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**»Training Needs Analysis in Economic Teaching.  
A Pilot study on the suitability  
of the Test of Economic Literacy (TEL)«**

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**Prof. Dr. habil. Volker Bank**

Chair of Vocationomics (Berufs- und Wirtschaftspädagogik)  
Technische Universität Chemnitz  
Reichenhainer Str. 41  
09126 Chemnitz

volker.bank@phil.tu-chemnitz.de

**Prof. Dr. habil. Thomas Retzmann**

Chair of Economics and Economic Education  
Universität Duisburg-Essen, Essen Campus  
Universitätsstraße 12  
45141 Essen

Thomas.Retzmann@uni-due.de

## *Abstract*

Economic literacy is a central topic in everybody's life, and, the more, in young peoples' vocational and professional orientation. Thus economic education is of great importance both to general and vocational education. Any sort of teaching, and, with this, economic teaching requires highly skilled and well informed teachers. For this reason, in a dynamic world not only the academic studies but also further teacher training has acquired a pivotal role in the quality management of both general and vocational schools.

Given the limitation of resources in time and money, a training needs analysis (TNA) of the already active staff is advisable before starting further education. A TNA may well be important to a purposive reinforcement of already given strong points, aiming at the accentuation of a given profile of a school or a teacher. A TNA may be equally important to equalise remaining weaknesses. However, it seems to be appropriate to respect the aspect of voluntariness, which is an important trait of further education. Teachers should be in a position to decide upon in which domain of economics they would like to reinforce their knowledge or their abilities. This freedom implies, that suitable diagnostic instruments are at hand. The instruments should enable teachers to evaluate themselves.

A pilot study on the economic literacy of teachers in economic education was carried out and evaluated in 2008 – 2010 by the universities of Chemnitz (Chair of Vocationomics) and Duisburg-Essen (Chair of Economics Education). It was aiming at finding out about the suitability of the German version of the Test of Economic Literacy (TEL) on testing the knowledge of economics teachers in lower secondary classes. Nevertheless, instead of developing a new test right from the beginning, it seemed appropriate to make use of the TEL in an adapted German version. Given the interest of designing a self-evaluation tool, the pilot study primarily aimed at finding out about the suitability of the items of the TEL for teacher evaluation. Together with this, an analysis of a number of traits of the different participant groups in respect of the diverging results at solving the test became possible.

The appropriateness to teachers of lower secondary teaching of the TEL could be proved in many items. A number of items, however, was substantially lacking discriminative power. In total, it could be shown that the TEL needs to be revised on the given purpose. It does not give a reliable image of the expert teachers. The test requires an extension to further domains, and a recalibration in the given domains for the examination of teachers. Further on, together with this it needs to get adapted to self-evaluation.

**Training Needs Analysis in Economic Teaching.  
A Pilot study on the suitability of the Test of Economic Literacy (TEL)**

*Volker Bank and Thomas Retzmann*

- 1 Improvement of teaching economics:  
a challenge of growing importance in general and vocational education
  - 1.1 *Teaching economics: a task of general and vocational education*
  - 1.2 *Further teacher training and training needs analysis (TNA)*
- 2 Methodology: Application of the TEL/ WBT to teachers
  - 2.1 *The Test of Economic Literacy (TEL) and its German adaptation (WBT)*
  - 2.2 *The pilot study*
- 3 Results: The TEL/ WBT and its suitability for TNA

Economic and financial literacy are of the central topics in everybody's life, and, the more, in vocational and professional orientation of adolescents. The importance of economic and financial education is more and more acknowledged. Instruction in economic education requires highly skilled and well informed teaching staff. For this, further teacher training has acquired a pivotal role in the quality management of schools (Bank & Schaal 2011). However, this requires specific training, a training which replies to the specific needs of the individual teacher. Resources in time and money are limited, so a training needs analysis (TNA) of the teaching staff is necessary. This short paper presents a study on options and limits of (self-)evaluation of a standardised test, in this case the Test of Economic Literacy (TEL).

## **1 Improvement of teaching economics: a challenge of growing importance in general and vocational education**

### *1.1 Teaching economics: a task of general and vocational education*

Knowledge in economics and economical behaviour subsequently has received increasing acknowledgement in the past decades. It is considered to be crucial in every day's life. Along with the dominance of neo-classical theory of economics, the implied model of the *homo economicus* may even have been over-estimated since the times of Thatcherism and Reaganomics. Nevertheless, economics, finance, business and household administration are not only topics of general education but also make important contributions to vocational education: No craftsman is able to run a business without fundamental financial knowledge, no worker will understand that the wages are not only a given date, fixed by people that hold the power, no adolescent facing the need of earning his or her life has the capacity of making a rational choice of his or her future job, vocation, or profession. Another important point: the outcomes of learning and instruction at lower secondary level determine the individual input of

vocational education and training – and thus a lot of its quality. The better the students get instructed in the topics of economics, finance, and administration at lower secondary schools, the higher the possible level of instruction at vocational college can be, not to mention the increased rationality in vocational or professional choice.

Along with Niklas Luhmann (1984) economy can be described as an important social sub-system. Though it remains one societal sub-system among others, it has played nothing like the pivotal role in education as the sub-system of economics plays in a globalised world. Thus appears quite evident that its role in the field of education needs to be improved, particularly in the domain of general education. In this domain economic, financial and administrative education have received weak consideration in the design of the curricula, which are traditionally dominated by mathematics and science, by dead and living languages, by history and geography. Improvements, however, can not only be achieved by organisation and curriculum development but it must be achieved by the personnel development of the teaching staff. Even after a successful ending of initial teacher education, this sooner or later will ask for further teacher training.

## *1.2 Further teacher training and training needs analysis (TNA)*

Improvements in instructional competence can be pursued by purposively reinforcing strong points which are already given, aiming at the accentuation of an existing profile of a school or a teacher. Contrarily to this positive model of strength, there is the deficit model of further teacher training: In many cases it may appear even more important to equalise remaining weaknesses. However, a central trait of further education is its voluntary basis. People should not be forced into additional training or even stigmatised by participating. In order to give full respect to this, teachers should be in a position to decide upon in which domain they would like to reinforce their economic knowledge or their abilities. This freedom implies that suitable diagnostic instruments need to be provided. The instruments should enable teachers to evaluate themselves and to draw appropriate consequences from the results obtained.

However, an appropriate testing needs to be valid, reliable and easy to use. There are only a few standardised tests in the domain of economics, finance, and business administration. One of these tests, the Test of Economic Literacy, once developed by Soper 1978 and improved by Soper & Walstead in 1987, has been translated into German and then been re-validated by Beck & Krumm in 1998 (Wirtschaftskundlicher-Bildungs-Test, WBT).

The study presented in this paper has chosen the German version as a starting point. For its strict control of answering time, in its present form the TEL can hardly be used as an instrument of self-evaluation. Anyhow, it rather appears to be a technical problem of software implementation. The question of evaluation vs. self-evaluation must be the last to be solved, so it has not been taken into consideration in this study. The primordial question is the suitability of the test as a tool of TNA: The TEL had been designed as a standardised tool for the evaluation of students at lower secondary level. This is the main reason for the non-representative exploratory design of this study. The testing has been tried out with teachers of lower secondary schools. If suitable for the purpose of TNA at all, the test could be used in TNA for teachers in higher secondary schooling at vocational colleges, too. More or less as a by-product, the study has provided an analysis of a number of traits of the different participant groups in respect of the diverging results.

## **2 Methodology: Application of the TEL/ WBT to teachers**

### *2.1 The Test of Economic Literacy (TEL) and its German adaptation (WBT)*

The TEL examines at all levels of the taxonomy of cognitive goals (Bloom 1956) except for level 5 (synthesis). The contents of the test are (1) basics of general economics, (2) microeconomics, (3) macroeconomics, and (4) international affairs. In detail, it checks for knowledge on scarcity, opportunity cost, productivity, economic systems, institutions, trade, money, markets, prices, offer and demand, competition, income distribution, growth (international and domestic), employment, inflation, economic policy, exchange rates, and trade obstacles. It is presented in two different forms (A and B) which are supposed to be equivalent. This can be controlled by the use of anchor-items which are identical in the two forms.

The test is lacking, however, any item on the knowledge of accountancy, business administration, or finance, nothing to say of anything concerning private households or even business ethics. Nevertheless, instead of developing a new test right from the beginning, it seemed justified to make use of the TEL in its German version. This validated version needed to get adapted to the latest developments in some details (items A/B 26, 31, 35, 44; A 30; B 28, 32). For instance, many national currencies have disappeared and have been replaced by the Euro. Another example is the use of the GDP (gross domestic product) instead of the GNP (gross national product) as the main indicator for economic growth in official German statistics. Of course, the sample of the study was too small to check the validity of the reformulated items, but by external validity this is not only a neutral but a necessary change: Teachers' knowledge ought to be at the peak of the latest developments: A teacher still arguing with the German Mark or the GNP would have significant training needs.

### *2.2 The pilot study*

This pilot study on economic education of teachers of economics was carried out and evaluated in 2008 - 2010 by the universities of Chemnitz (Chair of Vocationomics) and Duisburg-Essen (Chair of Economic Education). It was aimed at finding out about the suitability of the TEL on testing the knowledge of economic teachers in lower secondary classes. The test was applied to 176 candidates.

The testing was carried out in three sample regions. For practical reasons these were the regions of Western Saxony (Chemnitz), of Westphalia (Essen/ Münster), and of Holstein (some of the team members being allocated to the University of Kiel). Whereas the split between Saxony and Westphalia was intended for methodical reasons, Saxony being located in the east of the Federal Republic of Germany and thus in the area of former GDR, Westphalia in an old industrial western region. Since participation was voluntary, it proved to be extremely difficult to generate sufficient participation in the western region, despite incentives offered for participation and strict confidentiality. The incentives were a free training in instructional methods in economic education and an evaluation of one's own profile in economic literacy. The western part of the sample was subsequently completed by participants from the northernmost part of Germany. In the end, the minimum quotas required both in the western and the eastern regions finally were overly fulfilled; in Saxony in most participating schools all relevant teachers were tested. The testing took place within the schools, in order to minimise the cost of participation to the volunteers. The time needed was around one hour, mostly determined by the standardised design of the test.

The use of the TEL was augmented by a demographic information questionnaire, asking for the sort of studies previously pursued: no teacher in economics had undergone specific

studies, because the topic had previously been scattered throughout a number of different other subjects, especially geography. Not every member state of the Federal Republic has got sufficient capacities at universities (if any) to provide enough teachers for instruction in economics to the schools. The hypothesis connected to this variable was to expect better results for those teachers who had undergone specific studies in economics and in business administration. The geographical locus of the school was the next variable (east-west), and routinely gender variables together with age variables another one. As the schooling system in Germany is vertically stratified, this was a variable to be considered; it was expected to get better results from the teachers employed at those schools with a higher level of performance. The independent variable was the score of the TEL.

In order to explain some of the differences in testing results, the mean values were tested by two-tailed t-tests in case of dichotomy. In case of variables of ordinal scale values, single-factorial variance analysis was applied. In case of unequal sample sizes a Welch test, wherever necessary a Kruskal-Wallis test was computed.

### **3 Results: The TEL/ WBT and its suitability for TNA**

Given a theoretical maximum of 50 points the scores went from 16 to 46 with an average of 32,2 points. It cannot be rejected that the scores follow a normal distribution (as tested by Kolmogorov-Smirnov,  $\alpha=.05$ ). An analysis of the distractors showed insufficient results in 10 items of form A and no lesser than 18 items of form B. The forms do not produce fully equivalent results with the teachers, the scores in form A being higher than those in form B (only for  $\alpha=.01$ ). A discriminant analysis shows a good value for the extremely difficult items, whereas the more simple items appear to be too simple at the level of teachers; they do not indicate differences between 'good' and 'bad' performers.

The central result of the study is that the TEL would need a thorough revision before more than some of the items can be used on the specific purpose of TNA. Its four domains (basics, micro, macro, international) are too broadly defined to give precise hints at individual strengths and weaknesses. There is hardly any explanation that participants scored lower in the domain of 'basics' as compared to the domain of 'microeconomics'. In both forms, the domain of 'international affairs' is the part with the lowest scores.

All in all, the appropriateness of the TEL to the testing of teachers of lower secondary teaching could be shown in many items. The TEL in its present state can be used for TNA, however, it must be clear that it does neither give a reliable nor a clear image of the expertise of teachers now. A re-calibration in the given domains for the examination of teachers is necessary. The more, an extension to the domains of finance and administration is needed. Finally, an adaptation to the needs of self-evaluation would have to follow.

Furthermore, the testing gave way to some interesting observations. The co-variations with the demographic specifics of the sample produced some interesting results that were a little bit more than a by-product. On the specific traits that have been investigated ( $\alpha=.05$  unless indicated), there were significant discriminances only in a few variables. Among the tested persons the male achieved higher scores ( $\mu_m=33.95$ ,  $\mu_f=30.41$ ,  $\sigma=5.80$ ). Different to the expectations, there is no significant divergence between three cohorts of age. The mean scores of participants from Saxony (east), from Westphalia (west) and from Holstein (north) respectively are  $\mu_s=30.34$ ,  $\mu_w=34.12$ , and  $\mu_h=32.48$ . The hypothesis of indifference must be rejected for teachers from Saxony and Westphalia ( $\alpha=.01$ ), whereas no further difference can be confirmed.

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