



PISA ASSESSMENT: THE PROBLEMATIC ISSUE OF ADMINISTRATING PISA SCIENCE LITERACY SURVEY TO ULTRA-ORTHODOX PUPILS IN ISRAEL, 2006

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Abstract. The aim of the present article is to point out the problematic issue of administrating PISA science literacy exam to the ultra-orthodox schools in Israel. It has been assumed that some texts included in the test may offend the feelings of the ultra-orthodox population or may contradict Orthodox upbringing and therefore constitute a cultural bias.

Key words: Assessment, PISA, cultural bias, ultra-orthodox schools.

PISA Assessment

The Program for International Student Assessment (PISA) is an internationally standardized assessment developed by the OECD in order to examine skills that students have acquired as they near the end of mandatory schooling.

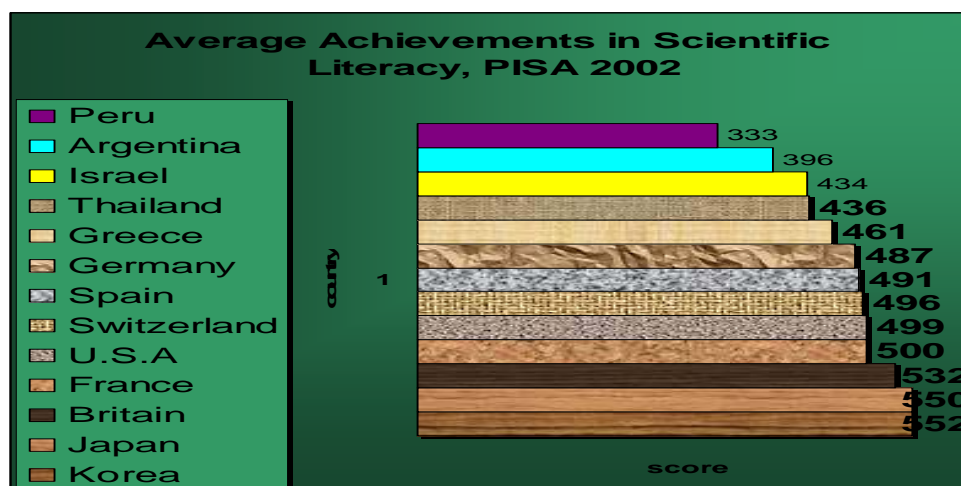
PISA is a paper-and-pencil exam that is designed to assess 15-year-olds' capabilities in reading, mathematics, and science literacy. Each student takes a two-hour assessment. Assessment items include a combination of multiple-choice and open-ended questions that require students to come up with their own response. PISA scores are reported on a scale with a mean score of 500 and a standard deviation of 100. Tests are typically administered to between 4,500 and 10,000 students in each country.

The PISA assessment was implemented in 43 countries in the first assessment in 2000, in 41 countries in the second assessment in 2003 and at least 58 countries in the third assessment during 2006. Since the year 2000, over 70 countries and economies have participated in PISA. Compatibly, PISA 2000 focused on reading literacy and PISA 2003 focused on mathematics literacy. However, PISA 2006 focuses on science literacy.

PISA assesses scientific literacy in three dimensions: scientific concepts, scientific processes & scientific situations (http://www.pisa.gc.ca/science_e.shtm).

PISA was introduced in Israel in 2002, two years after it was administered elsewhere, with somewhat disastrous results: Israel was ranked 33rd among 41 participating countries: In reading comprehension, Israel ranked 30th. The category was led by Finland, Canada and New Zealand. In mathematics, Israel ranked 31st, with Hong Kong, Japan and South Korea taking top marks. In the sciences, Israel ranked even lower, in 33rd place. The top marks went to South Korea, Japan and Hong- Kong.

Only students from Latin American countries, Bulgaria and Albania received consistently lower marks than Israeli students in the international survey (Literacy skills for the world of tomorrow, Unesco Unit of Statistics, 2003).



Picture 1: Average achievements in Scientific Literacy, PISA, 2002

The aim of this research has been to point out the problematic issue of administrating PISA science literacy survey to the ultra-orthodox schools in Israel: It is assumed that some texts may offend the feelings of the ultra-orthodox population or may contradict Orthodox upbringing and therefore constitute, to some extent, a cultural bias.

Cultural bias

Cultural bias is the phenomenon of unraveling and judging event by standards, norms, and conventions inherent to one's own culture. When people of a culture make assumptions based upon their own upbringing, then they can mistake these assumptions for laws of logic or nature.

Historically, the research on cultural bias in teaching and learning can be traced back to the research of Lev Vygotsky (1978) and Alexander Luria (1976). Both psychologists approach fused "cultural", "historical", and "instrumental" psychology and is most commonly referred to presently as cultural-historical psychology. It emphasized both the mediatory role of culture, particularly language, in the development of higher mental functions and the cultural bias inherent in evaluators' critique of young children's problem-solving strategies.

Cultural bias in teaching is evidenced within various academic curricula, especially in humanities and social sciences. Much of the learning chapters throughout those subjects are prepared by members of the majority as well as used to reinforce the hegemonic status of this group (Baker, 2005; Loewen, 2007). For example, the recent complain addressed to the Israeli education system is that the Holocaust is a vastly Ashkenazi symbol. Nevertheless, the Holocaust, as it is memorialized and studied, under-references the Jews in Northern Africa. Their history is indeed largely ignored, with maps, memorials, presentations and other teaching materials and listings of victims largely limited to Europe. Lists detailing Jewish losses typically aim to present a comprehensive picture of the losses of the Jews of Europe as a direct result of Nazi persecution while Non-Europeans Jews are absent from most.

Some researchers (Watkins-Lewis, & Kizzie, 2006; Tyler, Boykin, & Walton, 2006) claim that for many ethnic minority pupils, school-studies are actually conflicting to the cultural-laden learning experiences outside the classroom.

Consequentially, it is particularly difficult to develop an objective test let alone a test that measures innate intelligence without introducing cultural bias. Many college students have a middle-class background and may have difficulty appreciating the biases that are part of standardized intelligence tests, since their own background support the line of common tests. In order to prove this point tests have been developed for Blacks and for the Chicano culture and the Redden-Simons Rap Test (1986). The Redden-Simons "Rap" Test is a 50-item, multiple-choice test of vocabulary items typical of

"street language" in 1986, Iowa. On the short version of the Redden-Simons "Rap" test (12-items), "street" individuals averaged eight correct items, and college students averaged only two correct items. Using "street" norms, middle-class background students failed the test.

Methodology

The methodology we applied in our study is content analysis; a series of procedures is used in analyzing the text aimed at arriving at significant diagnoses and generalizations from within the text (Weber, 1985). Compared to other tools of measurement, this method has 3 major advantages: it is not invasive; contrary to other techniques such as interviews, responding to questionnaires, and projection tests, it is free of errors in data analysis stemming from the respondents' awareness of the examiner's presence and expectations.

Content analysis is able of dealing with puzzling data; while in techniques such as interviews and questionnaires the data is obtained in a structured manner so that every category being investigated is known beforehand, in content analysis the analyst may not be able to predict all the categories before conducting a preliminary check of the text.

Context analysis is context sensitive; the interpretation of the data in the process of content analysis is supposed to follow the processes occurring in reality, including political processes; it is a technique that is able to deal with a large amount of data such as data culled from textbooks (Krippendorff, 2004).

The analysis of texts can be carried out by using three primary methods: a) an analysis of qualitative content, b) an analysis of quantitative content, and c) a combination of both (Gull, 1981). Qualitative content analysis is based on understanding the content and the commentary that goes with it. This method gives a description of and comments about the principles and the values characterizing the description of events in the text. Depending largely on the analyst's intuition, the method, and the resulting evaluation cannot be expected to be objective. In contrast, quantitative content analysis is an objective and systematic method describing quantitatively clear messages. A distinction can be made between space analysis and frequency analysis; when doing space analysis, the analyst can point to the amount of space given to a certain event by counting the number of pages or lines in the text; the quantities are reported either in absolute numbers or relatively to other subjects. In frequency analysis, the analyst reports the number of times that a concept, a subject or idea are mentioned in a certain part of the story.

The third method is a blend of qualitative and quantitative analyses; in other words, it combines the systematic drawing of valid conclusions derived from a text, and is based not only on the understanding and interpretation of the researcher (naturalistic generalization), but also on numbering outstanding and recurring components in the text itself. In order to classify the utterances and the ideas in texts into unequivocal and independent categories, the method requires a detailed system of criteria. To balance the disadvantages of qualitative analysis, many passages are quoted from the text being evaluated; the purpose of the quotations is to enable the researcher to reach a high level of precision in reporting the content (Weber, 1990).

The extent to which the qualitative and quantitative methods are blended depends on the views and inclinations of the researcher; in the present study we will use a synthesis of both with emphasis on qualitative analysis.

The corpus: The sample has comprised texts (67) taken from the PISA science literacy preparation in Israel (1st & 2nd files, Published by the Academic Secretary, Ministry of Education, an experimental issue, Jerusalem, 2006).

Results

It has been found that 9 texts (13.4%) have included problematic issues that may constitute a problem to ultra-orthodox pupils.

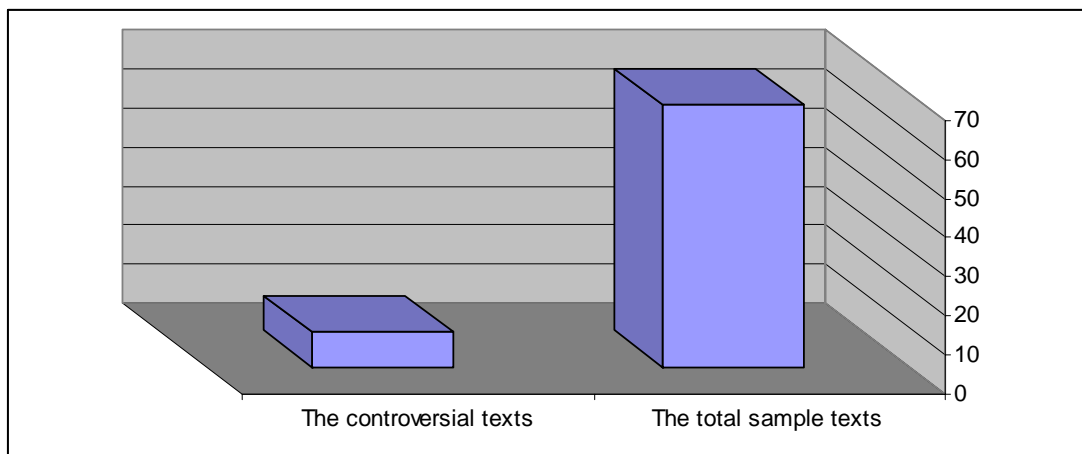


Figure 2 : The total sample texts and the controversial texts of PISA research corpus

The controversial issues found in the research:

Issues that contradict specific Jewish commandment (1text: "*About stars and people"). Interpreting mystical stars phenomena contradicts the prohibition of star worship, which is regarded in Jewish scripts as heathenism and paganism.

Issues that contradict biblical versions of the creation of the world (2 texts: "Alfred Wegner" & " Geological Linguistics").

Issues that may seem as intervention in the Devine order (5 texts: "Genetically modified plants"," Vitro fertilization", "Choosing the sex of the baby", "Cloned cells" & " Perpetum Mobile").

Issues that contradict the Jewish calendar (1text: "*Powers and Cranes").The text includes dates according to the Christian counting of years: Anno Domini.

Discussion & Conclusions:

The presentation points out the problematic issue of administrating PISA science literacy survey to the ultra-orthodox schools in Israel. No doubt that the texts mentioned above may contradict biblical traditions or even constitute a "deaf point" in understanding due to the ultra-orthodox socialization. Bias is presented when a test score has meanings or implications for a relevant, definable subgroup of examinees that are different from the meanings or implications for different examinees.

The research has shown that PISA test may be at risk to be biased from social values, religious beliefs and diverse standpoints. Hence, the concern relates to denial of prospects to do well on the test. Bias in item selection is presented when the items and tasks selected are based on the learning experiences and language of the dominant group, hence, the secular one.

One can argue that Social bias indeed influences validity; when a test is shown to measure different hypothetical constructs or grasps for one group than another, it certainly impairs the validity of a test. According to PISA site (2012) the administrators do follow the potentials of cultural bias of immigrants. It has been stated that governments and schools can help students from immigrant backgrounds to overcome some of the disadvantages associated with that background. Often, students with migrant background are socio-economically disadvantaged. On average across OECD countries, the parents of these students are less educated and work in lower-status occupations than their native peers. In addition, these students tend to have access to fewer educational and material resources at home than their native peers.

On average across OECD countries, the gap is reduced from 43 to 27 score points when comparing students of similar socio-economics status, regardless of whether they are from immigrant backgrounds or are native to the country in which they were tested. But the fact that a performance

gap equivalent to well over half a school year persists, even after accounting for socio-economic status, implies that other factors also have an impact on student performance.

Another significant concept relevant to the discussion of culture bias is fairness. It can be argued that while a test might not be biased technically, it can still bring about unfairness (Cole & Zieky, 2001). Test fairness is fundamentally about the social consequences of test results. Test fairness is the extent to which the social consequences of test usage are considered fair or unfair to relevant subgroups; test fairness is especially important to consider when used for selection, placement and even rating conclusions. If a test negatively affects a certain group then it has a incongruent impact. Bearing in mind that most male students of that sector do not continue studying secular subject-matters by the age of 12, administrating Pisa test in this sector may constitute a cultural bias as well as distort the overall achievement results of Israel. Moreover, Less than half of schools for ultra religious Jewish children teach English, literature, Hebrew language or Hebrew grammar. The survey, carried out by the Central Bureau of Statistics for the Ministry of Education, found that only 38.5 percent of ultra-Orthodox high schools and post-secondary institutions teach English. Only 40% teach Literature, Hebrew Language and Hebrew grammar (these four subjects together form the core curriculum). Mathematics is only taught at 41.3% of high schools and post-secondary institutions, while only 30% of ultra-Orthodox schools teach Civics and Geography. Since the paragraphs of PISA, assessment is primarily based upon two main dimensions, namely reading comprehension and worldwide education, one can clearly learn about the disadvantage of the ultra – orthodox pupils.

Nowadays, a growing number of educators call for a broader range of assessments, including alternative evaluation that can assess higher order skills. It seems as if the current state of standardized testing, nationally and internationally, still fails to assess learning readiness or capacity for academic inquests. Alternative assessments which take into account performance-based tasks can provide a more revealing picture of a students' true competence. Although alternative assessments present reliability challenges, an evaluation of a widened sampling of student work can be used to supplement traditional standardized test even like PISA.

References

- [1] Baker, P. B. (2005). The impact of cultural biases on African American students' education: A review of research literature regarding race-based schooling. *Education and Urban Society*, 37(3), 243–256.
- [2] Boykin, A. W., Tyler, K. M., & Miller, O. A. (2005). In search of cultural themes and their expressions in the dynamics of classroom life, *Urban Education*, 40(5), 521–549.
- [3] Boykin, A. W., Tyler, K. M., Watkins-Lewis, K. M., & Kizzie, K. (2006). Culture in the sanctioned classroom practices of elementary school teachers serving low-income African American students, *Journal of Education of Students Placed At-Risk*, 11(2), 161–173.
- [4] Cole, N. S., & Zieky, M. J. (2001). The new faces of fairness, *Journal of Educational Measurement*, 38(4), 369–382.
- [5] Gull, M.D. (1981). *Handbook for Selecting and Evaluating Curriculum Materials*, Boston, MA: Allyn & Bacon.
- [6] Krippendorff, K. (2004). *Content analysis – An Introduction to its Methodology* (2nd Ed.) Thousand Oaks, CA: Sage.
- [7] Loewen, J. W. (2007). *Lies my teacher told me: Everything your American history textbook got wrong*. New York: Simon & Schuster.
- [8] Luria, A. R. (1973). *The Working Brain*. Basic Books
- [9] PISA In Focus (2012). <http://www.pisa.oecd.org/dataoecd/53/18/49264831.pdf> (last retrived, February, 2012).
- [10] Redden, P. M., & Simons, J. A. (1986). *Manual for the Redden-Simons "Rap" Test*. Ankeny, IO: Des Moines Area Community College

- [11] Tyler, K. M., Boykin, A. W., Miller, O. A., & Hurley, E. A. (2006). Cultural values in the home and school experiences of low-income African American students. *Social Psychology of Education, 9*, 363–380.
- [12] Tyler, K. M., Boykin, A. W., & Walton, T. R. (2006). Cultural considerations in teachers' perceptions of student classroom behavior and achievement. *Teaching and Teacher Education, 22*, 998–1005.
- [13] Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.), Cambridge, MA: Harvard University Press.
- [14] Weber, R. P. (1990). *Basic content analysis*, Beverly Hills, CA: Sage.

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