tolerance*, *empathy*, or,from a political perspective, *recognition* of other cultures. Individuals need to be recognized both in their individual and in their social group identity. Sometimes these two demands might be incompatible. As individuals, they deserve the same respect and human rights protection given to all individuals by the laws of a democratic society; but as members of a cultural group they deserve to be given special rights and recognition. In other words, 'I want you to recognize me as the same as you, but at the same time I want you to recognize how different I am from you'. Simply put: should one

recognize sameness or separateness? The struggle for recognition, expressed here as 'we are equal but different', seems to be based on an assumption of equal worth, where 'I' or 'you' can be 'we' because we share a tight common purpose and can work towards the common good. But a common purpose and a common definition of what is good preclude any differentiation of roles and world views. Both the universal and the particular are abstractions that refer to more fundamental realities of unequal power, authority, and legitimation. What is needed, then, is not inauthentic judgment on the equal value or on the relative worth of different cultures, but a willingness to accept that our horizons might be displaced as we attempt to understand the other. We should not confuse bureaucratic and self-ascribed cultural identity, and we should not presume that the cultural categories we use in judging the worth of other cultures are universal.

Given the recent large-scale migrations around the world, this is a difficult issue that people and their representing politicians face in almost each industrialized society. National governments that promote multicultural, multiracial harmony, in fact enhance ethnic separateness by constantly drawing attention to 'racial' and 'ethnic' identities. Such distinctions may be enhanced by religion. These distinctions might also be strengthened by the educational system, where a decentralized school system, financed mainly by local taxes, ensures the perpetuation in schools of the local social class structure and local ethnic and racial distribution.

In modern urban communities where the individual cannot rely on predefined social scripts, nor on universally or nationally accepted moral principles, to find his/her cultural self, cultural identities are seen as being formed in open dialogue with others. Communicative practices reflect institutionalized networks of relationships, defined by the family, the school, the workplace, the professional organization, the church, each with its own power hierarchy, its expected role and status, its characteristic values and beliefs, attitudes and ideologies. This could be as far as we may go in defining the boundaries of one's cultural identity. Geographic mobility and professional changes may give a person multiple social identities that all get played out alternately on the complex framings and re-framings of daily encounters.

4   Conclusion

The relationship between language & culture in language study is one of the most hotly debated issues nowadays. Since language is closely related to the way we think and to the way we behave, and influences the behavior of others, the notion that our sense of social reality may be but a construction of language or a *language game*, is disturbing. The notion that a person's social and cultural identity may not be the immuable monolithic entity it is usually taken for, but a kaleidoscope of various presentations and representations of self through language, is unsettling. These uncertainties explain, in part,the current debates surrounding the role of native speakers, the concept of cultural authenticity, the notions of multicultural communication and what is known as *the politics of recognition*.

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