

Effective civic education
Testing an educational effectiveness model for explaining
students' achievement in civic and citizenship education

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Abstract

The intended study aims at testing a causal model for “effective civic education” based on the Comprehensive Model of Educational Effectiveness developed by Creemers (1994) in relation with secondary school students’ achievement in civic and citizenship education in 22 countries participating in the IEA Civic and Citizenship Study (CIVED). It is assumed that secondary analysis of international comparative studies in civic and citizenship education can provide a valuable opportunity to test and develop integrated multilevel educational effectiveness models in relation to different outcomes of learning than the ones that were usually investigated, namely civic and citizenship achievement. This secondary analysis makes use of the information gathered via questionnaires from students, headmasters and cognitive tests in order to determine how much of the variation in students civic achievement can be explained by variables located at different levels (student, classroom/school, country) and if individual variables from different levels show the expected results on students civic achievement. Multilevel analysis was employed to recognize the multilevel influences on students’ civic achievement that the model assumes. The results of this study partially generated empirical support for the validity of Creemers’ for outcomes in civic and citizenship education and shed a light on the importance of investigating country effects.

1. Introduction

Advances in educational effectiveness research have revealed that the influences on student achievement are multilevel and that relevant variables for predicting students’ outcomes are located at individual student level, the level of classroom teaching, the level of school organization and the contextual level. The studies conducted in this line of research provided support for integrated multilevel educational effectiveness models (Teddle & Reynolds, 2000). An important achievement in the educational effectiveness research was the development of comprehensive educational models (Creemers, Scheerens & Reynolds, 2000). These are causal models for educational attainment that contain explanatory variables at different levels and are based on the assumption that higher levels provide conditions for factors at lower level (Kyriakides, 2006). One of the most influential models is the one developed by Creemers (1994). In this model the school level and the context level influence indirectly educational outcomes by influencing the classroom level (Creemers, 1994). Several studies provided empirical support for the main assumptions of the model for different types of learning outcomes and it is considered a generic model of educational effectiveness (Creemers & Kyriakides, 2007, Kyriakides, 2006). However, the model was mostly tested in relation with cognitive outcomes in domains as mathematics and reading and rarely has taken into account outcomes related with other goals of education (Kyriakides, 2005) while only one study was conducted on a international sample and provided some support for the importance of the context level (Kyriakides, 2006).

That is why is argued that the educational effectiveness research should make use more often of these theoretical models as it is also thought that international studies are needed to show contextual differences between countries with respect to what works in education (Creemers, 2006; Kyriakides, 2006). Therefore, conducting secondary analysis of international studies is regarded as a gain for the theoretical development educational effectiveness research and also as an opportunity to look at international studies from a comprehensive theoretical perspective.

International studies can provide the opportunity for looking at factors associated with other outcomes of education while being able to address contextual differences between countries with respect to different criteria of educational effectiveness.

Among these criteria for effectiveness are the ones associated with civic and citizenship education. Civic and citizenship education has become the centre of a major debate and review over the past decade while becoming one of the major goals of educational policies across the world (Birzea, 2003). Responding to the generalized need for reformation in the field, international studies were conducted in order to gather information concerning the improvement of civic knowledge within and across countries (Birzea, 2003; Torney-Purta, Lehmann, Oswald & Schulz, 2001). Among them, a very important contribution was made by the 1999 IEA Civic and Citizenship Study (CIVED). Overall, the studies based on CIVED data investigated differences between countries on outcomes related to civic education for pupils in secondary education. Findings from these studies point at different aspects of students' personal and social background, of the teaching and learning in the classroom, of school organization and the educational systems which are related with students' achievement in citizenship (Schultz, 2002; Torney-Purta et al., 2001). Most of the factors related to civic achievement that were identified are in line with the findings of educational effectiveness research. Even if the analyses conducted to explore the influences of different predictors on students civic knowledge rarely addressed the multilevel nature of this factors (Schultz, 2002), researchers in this field acknowledge the importance of differentiating between the specific influences of different contexts in which citizenship education takes place (Schultz, 2007; Torney-Purta et al.,2001).

The insights given by research in citizenship can be related with the educational effectiveness line of research by integrating them into comprehensive educational models, extensively grounded in research, that are generally relevant for students' outcomes like the Comprehensive Model of Educational Effectiveness (Creemers, 1994). Further, in this paper it is argued that it is possible to specify a model in which predictors of students' civic achievement found significant in previous research on civic education are identified or added within the framework of the Comprehensive Model of Educational Effectiveness.

1.2. Theoretical background

The Comprehensive Model of Educational Effectiveness

The Comprehensive Model of Educational Effectiveness was developed by Creemers (1994) based on Carrol's model of school learning. The model was build by making use of educational and learning theories as well as by selecting factors that influence achievement based on established empirical findings from educational effectiveness research. Next to that the model recognizes that the influences on student achievement are multilevel, therefore the factors selected were defined at different levels of education: the student, classroom, school and context (educational system) levels. The main goal was to provide a comprehensive overview of factors at different levels that influence student achievement. At each level, factors are related with tree main concepts in educational effectiveness: quality, time for learning and opportunity to learn.

[Insert Fig.1 here]

The model (Fig.1) assumes that students' achievement is influenced by students' social background, intelligence, motivation and by the time they actually spend learning and the way in which they use the opportunities to learn. The factors at student level are influenced by the time for learning and opportunity to learn provided at classroom level as well as by the quality of instruction. Creemers (1994) argues that the classroom level is the most important for creating conditions for effectiveness. The concepts (quality, time, opportunity) at classroom level are influenced by the same concepts situated at the higher levels on school and national contexts. Therefore, the influences of the context and school level factors on student achievement are

mediated by the classroom factors, the factors at higher levels being conditional for those on lower levels. It is claimed that student achievement is a result of the influences of factors located at different levels of the educational system and the model claims to be generally explanatory for at types of outcomes and different subjects.

Several studies (De Jong, Westerhof, & Kruiter, 2004; Driessen & Sleegers, 2000; Kyriakides, 2005; Kyriakides, Campbell, & Gagatsis, 2000; Kyriakides & Tsangaridou, 2004; Kyriakides, 2006; Reezigt, Guldemond, & Creemers, 1999) were conducted in order to provide information on the validity of the model. Most of them could not fully cover important variables or levels in the model and the criterion for achievement used was mostly mathematics and reading performance. The studies confronted often with the problem of operationalising adequately the concepts in the model, sometimes with the problem of not being able to disentangle between classroom and school effects, and with the exception of one study (Kyriakides, 2006) they did not investigate the effects of the context level.

However, the research provided support for the model in The Netherlands (De Jong et al., 2004; Driessen & Sleegers, 2000) and Cyprus (Kyriakides, 2005; Kyriakides et al., 2000; Kyriakides & Tsangaridou, 2004) as well as internationally (Kyriakides, 2006). Among the main findings it has been shown that the influences on student achievement are multilevel and that the main variables in Creemers' model (quality, time, opportunity) were related to students' achievements in the cognitive, and sometimes (Kyriakides & Tsangaridou, 2004; Kyriakides, 2005) affective, and psychomotor objectives of schooling. The findings show support for the relevance of the model for other outcomes of schooling and provides reasons for further research in this area. Next to showing support for the main principles advocated by the model the studies also indicate that most variance in achievement explained is located at student level. However, some of the student level variance remains unexplained (De Jong et al., 2004; Kyriakides et al., 2000) which makes space for other explanatory factors at student level. A particular interesting finding for the aim of this study was that in a secondary analysis of TIMSS 1999 dataset, Kyriakides (2006) found that the country effect was more important than the teacher effect. This finding provides an important reason for further analyses of international studies in order to identify the effects of factors at the national level upon student achievement. Overall, it was claimed that the model could be considered a generic model of educational effectiveness (Creemers & Kyriakides, 2007).

1.2.2. Findings from international studies in Civic and citizenship education

Some international studies were conducted to investigate differences between countries on outcomes related to civic education for pupils in secondary education and tried to identify factors that are influencing students' civic achievement. An extensive source of findings and secondary analysis was provided by 1999 IEA Civic and Citizenship Study (CIVED). CIVED investigated differences between a number of twenty-eight countries on outcomes related to civic education for pupils in secondary education (Torney-Purta et al., 2001). One of the most important outcomes of civic education that was investigated was civic knowledge. Civic knowledge is advocated to be important cognitive component of citizenship (Kirlin, 2003) which should also lead to skills in interpreting political communication and dispositions favoring actual involvement in conventional citizenship behavior.

The findings of the 1999 IEA Civic and Citizenship Study as well as the ones from the secondary analyses that the study made possible, lead to identifying a set of variables that are positively related to students' civic achievement. Most of the predictors can be identified in the framework of the Comprehensive Model of Educational Effectiveness. However, the studies did not make use of comprehensive theories on learning and with some exceptions (Schultz, 2002; Torney-Purta, Richardson & Barber, 2005) did not address the multilevel nature of the influences

Effective civic education. Testing an educational effectiveness model for explaining students' 4

achievement in civic and citizenship education. M.M.Isac, M.P.C. van der Werf

on civic achievement. Moreover, the effect of the context level was not taken into account in none of the studies.

The analysis of these studies from an educational effectiveness perspective lead to the identification of a set of predictors located at the individual student level and the level of the school (which overlaps with the one of the classroom). In what follows an account of these factors is given.

A first group of factors that significantly relate with student civic achievement are individual student characteristics. In this respect, several studies found that gender has a significant influence on civic knowledge. Both IEA Civic Studies (1971 and 1999) identified a significant influence of gender on test performance (Torney-Purta et al, 2001). These findings reflect also results from earlier international studies on citizenship (NAEP 1988) as well as outcomes of secondary analyses of the IEA Civic education study (Schultz, 2002). The 1999 IEA study (Torney-Purta et al, 2001) also identified that after controlling for other factors boys have slightly higher scores than girls.

Another set of relevant variables are the ones related to the home environment of the student. Among these, the home literacy resources that students possess seems to be an indicator for higher-level performance in civic education (Schultz, 2002). It seems that the more books students report having at home, the higher their level of civic knowledge (Schultz, 2002; Torney-Purta et al, 2001).

In addition, a positive predictor of performance in civics seems to be students' expected further education. This variable can be regarded as an indicator of students' general ability and motivation and proved to be a strong predictor of knowledge in both IEA civic education studies (Torney-Purta et al, 2001) as well as in the study of Schultz (2002).

Most studies on civic education give special attention to school-related variables while emphasizing the important role that schools play in developing civically knowledgeable students. Due to the sampling procedures in IEA international studies different factors that are distinctly associated with classroom and school level are treated often as located at school level.

Most variables identified in this category have positive effects on students' civic knowledge. For example, taking classes in which civic topics are studied as well as the quantity of social studies instruction has a significant positive impact on the levels of students' civic achievement (Niemi and Junn, 1998; Homana, Barber, & Torney-Purta, 2006). If the previous set of variables refers to the quantity of civic instruction, other predictors refer to its quality. Researches in citizenship often refer to an "open classroom climate". This variable reflects students' perceptions of an open classroom climate for discussions and it was proven to be a strong predictor of knowledge in several studies (Campbell, 2005; Homana, Barber & Torney-Purta, 2006; Niemi and Junn, 1998; Torney-Purta et al, 2001; Schultz, 2002). Next to these findings, in some studies, the impact of teachers' educational experience and confidence in teaching civic-related classes on students' performance was investigated. Torney-Purta et al., (2005) showed that teachers' educational experience and confidence to teach is positively related with students' achievement in civics.

As it can be seen, most of these factors are similar to some of the ones identified by educational effectiveness research. Investigating the impact that these variables have on students' civic achievement together with other predictors recognized by research in a comprehensive theoretical model can give important insights on what counts for civic education and how different levels of the educational system contribute to this outcome.

1.2.3. Aim of the study

The intended study aims at testing a causal model for "effective civic education" based on the Comprehensive Model of Educational Effectiveness developed by Creemers (1994) in

Effective civic education. Testing an educational effectiveness model for explaining students' achievement in civic and citizenship education. M.M.Isac, M.P.C. van der Werf 5

relation with secondary students' achievement in civic and citizenship education in the countries participating in the IEA Civic and Citizenship Study (CIVED).

In line with the assumptions of Creemers' model, the study intends to answer the following research questions:

1. How much of the variation in students civic achievement can be explained by variables at different levels specified in the model?
2. Do the individual and classroom/school level factors in the model show the expected effects on students' knowledge in civic education?

2. Methodology

2.1 General design and data sources

The data that is used for this study comes from the 1999 IEA study (CIVED). The data from the international sample for the "standard population" will be used (Schultz & Sibberns, 2004). The population investigated is students in the grade where most 14-year-olds were found at the time of testing. The sample for only 22 countries from 28 is investigated due to restrictions related to the availability of information required for this study. The countries are the following: Australia, Belgium (French), Bulgaria, Chile, Colombia, Cyprus, Czech, England, Estonia, Finland, Greece, Hong Kong (SAR), Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovak Republic, Slovenia, Sweden. Within each country, only one classroom was sampled from each selected school so it is not possible to disentangle school from classroom effects (Schultz, 2002).

The outcome variable of interest is civic knowledge, measured via a cognitive test. It includes two sub-domains: content knowledge and skills in interpreting political communication (Schultz & Sibberns, 2004).

The information on the other variables in the model comes from CIVED student and school questionnaires. For purpose of this analysis, variables from CIVED that are associated with civic knowledge are identified and related with the educational effectiveness model. This is done by considering the variables in Creemers' model and the available information in CIVED dataset.

According to the main principles of the model, variables are identified within categories as context, time, opportunity and quality factors and can be organized in three levels (student, school/classroom and country level) to recognize the multilevel influences on students' civic achievement that the model assumes. A summary of identified variables is presented in what follows.

2.2. Explanatory variables within IEA Civic Education Study (CIVED):

Outcome variable

The total IRT scores (content knowledge + skills) on 38 multiple-choice items for civic achievement were used. The variable was normalized to a mean of 400 and a standard deviation of 20 for all countries considered in the analysis.

Explanatory variables at student level

- Student background factors. Indicators of student background are gender (girls = 1; Boys = 0) and home literacy resources (number of books at home). Home literacy resources can be regarded as a proxy indicator for the socio-economic status of the student

Effective civic education. Testing an educational effectiveness model for explaining students' achievement in civic and citizenship education. M.M.Isac, M.P.C. van der Werf 6

(Schultz, 2002). The following categories will be used: 0 = “none of very few books” 1 = “11 to 50 books”, 2 = “51 to 100 books”, 3 = “101 to 200 books” and 4 = “more than 200 books”.

- Expectations. Years of expected education refers to how many years of further education students expect after the current year (Schultz, 2002). It can be regarded as an indicator of students’ general ability and motivation to improve his knowledge. Students’ responses for this variable range from 0 to 6 indicating none to more than ten years of expected education.
- Proficiency in reading. Creemers model assumes that general ability or prior achievement must be taken into consideration. Due to unavailability of this information in CIVED, students’ proficiency in reading will be taken into account. Students that reported speaking the language of the test at home never or sometimes are coded 1 while students that are using it always are coded 0. It is assumed that this variable is an indicator of reading problems that can have a negative impact on students’ performance on the civic knowledge test.
- Time factors. Time on task at student level is difficult to assess, therefore a proxy for this variable is used, namely students’ reports about how often they spend evenings outside of their families with their friends. The following categories will be used: 0 = “Never or almost never”, 1 = “A few times each month”, 2 = “1-3 times a week” and 3 = “Almost every day”. Students with high scores on this variable may tend to neglect their study (Schultz, 2002).
- Opportunity factors. Information on the amount of time spent doing homework was not available in CIVED. However, due to the unique feature of civic education of being a result of activities both within and outside school it is assumed that the opportunities that students have to discuss political issues with their parents as well as their exposure to TV news that contain political information are relevant factors for student’s success.

Explanatory variables at school (classroom) level.

- Contextual factors. Variables related to the context of the school as percentage of girls, average home literacy and average years of expected education are measured. These are aggregated from the student-level data.
- Quality of instruction is one of the main factors that account for students’ learning in Creemers model. The variables measured in CIVED cannot offer the entire information located at this level as prescribed by the model so indicators of quality of instruction will be poorly covered. However, there are indications on teachers’ behaviour that facilitates an “open classroom climate”. This variable (average Cronbach $\alpha = 0.77$) reflects students’ perceptions of an open classroom climate for discussions and it was proven to be a strong predictor of civic knowledge in several studies (Homana et al., 2006; Niemi and Junn, 1998; Torney-Purta et al, 2001; Schultz, 2002). The scores for this variable at school level are aggregated from the student-level data. The quality of instruction can also be measured by factors indicating the existence of a school evaluation policy as well as a policy on teacher professionalization. An aspect of the school evaluation policy is the extent in which parents are involved in the school life by making sure that the child completes the homework (0 = never; 1 = sometimes; 2 = often). In what teacher professionalization is concerned, the availability of teachers that cover civic-related subjects (0 = yes; 1= no) is relevant for the aim of this investigation.
- Time factors. Actual time spent on teaching civic-related subjects was not measured in CIVED. An indicator for this factor can be found in the school questionnaire and refers to

the amount of time (hours) per week which students are required to spend on taking classes in civic-related subjects (history, social sciences, law and economics). The three variables are measured using four categories as none as, less than one hour, one to two hours and more than three hours. An index was created by adding the scores on these variables to represent the time that the school requires to be spent on civic-related topic.

- Opportunity to learn. This factor in Creemers' model is usually tested as the amount of homework that students usually undertake for a certain topic. However, the subject of civic and citizenship education has specific features being reflected not only in specific subjects but as well in the entire curricular and extra-curricular experiences that the school provides. That is why the opportunities that the school offers to students to learn and practice civic-related behaviours has a higher relevance for this topic. Students' perceptions of the opportunities they have in school to learn to understand persons, to cooperate, to contribute to solve problems, to be patriotic and loyal, to protect the environment, to be concerned about other countries and to learn about the importance of voting were considered as indicators for this factor. A scale (average Cronbach $\alpha = 0.73$) was created from seven items containing the above mentioned information, to reflect the opportunities that students perceive as offered by school. Scores were aggregated to school level.

Explanatory variables at the country level

Unfortunately CIVED does not provide information on variables related to quality and opportunities that educational systems offer. Therefore, the variables investigated at this level represent the context for learning and the time for learning.

- Context. Contextual factors at the country level concern the percentage of girls, average home literacy and expected years of further education indicators. These variables were aggregated from the student-level data.
- Time factors. In order to investigate the country effect, time factors concerning average amount of time per week which students are required to spend on taking classes in civic-related subjects are measured. This variable is aggregated from school level data and indicates the amount of time that is spent in a country for civic-related topics.

2.3. Analysis strategy

Creemers model is tested on CIVED data emerged from the international sample for 22 countries. The model assumes that the influences on students' civic achievement are multilevel. Therefore, due to the nested structure of the data, multilevel analysis (Snijders & Bosker, 1999) was performed. Because in the IEA civic education study one classroom was sampled from each school, the classroom level coincides with the school level. As a result, three levels were distinguished: student, classroom/school and country level. A model with the specified levels was estimated and in subsequent steps, explanatory variables at different levels were added starting with student level.

Because factors tested in this model showed positive effects in previous educational effectiveness and civic education research, each factor in the model is expected to positively influence student civic achievement. It is possible that groups of factors are related to some extent and therefore there is the possibility to take each others' effects away (Reezigt et al., 1999). Therefore, non-significant effects of individual factors do not contradict the model. Only a significant effect that is opposite to what is expected will be considered as contradicting the model.

First an empty model was estimated. Next to that, the student level variables were introduced in the model in order to test for their effect on students' performance on the civic knowledge test. Further on, the variables at school level were introduced followed by the variables at country level.

Given the enormous sample sizes both at student and school level, a significance level of 0.001 was employed. For the analysis at the level of the country, which included only 22 countries, a significant level of 0.05 was employed.

The fixed effects in the model were tested by using t-ratio coefficients. In this respect and absolute t-value should be greater than 1.96 with a p-value less than 0.001 or 0.05 in order to consider a significant effect of a variable. For the random part, the deviance test was used (Snijders & Bosker, 1999).

Prior to performing the main analysis, an issue to be dealt with was handling missing data. Because multilevel analysis requires complete data-sets, two procedures were employed. First, all missing scores on the outcome variable were removed from the dataset. They represented less than 1% for every country included in the analysis. Second there were missing values on explanatory variables at student level as gender, home literacy resources, expected further education, speaking language of the test at home, evenings spent outside home, political discussions with parents and watching TV news. Also some scores were missing on variables at school level as parents making sure that their child completes homework and the availability of teachers covering civic-related topics. For the student level variables the percentages of unavailable cases were between 0.5% and 7.4% and for the school level variables from 7.4% to 9.4%. The missing data on the student variables was imputed by replacing them with the school/classroom mean and on the school variables with the country mean. Missing data dummy variables were created to indicate if a substitution has been made (1) or the original score was used (0). These variables were later included in the model as predictors to check if the imputation had changed the effect of each predictor.

3. Finding and Discussion

The analysis intends to test the Comprehensive Model of Educational Effectiveness and to identify if the main variables in the model, situated at different levels, have a significant effect on student performance for the civic knowledge test.

The specification of the model starts with the empty model, with three levels and one dependent variable (civic knowledge). In subsequent steps, explanatory variables at each of the three levels were added, starting at the student level. The models are presented in Table 1.

[Insert Table.1 here]

The first model shown in Table 1 is the empty model which presents the variance at student, school and country levels without explanatory variables. What is interesting is that the variance at country level is estimated at 0%.

In model 1, the context variables at student level as well as indicators of time for learning and opportunities used were included in the empty model. Together these variables determine high reduction in the unexplained variance and a decrease in deviance of 9780.4, value significant at $p < 0.001$ and 7 degrees of freedom. Student level variables explain 17% of the total variance. The effects of the contextual factors namely gender, number of books at home, years of expected further education and speaking the language of the test at home were all statistically significant at $p < 0.001$. The effects of these contextual variables on student civic knowledge are the expected ones. The model was improved by adding gender and it was found that girls tend to achieve lower

Effective civic education. Testing an educational effectiveness model for explaining students' 9

achievement in civic and citizenship education. M.M.Isac, M.P.C. van der Werf

score than boys. The number of books at home and the years of expected further education show strong positive relationships with achievement. As expected, not speaking the language of the test at home tends to significantly lower the results on the civic knowledge test. Statistically significant effects were found as well for the factors related with the time for learning and opportunities to learn civic-related content. In this respect, spending evenings outside home is a negative predictor for students' success while having the opportunity to discuss political issues with parents and watching TV news are positively associated with civic knowledge.

In model 2 the contextual variables at school level as well as factors associated with quality, time and opportunity to learn were added to the model. The variables at the school level explain 2,5% of the total variance. Again the significant positive effects ($p < 0.001$) are found for average number of books at home and average years of expected further education. It was found that the proportion of girls in a school/classroom does not make a difference in their scores on the knowledge test. From all instructional variables included in the model only two proved to significantly predict students' success. An open classroom climate for discussions which is associated with the quality factors in Creemers' model is positively associated with students' scores. Contrary to the prior assumption, the opportunities that schools provide for students to enhance civic-associated beliefs and behaviours relate negatively with their success on the knowledge test.

In model 4, the contextual variables at the country level were entered. The difference in deviance is still significant at ($p < 0.001$) and the country level variables explain 4.2% of the total variance. The proportion of girls in a country is associated with civic knowledge in a negative way. Surprisingly, country averages for number of books at home and years of expected further education are negatively associated with students' achievement in civics. The only instructional variable, average time for civic-related topics, is not statistically significant.

4. Conclusion and Implications

The present analyses revealed that Creemers' model can be tested in relation with students' achievement in civic and citizenship education and that secondary analysis of international data can provide interesting insights for educational effectiveness research.

The study shows that there is a country effect on students' achievement in civic education. Therefore further investigations are needed to shed light on these country effects.

In what the validity of Creemers' model for this type of outcome is concerned, it can be concluded that the characteristics of the present results are similar with the ones from other studies that tested the model. This study showed that the influences on students' achievement are multilevel and that some of the variables linked with the main factors in the model are associated with students' civic knowledge. This is true for all the student level variables tested in this investigation which also confirmed previous results from CIVED secondary analyses. Also, the contextual variables at school level and the variable associated with the quality of learning in civic education proved to have the expected effects on student civic knowledge. Therefore, partially the model was covered.

The non-significant effects of variables related with time for learning, quality and opportunities used at school level do not necessarily contradict the model. However the way in which these variables were measured could be a possible explanation for the undetected effect. For example the time that schools and educational systems spend for civic-related topics is not entirely representative for the entire time spent for civic education as is well known that this topic is not transmitted only thru specific subjects but throughout the formal and informal curriculum. This can be also true for the unexpected negative effects of the variable related with the opportunities offered by schools. In the same time, this variable reflected attitudes and behaviours

which are desirable for a citizen but might not be able to support performance in a test situation for civic knowledge.

The negative effects of the contextual factors at the country level were unexpected and further investigations across each country that participated in CIVED must be conducted in order to explain these findings. Therefore, further analyses will test the model for individual countries. Also, a suitable collection of the data related with civic education which starts from a comprehensive theoretical framework and captures the information related to variables relevant for the educational system level can be an important advancement in research on civic and citizenship education.

To conclude, the present study showed the importance of investigating the country effect in a secondary analysis of international data as well as relating different research perspectives. Even if Creemers' model was not entirely supported, most assumptions of the model were met and most factors were associated with students' civic knowledge. It should be acknowledged that CIVED was not designed with the aim of detecting educational effectiveness factors and this was an important limitation for the present investigation. The results can provide a comprehensive theoretical framework for the development and design of future international studies in civic education as well as new perspectives in addressing the data already available from this type of studies.

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Fig.1. The Comprehensive Model of Educational Effectiveness (Creemers, 1994).

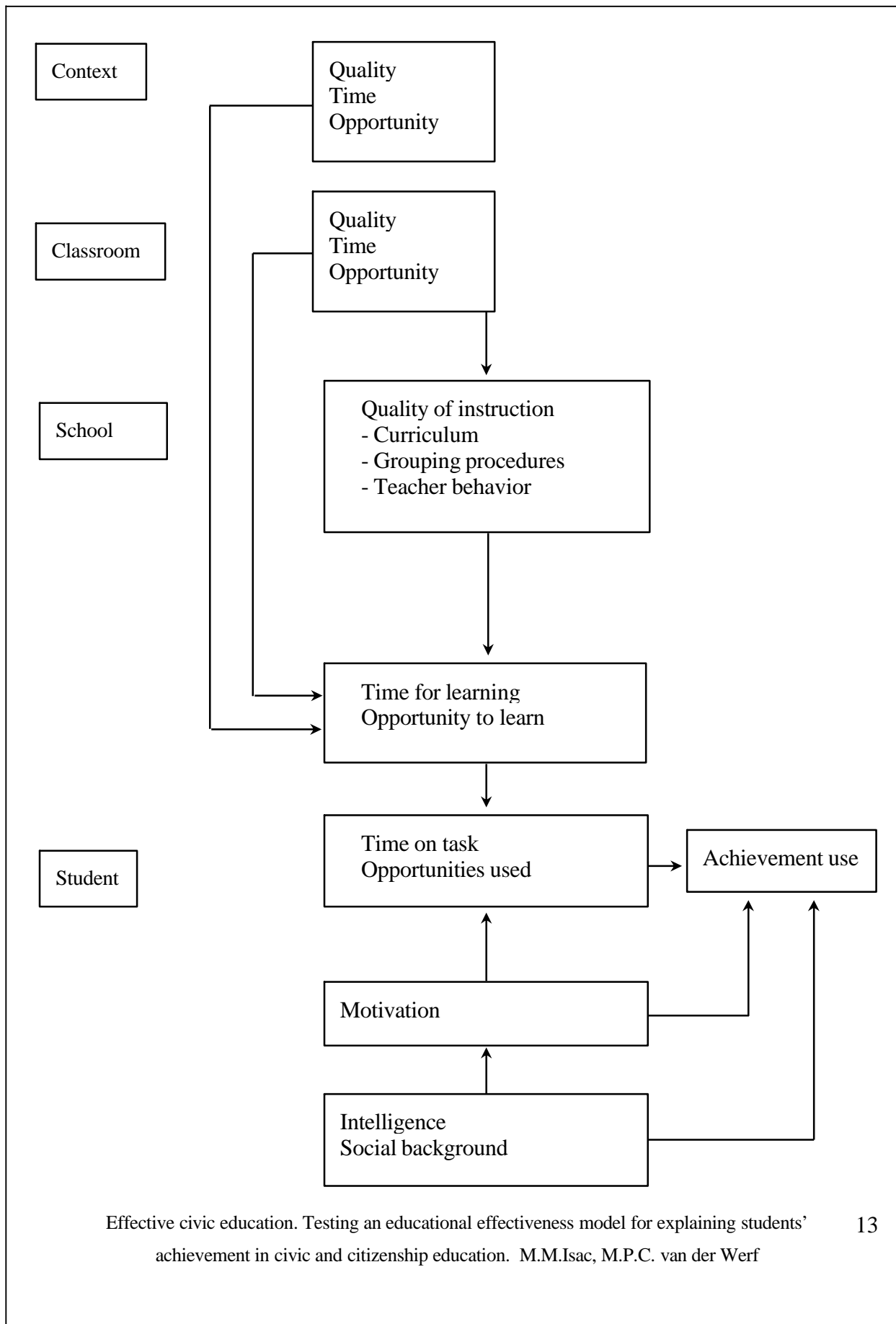


Table 1
Results of multilevel analyses to explain variation in civic knowledge; parameter estimates

	0=empty	1	2	3 = full
Fixed effects				
Constant	399.90(0.20)	381.92(1.14)	345.72(2.74)	408.94(6.11)
Student level				
Gender/Female		-0.50(.12)	-0.55(.12)	-0.55(.12) *
Number of books at home		1.66(.05)	1.48(.05)	1.48(.05)*
Expected further education		3.33(.04)	3.17(.04)	3.17(.04)*
Language of the test at home		-5.90(.28)	-5.76(.28)	-5.72(.28) *
Evenings spent outside		-1.58(.06)	-1.59(.06)	-1.59(.06)*
Political discussions		1.30 (.06)	1.28 (.06)	1.28 (.06)*
TV news		1.91 (.08)	1.90 (.08)	1.89 (.08)*
School				
% gender			0.01(0.0)	0.01(0.0)
Number Books at home (SA)			3.06(.32)	3.12(.32)*
Expected further education (SA)			3.53(.29)	3.58(.30)*
Open classroom climate (SA)			3.16(.20)	2.99(.19)*
Homework assistance			0.59(.30)	0.57(.30)
Availability of teachers			-0.29(.40)	-0.26(.36)
Time			-0.01(.08)	-0.02(.08)
Opportunities offered (SA)			-0.71(.11)	-0.73(.11)*

Table 1
Results of multilevel analyses to explain variation in civic knowledge; parameter estimates(Continued)

Effective civic education. Testing an educational effectiveness model for explaining students' achievement in civic and citizenship education. M.M.Isac, 14

	0=empty	1	2	3 = full
Country				
% gender				-0.46(.11) *
Number of books at home (CA)				-4.27(.59) *
Expected further education (CA)				-8.35(.65) *
Time (CA)				0.10(.16)
Random effects				
Country level	0.00(0.00)	4.35(1.49)	17.72(5.47)	0.45(0.27)
School level	112.31(3.18)	73.26 (2.16)	50.19 (1.57)	50.17 (1.57)
Student level	299.82 (1.54)	255.65 (1.36)	255.69(1.36)	255.70(1.36)
Deviance	629957.70	620177.30	619236.30	619171.3
Decrease in deviance		9780.4*	941*	65*

Notes. SA = school average; CA = country average. Fixed coefficients are followed by their standard error. * p < .001;

Appendix I

Identifying explanatory variables within IEA Civic Education Study (CIVED):

In order to identify relevant variables from CIVED study several sources were considered: the variables and characteristics of Creemers' model (Creemers, 1994), previous studies that investigated the model on TIMSS (IEA) mathematics dataset (Creemers & Kyriakides, 2007, Kyriakides, 2006) and the description of the variables in the IEA Civic Education Study technical report (Schultz & Sibberns, 2004). Finding from previous analysis of CIVED dataset are considered.

According to the main principles of the model, variables were identified within categories as context, time, opportunity and quality factors and can be organized in three levels (student, school/classroom and country level) to recognize the multilevel influences on students' civic achievement that Creemers' model assumes.

Explanatory variables at student level.

- **Student background factors.** Indicators of student background are gender (girls are the reference category) and SES (home literacy = number of books at home). This last variable can be seen as a proxy indicator for the socio-economic level of the student (Schultz, 2002). The variable correlates highly with the educational level of the parents which cannot be included in the analysis due to high levels of non-response.
- **Expectations.** A relevant variable from CIVED is years of expected education. It refers to how many years of further education students expect after the current year (Schultz, 2002) It can be regarded as an indicator of students general ability and motivation to improve his knowledge.
- **Time factors.** Actual time on task spend by the students cannot be assessed within CIVED. A proxy for this variable can be students' reports about how often they spend evenings outside of their families with their friends. Students with high scores on this variable may tend to neglect their study (Schultz, 2002)
- **Opportunity factors** Because information on the amount of time spent doing homework was not available in the CivEd data, "political discussions with parents" was seen as a measure of the opportunity factor

Explanatory variables at classroom (school level) level.

- **Contextual factors.** Variables related to the context of the classroom as percentage of girls and average home literacy (SES) are measured. These can be aggregated from the student-level data. Other contextual variables are concerned with the characteristics of teachers' experience. Information on teachers experience reveals whether the teacher holds an academic degree in a civic related discipline or whether he participated in in-service professional activities in a discipline related to social studies or civic education. (Torney-Purta, Richardson & Barber, 2005)
- **Quality of instruction** it is considered to be one of the main factors that account for students' learning. The variables measured in CIVED cannot offer the entire information located at this level as prescribed by the model so indicators of quality of instruction will be poorly covered. However, there are indications on teachers' behaviour that facilitates an "open classroom climate". This variable reflects students' perceptions of an open classroom climate for discussions and it was proven to be a strong predictor of civic

knowledge in several studies based on CIVED. The scores for this variable at classroom (school) level will be aggregated from the student-level data.

- **Time factors.** An indicator for this factor can be found in the school questionnaire and refers to the amount of time (hours) per week which students are required to spend on taking classes in civic-related subjects (history, social sciences, law and economics).
- **Opportunity to learn.** Even though the available data does not contain any indicator of the amount of homework that students usually undertake for civic-related topics there is an indication of the existence of assessment measures and the types of assessment measures that are used for this topic.

Explanatory variables at the country level.

- **Context.** Contextual factors at the country level concern average SES indicators which can be aggregated from the student-level data. Also, the school questionnaire provides information on the frequency of student behaviours that cause problems in schools life.
- **Quality factors.** At country level, information on conditions for the quality of instruction can be gathered from the school questionnaire. It is not possible to identify the extent to which a school has developed rules and regulations related to citizenship education. However, the extent in which the school disposes of teachers who cover civic-related topics and the percentage that these teachers represent from the overall number of teachers in that school can be regarded as conditions for the quality of instruction at this level. Quality factors can also be measured by the extent to which parents are involved in school life.
- **Time factors.** In order to investigate the country effect, time factors concerning average amount of time (hours) per week which students are required to spend on taking classes in civic-related subjects are measured. The school questionnaire provides this information.
- **Opportunity to learn.** Among the factors that indicate the opportunity to learn is consensus about the mission of the school. In the case of civic education and considering the available data an indicator of opportunity to learn can be teachers' agreement about the way civic education should be thought.

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