"Institutional Factors and Teacher Characteristics Affecting Classroom Technology Use: Evidence from a nationally-representative sample in Spain"

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Objectives, purposes and theoretical frameworks

The innovative use of information and communication technologies (ICT) in education is still the domain of a relatively small number of teachers, especially outside the most advanced countries. We start from the premise that practices that encourage independent, collaborative and autonomous learning (Kozma & Anderson 2002) better prepare students for life in the "knowledge society" and hence should be encouraged through appropriate policy measures. s.We attempt to identify particular resources that innovative ICT users are drawing upon (both institutional and personal) which could potentially be made accessible to other schools and other teachers. In particular, we try to answer the question whether the contributing factors for innovative use are mainly "manipulative" or "non-manipulative" (Drent & Meelissen 2008), i.e. amenable to be influenced by schools or requiring broader policy intervention (including for instance teacher pre-service training).

Methods and Data Sources

In a first, descriptive part of the analysis, meaningful groups of teachers are formed on the basis of their reported ICT use in the classroom. We consider groups to be meaningful if they have predictive ability for other relevant behavioral or sociodemographic characteristics. In a second step, we aim to develop a parsimonious and relevant model for classifying teachers into these different groups on the basis of institutional and personal variables. Concretely, cluster analysis is employed to develop a taxonomy of teachers with regard to ICT classroom use. We distinguish between three types of ICT users based on the frequency and variety of classroom use. Discriminant analysis is then employed to predict membership in these user groups from a set of "structural" and "cultural" characteristics at both the individual and school levels. Different robustness checks are performed, in particular the regression of an index of innovative use on the same set of variables. The results are encouragingly consistent across the various model specifications and are supported by cross-validation with a holdout sample. The main data source for this study is a nationally-representative survey on teachers' attitudes, experience with, and use of new technology in Spanish primary and secondary schools (described in Sigalés et al. 2008). The stratified multi-stage sampling procedure yielded a sample of 1697 teachers, 653 of which were retained in the final analysis.

Results

The hypothesis suggested by our analysis sees *access to internet and ICT resources at school* as well as *digital literacy for advanced internet use* as the most important predictors for innovative use of ICT in education. Of slightly less importance are *frequency of internet access* and *educational ICT training* as well as *positive ICT attitudes* by teachers. On a more detailed level of analysis, the results suggest that the availability of networked computers in classrooms and in the school more generally, as well as easy access to programs and other software are considered helpful factors by more heavy ICT users. An important non-manipulative teacher characteristic of some importance is the ability to publish contents on the internet. Still, the nature and characteristics of teachers recruited to the profession is key.

Scholarly significance and policy implications

We conclude that infrastructure bottlenecks, which are clearly a manipulative school-level factor, might still be the appropriate locus of intervention for schools that attempt to encourage innovative ICT use. There might also be a significant payoff in refocusing some of the efforts in ICT education for teachers beyond basic computer skills on more intermediate internet and Web 2.0 competences.

References

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