Chapter 81

Quantifying Education Quality in Secondary Schools

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ABSTRACT

This research assesses the important factors in assuring education quality in secondary schools by using a business intelligence approach. A Business intelligence framework is created by employing a business intelligence process to identify the stakeholders and components relevant to education quality. The resulting Education Quality Indicator (EQI) framework consists of seven Critical Success Factors and is measured through twenty-eight Key Performance Indicators. The EQI framework is evaluated through expert interviews and a survey, and demonstrates that the most important factor in assuring education quality is a teacher's ability to communicate with students. Finally, a feasibility analysis is conducted in the environment of an information system that is implemented for secondary schools in the Netherlands.

1. INTRODUCTION

Even though many research works have been conducted to assess quality in education, there is no standard on how to measure quality of education (Becket & Brookes, 2005). In the Netherlands, there exists a protocol for measuring education quality in schools, which is conducted by the Education Inspectorate by investigating various aspects that affect the education process. However, this inspection is conducted on a yearly basis. This means that the measurement of a school's strategy can only be done on a yearly basis, which is not ideal for schools as they cannot see whether their operational activities are conducted towards the right direction. Our research aims to provide a 'traffic light' which warns when school activities are not going toward the desired goal. This is done by employing a business intelligence framework and process model to help schools direct their policy. We aim to answer the following research question: 'how can a business intelligence process be developed to assess the quality of education in secondary schools?'

2. RESEARCH METHODS

This research follows the Design Science research model by Hevner, March, Park, & Ram (2004) to create a framework that encompasses all the important components and stakeholders of the education process. As a first step of this research, a literature study is conducted in both the topic of education quality and business intelligence. In addition, we review the Dutch education system as this will be the exemplary environment for our research. Next, a semi-structured interview method (Longhurst, 2010; DiCicco & Crabtree, 2006) is employed to gather data from experts in the field of education. The interviewees involved in this research include policy advisors of a school group, quality assurance personnel of a school group, independent researchers on education management and quality, and one founder of an education quality assessment organization. After conducting interviews, we develop our initial framework, which is then validated through a questionnaire survey to secondary school directors in the Netherlands. The questionnaires handed out in this research are online and aimed for school directors of the different level of secondary schools in the Netherlands.

3. THEORY

3.1. The Dutch Education System

In the Netherlands, the education system is divided into three parts: primary, secondary, and tertiary education, as shown in Figure 1 (Scheerens, Luyten, & Ravens, 2011; Dutch Eurydice Unit, 2007). The focus of this research is on secondary education, which starts at the age of twelve. After finishing primary education, students will enter one of the three types of secondary education, namely VMBO (pre-vocational secondary education), HAVO (senior general secondary education), and VWO (pre-university education). Pupils move after primary education to one of the type of schools described above on the basis of their achievement levels within primary education (Scheerens et al., 2011).

VMBO (*Voorbereidend Middelbaar Beroepsonderwijs*) or pre-vocational secondary education combines vocational training with theoretical education in languages, mathematics, history, arts, and sciences. VMBO lasts for four years and has four different levels, based on the combination portion of practical vocational training and theoretical education (School Choice International, 2008) which students should choose at the end of the second year for the continuation after *basisvorming*. The different levels are:

1. *Theoretische Leerweg* (VMBO-t), or theoretical learning path, is the most theoretical program of the pre-vocational education.
2. *Kaderberoepsgerichte Leerweg* (VMBO-k), or middle management-oriented learning path, is a middle-management program which teaches theory and vocational education equally.
3. *Gemengde Leerweg* (VMBO-g), or combined learning path, is a mixed program whose focus is between the theoretical and the middle management-oriented paths. In practice, the existence of this learning path is very small as not many schools with this path exist.
4. *Basisberoepsgerichte Leerweg* (VMBO-b), or basic profession-oriented learning path, equips and prepares students for vocational training in the higher level of education.

HAVO or *Hoger Algemeen Voortgezet Onderwijs* which literally means senior general secondary education is the secondary education which is intended to prepare students for professional

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