



Multidisciplinary Journal of Educational Research

Volume 4, Number 1

Hipatia Press

www.hipatiapress.com



Articles

School Choice and Inequality in Educational Decisions – Mauricio Farias.....	1
Unequal Partnerships in Higher Education: Pedagogic Innovations in an Electronics within Physics Degree Course – Maddalena Taras, Francisco M. Gómez & Juan B. Roldán.....	35
The Crisis of Disengagement: A Discussion on Motivation Change and Maintenance Across the Primary-Secondary School Transition – Cheng-Yu Chung.....	70
The Role of Its in Improving Teaching Quality in Schools: A Multicase Study – José Luis Aróstegui & José Luis Guerrero.....	101

Reviews

¿Qué estás mirando? 150 años de Arte Moderno – Flora Racionero Siles.....	125
List of 2013 Reviewers.....	127

School Choice and Inequality in Educational Decisions

Mauricio Farias
Fundación Chile

Abstract

School choice has been growing all over the world. However, despite the strong implications school choice could have on future opportunities, the understanding of the mechanisms underlying the school decisions are still not clear. Based on elements from different theories, this paper study factors related with a school- track choice. The study takes advantage of extensive administrative records, national tests, and an ad-hoc survey from Chile, a country with more than 30 years with an educational system based on choice. Results suggest that socioeconomic status, cultural values, the pressure of the environment, parents' expectations, and self-perception are correlated with the school-track choice. Results suggest that the concept of equality of opportunities in an educational system based on choice should also consider equality in the capacity for taking these decisions.

Keywords: school choice, vocational education, human capital, cultural capital, social capital

Elección de Escuela y Desigualdad en las Decisiones Educativas

Mauricio Farias
Fundación Chile

Resumen

La elección de escuelas ha estado creciendo por todo el mundo. Sin embargo, a pesar de las fuertes implicaciones que la elección de escuelas podría tener en oportunidades futuras, el conocimiento de los mecanismos subyacentes a las decisiones educativas todavía no está claro. Basado en aspectos de teorías diferentes, este ensayo analiza factores relacionados con la elección de escuela. El estudio (literalmente dice “se aprovecha”) se sirve de los amplios (literalmente: extensos) registros administrativos, pruebas nacionales, y una encuesta ad hoc de Chile, un país que lleva más de 30 años con un sistema educativo basado en la elección. Los resultados sugieren que el estatus socioeconómico, los valores culturales, la presión del ambiente, las expectativas de los padres, y la autopercepción se correlacionan (tienen una correlación) con la elección de escuela. Los resultados sugieren que el concepto de la igualdad de oportunidades en un sistema educativo basado en elección también debería tener en cuenta la igualdad en la capacidad de tomar estas decisiones.

Palabras clave: Elección de escuela, educación profesional, capital humano, capital cultural, capital social

School choice has been growing all over the world. However, despite the strong implications school choice could have on future opportunities (Kirst & Venezia, 2004), the understanding of the mechanism underlying the school decisions is still not clear. This decision could be particularly harmful for high-performance low-income students with high academic expectations (Farias & Carrasco, 2012). In this paper I analyze how these students choose school and track at the end of eighth grade in Chile.¹ I found that cultural and social factors are strongly correlated with the decision, suggesting that choice systems require considering these factors in order to be more equitable.

In order to better understand the factors that affect decisions, I use the theories of human capital (Becker, 1964; Schultz, 1963), cultural capital (Bourdieu, 1986; Bourdieu & Passeron, 1977), and social capital (Coleman, 1988; Putnam, 1995). I also employ elements from developmental theories and school choice theories to enrich the analysis (Schneider, M., Elacqua, G., & Buckley, 2006; Chumacero, Gómez & Paredes, 2011; Tedin & Weiher, 2004; Chubb & Moe, 1990; Saporito & Lareau, 1999; Bosetti, 2004).

The literature is extensive but limited. Many studies are only observational and restricted to small samples (e.g., McDonough, 1997). Others focuses on career decisions made at the end of secondary school (St. John, Hu & Fisher, 2011; Gao, 2011), and there are still discussions about the effects of social class on mobility (Boudon, 1974; Erikson & Rudolphi, 2010). Finally, many Chilean studies explore how families choose between private and public schools (Chumacero *et al.*, 2011; Schneider *et al.*, 2006; Gallego & Hernando, 2008).

Using rich census data gathered at the individual level (including test scores and surveys), this paper will shed light on the factors related to the school-career decision at the end of eighth grade in Chile. The school

decision is mixed with the choice between Vocational Education at Secondary Level (VESL) and Academic Education at Secondary Level (AESL).

The study answers the question: What are the factors that explain the choices high-performing, low-income students make about attending either VESL or AESL schools in Chile?

I address this question, by studying the following questions:

1. Do cultural factors affect students' decisions?
2. Do social factors affect students' decisions?
3. Do these factors change when considering the interaction between the VESL/AESL career decision and the type of school decision (public/private)?
4. Does the impact of these factors change when analyzing high-performing students?

Literature

One of the most popular explanations for educational decisions is human capital theory (Becker, 1964; Schultz, 1963). Human capital can be understood as the stock of knowledge and skills that produces economic value. In this theory, the individual chooses her most profitable level of education based on elements such as abilities; information; costs and benefits of the decision; risk aversion rate; and personal preferences. Failure to satisfy the basic assumptions of this theory could affect the decision process. In particular, lack or high cost of information, imperfect financial markets, or non-rational behaviors could lead to suboptimal decisions. The failure of these assumptions is particular prevalent among poor students. For instance, a higher discount rate could reduce the decision horizon, thereby reducing the available alternatives (Shapiro, 2005); financial restrictions may limit schooling opportunities (Mare, 1980; Carneiro & Heckman, 2002); and access to more and better information could allow low-income

families to choose better schools with higher test scores (Hastings, Kane, & Staiger, 2007).

Another important literature builds on cultural capital theory (Bourdieu, 1986; Bourdieu & Passeron, 1977) and social capital theory (Coleman, 1988; Putnam, 1995). These theories suggest that culture and networks mediate decisions. Cultural capital is an embodied state, related to the “long-lasting disposition of the mind and body” (Bourdieu, 1986, p. 243). This is the knowledge, the culture, the traditions, and the “habitus” that are inherited during long periods of time that schools do not teach but are transferred by families. They are embodied in the person itself, in her attitudes, words, and choices. The most valued cultural capital is that embodied by upper class which allows upper classes to maintain their status and privileges. “Habitus” refer to those actions, beliefs, or perceptions done or used systematically without other rationality than being acquired from the family. The cultural capital of family, friends, school, and community exerts strong influences on students’ achievement (Carnoy, 2007; DiMaggio, 1982) and career choices (McDonough, 1977; St. John *et al.*, 2011).

The concept of social capital is defined as “social networks, norms and sanctions that facilitate co-operative action among individuals and communities” (Halpern, 2005, p.39). Elements such as family networks and trust can affect both access to information and choices. Networks could influence decisions by imposing norms and sanctions to their members; also by increasing the access to information of members (Coleman, 1988; Putnam, 1995). Peers can influence student’s achievement (Sacerdote & Marmaros, 2005) and certainly peers’ aspirations also play a role in re-enforce student’s decisions (Yonezawa, Wells & Serna, 2002; St. John *et al.*, 2011).

Based on a qualitative study of students at four schools, McDonough (1997) proposes clues about the factors that affect college choice: i) a student’s cultural capital affects the level and quality of the college chosen; ii) college choice may be affected by the habitus of family, friends, school,

and community; and iii) the student makes decisions between possible alternatives using a process of “bounded rationality”² constrained by cultural norms and habits.

The school choice literature mirrors the different views presented above. Most of this research has focused on clarifying whether parents make choices based on quality. Some authors argue that parents are strongly influenced by school quality; therefore choice and competition increase the quality of the entire system (Schneider *et al.*, 2006; Chumacero *et al.*, 2011; Tedin & Weiher, 2004; Chubb & Moe, 1990). However, other authors suggest that factors such as cultural values or the incapacity to make good choices could affect this decision, restricting the effect of competition on quality (Saporito & Lareau, 1999; Schneider *et al.*, 2006; Bosetti, 2004). Most of this research looks at elements such as: ability, SES, school type (public or private), distance from home to school, single gender schools, and advice from friends and family that may influence families’ school choice (Hearn, 1984; Manski, 1990; Ascher, Frucher & Berne, 1996; Beattie, 2002; Brown, Duaine & Associates, 2002; Kirst & Venezia, 2004; Tolsma, Need & de Jong, 2010). Research in Chile also considers factors including values (religion), discipline in the school, and copayment (Chumacero *et al.*, 2011; Bassi & Galiani, 2010; Gallego & Hernando, 2009; De Iruarizaga, 2009; Microdatos, 2009; Schneider *et al.*, 2006).

The literature on career choice is extensive and useful (Manski, 1990; Beattie, 2002; Brown *et al.*, 2002). However, it is largely focused on the last years of school. For college enrollment, Manski (1990) found that students rely on estimates of their own academic capabilities. Tolsma *et al.* (2010) argue that subjective success probabilities are better estimators of student decisions than the real ability measured by previous test scores. Moreover, subjective rates of return and relative risk aversion rates influence students’ aspirations, in particular by encouraging the avoidance of downward mobility. Motivation is also important. Yonezawa *et al.* (2002) argue that students have “tracked aspirations” which could be shaped by race, gender,

parents, peers, school structure, and culture.

A number of studies looking at this decision have also been conducted in Chile. Caceres and Bobenrieth (1994) found that families choose schools based on relative wages, income, and previous information about high school options. De Iruarrizaga (2009) highlighted ability and income as determinants of the decision. In a retrospective survey, Microdatos (2009) found that the main reasons for choosing a secondary school for VESL students was distance, good references, and the specialization in the students' desired career. The main reasons for choosing VESL career were reported to be the acquisition of skills in a specific area, the desired to continue to higher education, and in order to find a job after finishing school. Despite this extensive literature, there is little research that looks at school choice and career decisions simultaneously. Most of the available literature only considers the transition between high school and college.

The Chilean educational system

The Chilean education is based on a generalized quasi-voucher system established in 1980. The voucher is paid directly to schools, following students' enrollment. This reform allowed families to choose schools. Primary goes from first to eighth grade and Secondary, from ninth to twelfth grade. Officially, students choose a track (VESL or AESL) after tenth grade; however, about half of the population changes school between eighth and ninth grade. This paper looks into this group of students who are at the same time choosing school and track. The decision is free and students can change their decision after having made the choice. About 46% of all students choose VESL.

The law allows schools to define their own curriculum conditional on certain requirements. VESL schools are required to take 600 instructional hours per year from the four core subjects (language, math, sciences, and history) and allocate them to vocational courses. After secondary school,

VESL students can go on to higher education either at the university level or at a technical higher education institution (VETL).

Theoretical framework

The literature suggests several factors that could be related to the school-career decision.

Table 1
Factors related to the school/program decision (examples)

Human Capital	Cultural Capital	Social Capital	Career Choice	Others
- School cost	- Value of	- Access to	- Students' self-	- Gender
- Abilities (test	VESL	information	perception	- Race
scores)	- Knowledge	- Peers'	- Expectations	
- Risk aversion	about higher	aspirations	- Academic	
rate	education	- Parent's and	engagement	
- Discount rate	Preparation	teachers'		
- Rates of	for decision	aspirations		
return	- Intention to			
- Income	work			
differences	- SES (parents'			
- Distance to	schooling)			
school				

The main hypotheses to be tested are:

- 1. *Students with higher cultural capital will choose AESL.*
- a. *More knowledge about higher education will lead to enrollment in AESL.*

Knowledge about higher education represents an important part of the cultural capital of a family that affects access to higher education (St. John *et al.*, 2011). Lack of knowledge about higher education and how the system works could increase the perceived complexity of the system and discourage enrollment. For instance, this may increase students' perception of the

difficulty of higher education, leading to inaccurate estimates of the benefits and costs of attendance (Boudon, 1974; Usher, 2005).

b. *Students/families that spend more time researching school options will choose AESL.*

One of the factors tested is how the family approaches the decision process. The idea of bounded rationality assumes that habits may reduce alternatives (McDonough, 1997). The ability to anticipate and understand the informational requirements for the decision, the capacity to look for information in different sources and to evaluate multiple alternatives could affect the decision made. For instance, Schneider *et al.* (2006) found that middle-income students make use of choice more frequently than low-income students. It could be the case that the lack of information leads high-performance, low-income students to loss opportunities to access high achievement schools (e.g., application deadlines or other requirements). I hypothesize that, students who do not prepare well to make this decision (e.g., look for less information, or visit fewer schools) tend to choose VESL. Evidence of less rigorous preparation by Hispanic students was reported by Roderick *et al.* (2008).

c. *Students who tend to value VESL more than AESL will choose VESL.*

The way in which students value VESL as a mean to obtain different life goals measures their taste for AESL or VESL, which may in turn be seen as a reflecting their families' cultural capital.³ The hypothesis is that elites (economical, political or academic) tend to prefer AESL and that low SES students tend to prefer VESL. These beliefs about VESL influence the final choice. In Chile, Arancibia (1994) found important differences in the value placed on VESL and AESL by SES.

d. *Students who prioritize wages over their own career interests will choose AESL.*

Preferences can affect decisions (Loeb & Klasik, 2010) and may be shaped by families' culture and habitus. The hypothesis here is that students who prefer to earn higher wages rather than pursue their career interests will

tend to chose AESL, since this trajectory is associated with higher compensation in the labor market.

e. *Students thinking of transitioning directly into the labor force after school are more likely to enroll in VESL.*

Similarly to the previous hypothesis, students may think in eighth grade that they will find work immediately after completing the twelfth grade, an attitude that mirrors the culture, the preferences, and probably the SES of the family.

f. *Students with economic concerns about higher education tend to choose VESL.*

Concerns about future college costs could make students less likely to pursue higher education. In Chile, during 2011, a huge students' strike ask for a free of charge higher education in order to reduce the debts that low income students acquire in higher education. The high cost of the tuition or the lack of knowledge about funding for higher education (Sallie Mae fund, 2003), could inhibit the access to higher education. This may influence their level of engagement in the school environment, and consequently their preparation for college. In addition, it could affect college choice (Mare, 1980; Enersen, Servaty-Seib, Pistilli & Koch, 2008; St. John *et al.*, 2011).

2. *A positive self-image increases the likelihood of choosing AESL.*

a. *Students who have a high subjective perception of their abilities will tend to choose AESL.*

Subjective perception of a student's ability is an important predictor of career choices (Manski, 1990; Yonezawa *et al.*, 2002; Tolsma *et al.*, 2010). Because AESL is more challenging than VESL, it is expected that students with greater confidence in their abilities tend to choose AESL. The variable used here compares the real ranking obtained from the national test score (not known by the student) with the student subjective perception of her ranking in the test.

b. *Students with higher academic expectations will choose AESL.*

The relationship between expectations and future educational attainment has been extensively studied (Bozick, Alexander, Entwisle, Dauber & Kerr, 2010; Hao & Bonstead-Bruns, 1998). Those who expect to pursue a bachelor's degree will enroll in AESL. Those only expecting (in eighth grade) to pursue a secondary vocational degree, will enroll in VESL. The relationship between those expecting to go to a VETL institutions and the type of enrollment they prefer is not clear.

3. *Networks exert influence on school choices.*

Networks have an important role in shaping decisions (Coleman, 1988; Putnam, 1994, 1995); in particular, career decisions (St. John *et al.*, 2011; Usher, 2005). The pressure that parents, teachers, and friends exert on a student may affect her choices: the more a student perceives external pressure to attend a VESL school, the higher is the likelihood that she will choose VESL.

4. *Higher discount rates and higher risk aversion rates increase the likelihood of choosing VESL.*

a. *Students with higher discount rates will prefer VESL.*

The hypothesis is that, students who strongly value the present tend to make short-term decisions (Usher, 2006; Gonzalez, 2011). It is likely that these students will prefer VESL as this path could accelerate their access to the labor market.

b. *Students with higher risk aversion rates will prefer VESL.*

It could be riskier to make a long-term investment in a career than to opt to enter the labor market immediately after finishing school (Gonzalez, 2011). The risk of failure in more complex long-term forms of employment could appear high to low-income students, who may worry about accruing debts while struggling to complete a higher education credential.

Other variables used as controls in the models are:

Female: Gender could affect decisions due to sex-stereotyped perceptions of occupations (Brown *et al.*, 2002)

Disposition to pay: This variable is measured as the maximum between the actual tuition paid in the school in 2011 and the tuition paid in the school in 2012.

Test scores: Included as a proxy for ability, this variable is the student's average of the standardized scores in math, language, science and social science from the national test (SIMCE) taken in 2011. Students with high ability will choose AESL (Boudon, 1974; Blossfeld & Shavi, 2000).

Relative distance: Distance is usually an important determinant of school choice (Chumacero *et al.*, 2011; Microdatos, 2009). Higher costs, more time, and a lack of information about more distant schools could lead students to choose by proximity. This variable measures the difference in distance between i) the closest academic school and the student's home and ii) the closest vocational school and the student's home.

Socioeconomic status (SES): Higher SES will lead students to choose AESL. More educated parents can better support their children academically, increasing their performance and also preparing them for a more challenging education. In addition, they may help students to better assess the benefits and cost of higher education⁴ (Boudon, 1974; Erikson & Rudolphi, 2010).

Data and methodology

This study uses a rich panel of census data from governmental sources.

Table 2

Data from governmental sources

Source	Grade/ year	Level	Example of variables
National survey (Students and parents)	4 th /2006	Individual	Race, school level expected, mother's and father's schooling, income per capita, number of
	4 th /2007	Individual	
	8 th /2011	Individual	

			books at home, parents' occupations, reasons to choose school
National test	4 th /2006	Individual	Test score in: language, math, sciences, and history It covers 93 percent of the population
	4 th /2007	Individual	
	8 th /2011	Individual	
	8 th /2009	School	
	10 th /2010	School	
Administrative data	2006 to 2012	Individual	Enrollment (including the new school chosen in 2012), school characteristics (urban/rural, public/private, VESL/AESL, cost, location), student characteristics

In order to better understand the factors that correlate with the school/career choice, the study takes advantage of an ad hoc survey conducted in November 2011.

Table 3

Ad hoc survey

Design and application	The survey was designed and conducted by the author with the support of sociology students
Universe of study	211 urban schools in Santiago whose highest level is eighth grade, from the three highest quintiles of performance on the national test.
Unit	The student.
Sample	A stratified random sample of 52 schools. The number of schools per stratum was proportional to the schools per stratum in the universe. Eight strata were defined by four socioeconomic groups and by type of school (private /public). One randomly chosen full class per school was surveyed.
Method	Self-applied questionnaires for all students in the class.
Survey statistics	1,463 students answered the questionnaire. The response rate of the survey reached 85% (84% weighted response rate), mainly due to regular absences on the day of the survey. The average response rate within responded surveys was 93 percent. 100 percent of

records matched with administrative data 2011. 90% matched with scores from the fourth grade SIMCE (2006 and 2007). Ten percent of questionnaires were double-entered, just an error of one percent was detected.

Topics Social capital, cultural capital, preferences, and self-perception.

A summary of the variables is presented in Table 4.

Table 4

Sum of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Student's characteristics</i>					
Female	1463	0.49	0.50	0.00	1.00
Repeater	1411	0.17	0.38	0.00	1.00
Mother's schooling (std)	1305	0.00	1.00	-3.46	2.06
College cost concern	1408	0.57	0.49	0.00	1.00
<i>School characteristics</i>					
Rural	1463	0.14	0.35	0.00	1.00
Average parents' disposition to pay (std)	1463	0.00	1.00	-0.83	3.89
Test Score 8th grade 2011 (std)	1427	0.00	1.00	-3.47	2.93
Difference in distance AESL-VESL schools (std)	1243	0.00	1.00	-2.12	6.83
<i>Parents' Expectations and self perception</i>					
Expectation: Incomplete secondary	1463	0.01	0.09	0.00	1.00
Expectation: VESL	1463	0.17	0.38	0.00	1.00
Expectation: AESL	1463	0.03	0.16	0.00	1.00
Expectation: VETL	1463	0.17	0.38	0.00	1.00
Expectation: Bachelor degree	1463	0.04	0.20	0.00	1.00

No Expectation	1463	0.25	0.43	0.00	1.00
Difference in perceived vs real ranking (std)	1336	0.00	1.00	-3.57	3.42
<i>Cultural Capital</i>					
Knowledge about higher education	1420	1.85	0.98	0.00	4.00
Preparation Index (std)	1449	0.00	1.00	-1.56	7.39
Continue Working	1463	0.20	0.40	0.00	1.00
Prefer wage (than interest)	1402	0.41	0.49	0.00	1.00
Value VESL/AESL index (std)	1463	0.00	1.00	-2.61	2.17
<i>Social Capital</i>					
Pressure towards VESL (std)	1393	0.00	1.00	-1.18	1.15
<i>Discount and Risk Aversion rates</i>					
Discount rate	1421	2.30	4.94	-0.10	19.00
Risk Aversion rate	833	0.83	2.60	-0.21	9.78
<i>Other</i>					
Gender bias index	1463	0.59	0.83	0.00	2.00
School chose by values	1463	0.35	0.48	0.00	1.00
<i>Outputs</i>					
Student's preference VESL/AESL from survey	1431	0.65	0.48	0.00	1.00
Student's actual enrolment VESL/AESL	1389	0.64	0.48	0.00	1.00
Student's actual enrolment 4 groups (VESL/AESL, Pr/Pub)	1386	3.10	1.07	1.00	4.00

The methodology included the use of factor analysis to build variables and run multinomial and binomial logit regressions, in order to determine the factors related to the school-program decision. I used two variables as outputs: the student's preference for VESL or AESL as declared in the

survey, and the student's actual enrollment in a VESL or AESL school obtained from the administrative data in the next school year (2012). For reasons of brevity only results with actual enrollment are displayed. The relationship is defined by the following model:

$$\text{logit}(p_i) = \ln(p_i / (1 - p_i)) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon \quad (1)$$

where p_i is the probability that a student chooses to enroll in VESL; X_1 is a vector of student and school characteristics; and X_2 represents the different sets of variables included to test each hypotheses stated in the theoretical framework. In addition, I constructed a full model incorporating the complete set of hypotheses. I also ran a multinomial logistic regression using four types of schools as outcome: public AESL; public VESL; private AESL; and private VESL.

In order to understand the decisions of those students with better performance or higher expectations, I re-ran the full model and the multinomial regression for: the subsample of the students who perform above average in SIMCE eighth grade 2011; those who declared that they expect to obtain at least a bachelor's degree; and a combination of both criteria.

Limitations

This study is conceived as an exploratory analysis that presents three main limitations. First, the external validity is restricted to the sample selected. Second, there could be significant measurement errors. The survey was administered to eighth graders, and the school-career decision at this age (13 years) could be strongly influenced by parents. As students' opinions generally mirror those of their parents, and my goal was to understand students' perspectives, I opted for student survey.¹ In addition, the concept of cultural capital is hard to isolate from variables such as ability (measured by previous test scores) and SES. For instance, the survey contains a question

addressing the student's perception of which type of secondary education is better for life, work, or obtaining a bachelor's degree. While the question was designed to provide insights into the role of cultural capital, the answer may not necessarily be related to culture. It could be the case that under certain circumstances (e.g. poorly performing schools near the student's house) VESL may be a better route to prepare for a bachelor's degree than AESL. These situations, while unlikely to be widespread, could be biasing results. Third, the analysis is relational and not causal.

Results

Overview of the survey

The survey results suggest that culture, the influence of the environment, self-perception, and economic elements converge to explain the decision to study in a VESL school. The following seem to be particularly important: poor preparation for the decision; cultural factors and beliefs about the value of VESL; uniformity of opinion in the immediate environment of the student; misperceptions about actual academic performance; overestimation of the benefits of technical careers; or excessive impatience.

A preliminary analysis of the data shows that families do not engage extensively with the school decision process, resulting in an average of only 1.9 applications per student. They seek information from two or fewer schools, and in general this information comes from the school to which they are applying. These results are consistent with González (2011). Additionally, school support for the application process seems to exist only in a little over half of the schools; the quality and objectivity of these procedures is questionable. Furthermore, only three out of ten students report that the school decision will be made only by their parents.

The key reasons cited for choosing a school are: having the expertise that matches students' career aspirations, the quality of teaching, and proximity. Approximately one in four students is uncertain about whether to choose

VESL or AESL; however, most schools cater only to a single program (VESL or AESL). A little over a third of students who do choose AESL are seeking continuity in education, while just over a quarter of those who choose VESL argue they did it in order to work after school. There appears to be a degree of inconsistency in the reasons for students give for choosing a program and their expressed ambitions following high school. One in ten students chooses AESL to enter the labor market after twelfth grade, and one in seven chooses VESL in order to continue their studies.

In terms of culture, the survey shows that students believe that VESL better prepares students for the job market, for VETL, and also for life (although students perceive little difference between AESL and VSL in the latter category). Students predominantly believe that AESL better prepares students for a BD. Additionally the idea that college can be very expensive could divert some students from AESL. These factors, combined with poor preparation to make a school choice decision, provide evidence for the existence of a habitus that leads students to attend VESL institutions without having properly considered and evaluated the alternatives.

The influence of the environment is represented by the index for external pressure. While 20 percent of the students reported that no one told them they should pursue VESL, a similar percentage of students claimed they were advised by their teachers, parents and friends to attend a VESL school. Apart from parents, family members appear to have a strong influence on the decision (48 percent), which is consistent with Usher (2005). The role of teachers and school administrators is weak (only six percent mention this as most important influence on their decision), providing support for the idea that the guidance processes developed by the schools are ineffective.

In terms of self-image, almost a third of the students reported not feeling smart enough to succeed in higher education. However, most of the students tended to overestimate their performance compared to their actual SIMCE performance.

An exploration of the economics of students' decisions confirmed the findings of national and international literature: poor students tend to underestimate BD revenues and overestimate VESL/VETL revenues (Boudon, 1974; Usher, 2005; Gonzalez, 2011). Also, more students underestimate the costs of higher education; even though on average students overestimate the cost. This situation also indicates among a particular group (not a majority) there is a belief that the costs of education are too high. Turning to discount rates, approximately one in ten students are highly impatient, that is, they are unwilling to postpone a current benefit for a future benefit of the same size plus an extra prize, regardless of the size of the prize. The decisions of these students tend to be short-term. A teacher from a low-SES school utters in the survey: "The majority of them [students] choose a VESL school. They need and want a job as soon as possible. Their parents do not think of or have as expectations that they will study for many years due to economic issues or lack of information." In analyzing the NPV, it therefore appears reasonable that many students choose VESL over other alternatives that they think produce lower and delayed revenues.

Basic analysis

The survey confirmed most of the expectations for basic variables⁵ and assumptions (Table 5A & 5B). Higher SES was related to a lower likelihood of choosing VESL. The same was true for ability, being female, willingness to pay for education, and preparation for the decision. On the contrary, a higher intention to work after 12th grade, preference for wage, value of VESL over AESL, vocational expectations (VESL or VETL), pressure towards VESL, and risk aversion, are related with a higher likelihood of choosing VESL. The coefficient on relative distance between the closest academic and vocational school acted in the expected direction, but did not appear significant when all variables were included. The same was true for college cost concern and higher educational knowledge. Attendance at a

school located in a rural community appeared to be significantly negatively correlated with actual enrollment in VESL.

The evidence supports the hypothesis that greater cultural capital is positively correlated with students' decision to choose AESL. The hypothesis that better self-image is associated with the choice of AESL over VESL was confirmed. This suggests that students who underestimated their abilities tended to choose VESL. Discount rate was not statistically different from zero.

Table 5A

Assumptions

Estimation	1	2	3	4	5	6
<i>Cultural capital Assumptions</i>						
HE knowledge (N=953)	0.952 (0.072)	0.952 (0.071)	0.924 (0.071)	0.916 (0.070)	0.880 (0.072)	0.881 (0.072)
Index: Preparation for decision (N=953)	0.713** (0.056)	0.723** (0.059)	0.775** (0.062)	0.809* (0.068)	0.854+ (0.074)	0.855+ (0.075)
Work after 12th grade (N=953)	2.620** (0.602)	2.607** (0.597)	2.256** (0.516)	2.122** (0.504)	2.115** (0.512)	2.149** (0.524)
Preference: Wage (N=953)	1.365* (0.210)	1.315+ (0.195)	1.172 (0.173)	1.020 (0.151)	0.984 (0.156)	0.990 (0.159)
Value VESL/AESL (N=953)	1.992** (0.165)	1.989** (0.165)	1.964** (0.159)	1.905** (0.154)	1.931** (0.157)	1.930** (0.158)
College cost concern (N=953)	1.010 (0.159)	1.021 (0.160)	1.030 (0.161)	1.098 (0.171)	1.043 (0.173)	1.051 (0.175)
<i>Self perception assumption</i>						
Difference ranking	1.093	1.102	1.102	1.188**	1.197**	1.198**

(R-P)

(n=953)	(0.065)	(0.066)	(0.067)	(0.076)	(0.077)	(0.077)
Parents' Ex. VESL	5.573**	5.463**	4.266**	3.518**	3.329**	3.343**
	(1.705)	(1.631)	(1.175)	(0.970)	(0.927)	(0.928)
Parents' Ex. AESL	1.732	1.663	1.161	1.023	0.992	0.962
	(0.796)	(0.755)	(0.553)	(0.483)	(0.416)	(0.400)
Parents' Ex. VETL	3.233**	3.193**	2.978**	2.649**	2.647**	2.614**
	(0.686)	(0.675)	(0.605)	(0.538)	(0.546)	(0.544)
Parents' No Ex.	1.172	1.131	1.091	1.014	0.991	0.990
(n=953)	(0.299)	(0.284)	(0.279)	(0.266)	(0.264)	(0.263)
Students' Ex. Secondary	3.279**	3.188**	2.450**	1.904*	1.768+	1.755+
	(0.939)	(0.907)	(0.679)	(0.562)	(0.525)	(0.518)
Students' Ex. VETL	2.587**	2.542**	2.264**	2.157**	2.152**	2.148**
	(0.503)	(0.489)	(0.415)	(0.420)	(0.425)	(0.425)
Students' No Exp.	1.888	1.926+	1.946	1.640	1.579	1.523
(n=953)	(0.749)	(0.763)	(0.795)	(0.601)	(0.627)	(0.643)
<i>Controls</i>						
Student						
Characteristics		X	X	X	X	X
Parents'						
Characteristics			X	X	X	X
Scores				X	X	X
School						
Characteristics					X	X
Distance AESL-						
VESL						X

Note: Coefficients are odds ratios. Significant differences between groups: + p<0.10, * p<0.05, ** p<0.01. Standard errors in parentheses. Each line represents different set of Logit regressions. Every model is clustered at school level.

Table 5B

Assumptions

Estimation	1	2	3	4	5	6
<i>Social capital assumptions</i>						
Pressure towards VESL (n=953)	2.219** (0.189)	2.211** (0.185)	2.101** (0.168)	2.013** (0.156)	1.998** (0.158)	2.014** (0.159)
<i>Risk aversion and discount rate assumptions</i>						
Risk Aversion Rate (N=547)	1.105* (0.050)	1.108* (0.051)	1.108* (0.049)	1.093* (0.048)	1.096+ (0.052)	1.096+ (0.052)
Discount rate (N=944)	0.998 (0.013)	0.997 (0.013)	0.990 (0.013)	0.992 (0.013)	0.994 (0.013)	0.993 (0.013)
<i>Controls</i>						
Student Characteristics		X	X	X	X	X
Parents' Characteristics			X	X	X	X
Scores				X	X	X
School Characteristics					X	X
Distance AESL-VESL						X

Note: Coefficients are odds ratios. Significant differences between groups: + p<0.10, * p<0.05, ** p<0.01. Standard errors in parentheses. Each line represents different set of Logit regressions. Every model is clustered at school level.

All assumptions

When including all assumptions in the model, the coefficients on most variables acted in the same direction, but many of them lost significance. The variables that remained significant for both outcomes were willingness to pay, test scores, expectations of choosing VESL at secondary level, the perceived value of VESL, and the extent of social pressure to attend a VESL

school. Other variables remain significant in most regressions. For instance, females are consistently less likely to express a preference for VESL, probably due to many VESL programs are dominated by men (electricity, mechanical, and agricultural). In the actual enrollment outcome, mother's schooling also appears significant and negatively related to the likelihood of attending a VESL school. Parents' expectations about whether their children will pursue VESL or a VETL degree almost always display a positive and significant relationship with enrollment in VESL. Finally, a preference for entering the labor market directly after completing twelfth grade is strongly and positively related to pursuing a VESL program. This variable may be in part capturing the extent of students' impatience.

My results differ across the two outcomes, survey decisions and actual enrollment. In the first case, coefficients tend to be higher. For instance, the variable "Work after 12th Grade" has a coefficient that is double that when actual enrollment is used as outcome. The same happens for the "Value of VESL/AESL" and "Pressure towards VESL" variables. This suggests that these factors play a key role in the student's decision-making process, but become less important in practice. In fact, when using actual enrollment as an outcome, other variables appear significant, including "Difference in Ranking (R-P)," and more weakly, "Preparation for the Decision" and "Risk Aversion Rate."

Table 6

All assumptions together

Estimation	1	2	3	4	5
HE knowledge	0.876 (0.072)	0.873 (0.073)	0.872 (0.074)	0.893 (0.075)	0.883 (0.085)
Index: Prep. for decision	0.851+ (0.073)	0.875 (0.077)	0.889 (0.079)	0.860+ (0.079)	0.719* (0.099)
Work after 12 th gr.		2.130**	1.875*	1.482	1.451

		(0.515)	(0.479)	(0.376)	(0.497)
Preference: Wage		0.919	0.916	0.872	0.976
		(0.150)	(0.155)	(0.161)	(0.237)
Dif. ranking (R-P)		1.184**	1.141*	1.110	1.144
		(0.077)	(0.074)	(0.074)	(0.108)
Clg. cost concern			0.952	0.835	0.931
			(0.164)	(0.149)	(0.197)
Exp. VESL			2.917**	2.175*	1.863+
			(0.807)	(0.657)	(0.675)
Exp. AESL			0.855	0.662	1.269
			(0.385)	(0.353)	(0.909)
Exp. VETL			2.418**	2.092**	1.428
			(0.523)	(0.462)	(0.384)
No Exp.			0.954	0.926	1.029
			(0.257)	(0.280)	(0.344)
Val. VESL/AESL				1.685**	1.713**
				(0.141)	(0.184)
Pressure to. VESL				1.661**	1.785**
				(0.138)	(0.216)
Discount rate					0.991
					(0.019)
Risk Aversion Rt.					1.126+
					(0.069)
Constant	3.602**	3.337**	2.529**	3.266**	2.988**
	(0.897)	(0.888)	(0.706)	(0.937)	(0.910)
Number of Cases	953	953	953	953	542

Note: Coefficients are odds ratios. Significant differences between groups: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. Standard errors in parentheses. Each line represents different set of Logit regressions. All models controlled by student's, parents', and schools characteristics, test scores and relative distance. Every model is clustered by school.

Multinomial logit regression

When I separated the schools into four groups (public AESL; public VESL; private AESL; and private VESL), it was clear that the effect of the included variables differed across groups. For instance, greater willingness to pay for education was positively correlated with attending a private school but negatively correlated with choosing an academic school, higher scores were related to choosing academic schools, preference for high earnings and concerns about college cost were closely linked to attending an academic school in the public sector, and role of relative distance was most important for students considering or attending a VESL school in the public sector. In addition, expectations about VESL or VETL attendance, the perceived value of VESL, and the pressure to choose a VESL school were more closely related to going to an AESL school.

These results suggest that research about school decisions that only consider the choice between public and private schools could be omitting an important part of how decisions are made, by ignoring the impact of AESL and VESL choices. This means that such research may be accordingly biased.

Table 7
Multinomial logit regression

(N=951)	AESL-Pub	VESL-Pub	AESL-Prv
Female	0.471 (0.321)	-0.229 (0.283)	0.203 (0.241)
Repeating	0.031 (0.395)	0.010 (0.290)	-0.094 (0.277)
Mother Schooling	0.612** (0.172)	-0.005 (0.098)	0.095 (0.109)
Rural	0.265 (0.785)	1.443** (0.424)	1.804** (0.471)

Disposition to pay	0.791** (0.202)	1.055** (0.258)	0.654** (0.101)
Scores 8th	0.315+ (0.170)	-0.194 (0.148)	0.220+ (0.114)
Rltv. distn. AE/VE	-0.153 (0.217)	0.242* (0.099)	0.019 (0.089)
HE knowledge	0.146 (0.141)	0.021 (0.127)	0.087 (0.083)
Ind: Prp for decision	0.216+ (0.124)	-0.052 (0.150)	0.085 (0.097)
Work after 12th grd.	-0.944+ (0.488)	0.202 (0.252)	-0.134 (0.297)
Preference: Wage	0.492+ (0.275)	0.152 (0.223)	0.016 (0.222)
Dif. Ranking (R-P)	-0.066 (0.113)	0.055 (0.120)	-0.119 (0.087)
Coll. cost concern	0.740** (0.269)	0.044 (0.198)	-0.085 (0.202)
Exp. VESL	-0.631 (0.392)	0.409 (0.264)	-0.714* (0.339)
Exp. AESL	1.072 (0.775)	0.067 (0.511)	0.103 (0.561)
Exp. VETL	-1.248** (0.336)	0.110 (0.289)	-0.495+ (0.289)
No Exp.	0.145 (0.392)	0.688* (0.348)	0.160 (0.357)
Val. VESL/AESL	-0.436** (0.123)	0.003 (0.104)	-0.545** (0.106)
Press. to VESL	-0.528** (0.126)	-0.051 (0.139)	-0.512** (0.097)
Constant	-2.858** (0.480)	-2.244** (0.432)	-1.396** (0.345)
Pseudo-R2		0.240	

Note: Coefficients are odds ratios. Significant differences between groups: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$. Standard errors in parentheses. Each line represents different set of regressions. All models controlled by student's, parents', and schools characteristics, also controlled by test scores and relative distance. Every model is clustered by school.

Selected samples⁶

Results were similar to those discussed above. The most important difference was the strong negative relationship between knowledge of higher education and choosing VESL for those with the expectation of a bachelor's degree. For this same group, the preparation index was negatively related to the VESL decision, suggesting that those students with higher education expectations may chose VESL as a result of having invested less time in making this decision. In addition, the variable that measures the gap between students' actual and perceived performance was positively correlated with choosing VESL for this group.

Discussion

Results provide support for most of the hypotheses presented above. In particular, SES, cultural, social and self-image factors seem to be closely related to the school-career choice. When trying to understand why some high-performing low-SES students may choose VESL, the answer could be in part a function of an environment that highly values VESL. The concept of habitus (Bourdieu, 1998) plays an important role here. Parents might be advising their children based on their own experiences that may not necessarily mirror current realities about higher education and the labor market. Other variables support the hypothesis that cultural elements are important. For instance, expectations play a central role in shaping decisions. The finding that students whose parents expect them to attend VE at tertiary level are choosing VESL schools is also interesting. In addition, those eighth graders thinking of entering the labor market immediately after the twelfth

grade choose a vocational school with greater probability. Therefore, it seems that cultural beliefs are integral to students' decision-making processes. These results do not allow me to explore the question of whether these beliefs are rational; however this may be an important part of the puzzle. It could also be the case that cultural beliefs underlie preferences, such that students could be choosing their careers rationally but on the basis of different preferences. A third and preferred alternative is that culture, networks and proximity create bounds that may prevent students from appreciating the full range of educational alternatives available to them. In this case, they make decisions under conditions of bounded rationality (McDonough, 1997). Further research is needed to increase the precision and the robustness of this analysis.

These results also highlight the problem of social reproduction. Because socioeconomic and cultural factors influence decisions, and these decisions affect future opportunities, it seems highly likely that the educational system could be contributing to the reproduction of SES patterns over time. High levels of inequality and segregation among the population in Santiago may increase the likelihood that poor students both live and attend school with people who share similar beliefs and varieties of capital (human, cultural and social). The homogenization of expectations and beliefs across similar SES students could increase the risk of reproduction of inequalities (Hao & Bonstead-Bruns, 1998).

Results also raise questions about the kind of policies that could be effective in reducing the effects of cultural and social factors on educational outcomes. Since many of these factors could be deeply embedded in cultural traditions and beliefs, policies addressing these issues need to be framed as long-term interventions. Schools clearly have an important role to play (Bowen *et al.*, 2009). For instance, policies that promote the provision of information about higher education, and attempt to adapt cultural beliefs could be pertinent. Although there is evidence that information could affect decisions (Hastings *et al.*, 2006), it is highly likely that policies intended to

increase the circulation of information in the short-term will affect only part of the population. Change needs to begin early, since many educational decisions that affect future opportunities may be made as early as primary or the beginning of secondary school (Bozick *et al.*, 2010).

Finally, it is worth considering that equal opportunities in education do not depend only on providing an equally challenging curriculum to all students, but are also a function of personal effort and personal decisions. This research suggests that personal decisions may in turn be influenced by SES and cultural factors. Accordingly, policymakers also need to make an effort to address differences in the factors that affect the quality of students' decisions.

Notes

¹ I am thankful to the Chilean Ministry of Education and the Centro de Estudios for all the support and information provided. I appreciate the financial support I received from the Stanford Center for Education and Policy Analysis, the Centro de Estudios de Políticas y Prácticas en Educación de la Pontificia Universidad Católica de Chile, and the Stanford University School of Education Dissertation Support Grant. Typical disclaimers apply.

² Bounded rationality “refers to behavior that is rational but limited by the cognitive constraints on decision making” (McDonough, 1997, p.10).

³ Akerlof & Kranton (2010) introduced the concept of “identity economics” arguing that “who we are” shapes our work, wages and well-being.

⁴ These two reasons are the primary and secondary effects articulated by Boudon (1974). These may be related to cultural factors that may limit the capacity of low-SES students to fully appreciate the differentials in rates of return to tertiary education.

⁵ In addition, operational factors, such as low parental response rates or survey logistics, influenced my decision.

⁶ Results available by request.

References

- Akerlof, G. A. & Kranton, R. E. (2010). *Identity economics how our identities shape our work, wages, and well-being*. Princeton: Princeton University Press.
- Arancibia, V. (1994). La educación en Chile: percepciones de la opinión pública y de expertos. *Estudios Públicos*, 54. CEP. Chile.

- Ascher, C., Frucher, N., & Berne, R. (1996). *Hard lessons: public schools and privatization*. New York: The Twentieth Century Fund Press.
- Bassi, M. & Galiani, S. (2010) *Labor market insertion of young adults in Chile*. Presentation at Sociedad de Políticas Públicas, Chile.
- Beattie, I.R. (2002). Are all "Adolescent Econometricians" created equal? Racial, class, and gender differences in college enrollment. *Sociology of Education*, 75(1), 19-43.
- Becker, G. S. (1964). *Human capital*. New York: National Bureau of Economic Research.
- Blossfeld, H.P., & Shavit, Y. (2000). Persisting barriers: Changes in educational opportunities. In Arum, R. & Beattie (eds.), *The structure of schooling*. Mountain View: Mayfield.
- Bourdieu, P. & Passeron, J. C. (1977). *Reproduction in education, society and culture*. Beverly Hills: Sage.
- Bourdieu, P. (1986). The forms of capital. In John G. Richardson (ed.), *Handbook of theory and research for the sociology of education* (pp. 241-258). New York: Greenwood.
- Bourdieu, P. (1998). *Practical reason*. Stanford: Stanford University Press.
- Bosetti, L. (2004). Determinants of school choice: Understanding how parents choose elementary schools in Alberta. *Journal of Education Policy* 19(4), 387-405. DOI:[10.1080/0268093042000227465](https://doi.org/10.1080/0268093042000227465).
- Boudon, R. (1974). *Education, opportunity, and social inequality*. Hoboken; John Wiley & Sons.
- Bowen, W. G., Chingos, M. M., & McPherson, M. S. (2009). *Crossing the finish line: completing college at America's public universities*. Princeton: Princeton University Press.
- Bozick, R., Alexander, K., Entwisle, D., Dauber, S. & Kerr, K. (2010). Framing the future: Revisiting the place of educational expectations in status attainment. *Social Forces*, 88(5), 2027-2052. DOI: [10.1353/sof.2010.0033](https://doi.org/10.1353/sof.2010.0033).

- Brown, Duaine & Associates. (2002). *Career choice and development*. Fourth Edition. San Francisco: Jossey-Bass.
- Cáceres, C. & Bobenrieth, E. (1994). Un modelo de selección de liceos de enseñanza media. *Cuadernos de Economía*. Pontificia Universidad Católica de Chile. N° 92.
- Carneiro, P. & Heckman, J.J. (2002). The evidence on credit constraints in post-secondary schooling. *The Economic Journal*, 112(482), 705-734.
- Carnoy, M. (2007). *Cuba's academic advantage*. Stanford University Press. Stanford, California.
- Chubb, J. E. & Moe, T. M. (1990). *Politics, markets, and America's schools*, Washington, D.C., Brookings Institution.
- Chumacero, R. A., Gómez, D. & Paredes, R. (2011). I would walk 500 miles (if it paid): Vouchers and school choice in Chile. *Economics of Education Review*, 30(5), 1103-1114. DOI: [10.1016/j.econedurev.2011.05.015](https://doi.org/10.1016/j.econedurev.2011.05.015)
- Coleman, J. (1988). Social capital in the creation of human capital. *American Journal of Sociology* 94, Supplement: S95-S120.
- De Iruarizaga, F. (2009). *Dos miradas a la educación media en Chile*. Tesis de Magister. Pontificia Universidad Católica de Chile
- DiMaggio, P. (1982). Cultural capital and school success: The impact of status culture participation on the grades of U.S. High school students. *American Sociological Review* 47(2): 189-201.
- Enersen, D.L., Servaty-Seib, H.L., Pistilli, M.D. & Koch, A.K. (2008). Twenty-first century scholars, their parents and guardians, and the sites that serve them. *Purdue University*.
- Erikson, R. & Rudolphi, F. (2010). Change in social selection to upper secondary school — primary and secondary effects in Sweden. *European Sociological Review*, 26, 291-305. DOI: [10.1093/esr/jcp022](https://doi.org/10.1093/esr/jcp022).

- Farias, M. & Carrasco, R. (2012). Diferencias en resultados académicos entre la educación media técnico profesional y humanista científica en Chile. *Revista Calidad en la educación*, 36
- Gallego, F. & Hernando, A. (2009). School choice in Chile: Looking at the demand side. Mimeo.
- Gao, L. (2011). *Impacts of cultural capital on student college choice process in China*. Lexington Books. United Kingdom.
- González, J. (2011). Baja participación en educación superior: Hallazgos en la toma de decisiones de los jóvenes de menor nivel socioeconómico. Centro de Estudios de Políticas y Prácticas en Educación. *Notas para Educación*, No 8.
- Halpern, D. (2005) *Social capital*. Cambridge: Polity Press.
- Hao, L. & Bonstead-Bruns, M. (1998). Parent-child differences in educational expectations and the academic achievement of immigrant and native students. *Sociology of Education*, 71(3), 175-198.
- Hastings, J., Kane, T., & Staiger, D. (2006). Parental preferences and school competition: Evidence from a public school choice program. Working Paper 11805. *NBER*.
- Hearn, J. (1984). The relative roles of academic ascribed and socioeconomic characteristics in college destinations. *Sociology of Education*, 57, 22–30.
- Jussim, L., & Eccles, J. S. (1992). Teacher expectations: II. Construction and reflection of student achievement. *Journal of Personality and Social Psychology*, 63, 947-961.
- Kirst, M. & Venezia, A. (2004). *From high school to college. Improving opportunities for success in postsecondary education*. San Francisco: Jossey-Bass.
- Loeb, S. & Klasik, D. (2010). Career-Related education: The human capital investment decisions of individuals. Manuscript. Stanford University.

- Manski, C.F. (1989). Education, schooling as experimentation: Reappraisal of the post secondary dropout phenomenon. *Economics of Education Review* 8: 305-12.
- Mare, R. D. (1980). Social background and school continuation decisions. *Journal of the American Statistical Association*, 75, 295-305.
- McDonough, P. (1997). Choosing colleges. How social class and schools structure opportunity. New York: *State University of New York Press*.
- Microdatos, Universidad de Chile (2009). Encuesta de seguimiento a egresados de la enseñanza media técnico profesional cohorte 2003.
- Putnam, R. D. (1994). Making democracy work. Princeton: Princeton University Press.
- Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy* 6 (1): 65–78.
- Roderick, M., Nagaoka, J., Coca, V., Moeller, E., Roddie, K., Gilliam, J., & Patton, D. (2008). From high school to the future: Potholes on the road to college. *The University of Chicago Consortium on Chicago School Research*.
- Sacerdote, B. & Marmaros, B. (2005). How Do Friendships Form? *NBER Working Paper No 11530*.
- Sallie Mae Fund. (2003). Strengthening our commitment to access: national consumer study of parent and student financial aid awareness. Unpublished.
- Saporito, S. & Lareau, A. (1999). School selection as a process: The multiple dimensions of race in framing educational choice. *Social Problems* 46(3): 418-439.
- Shapiro, J. M. (2005). Is there a daily discount rate? Evidence from the food stamp nutrition cycle. *Journal of Public Economics, Elsevier*, vol. 89(2-3), pages 303-325, February. DOI: [10.1016/j.jpubeco.2004.05.003](https://doi.org/10.1016/j.jpubeco.2004.05.003).

- Schneider, M., Elacqua, G., & Buckley, J. (2006). School choice in Chile: Is it class or the classroom? *Journal of Policy Analysis and Management*, 25(3), 577-601. DOI: [10.1002/pam.20192](https://doi.org/10.1002/pam.20192)
- Schultz, T. W. (1963). The economic value of education. New York: *Columbia University Press*.
- St. John, E., Hu, S. & Fisher, A. (2011). Breaking through the access barrier: How academic capital formation can improve policy in higher education. *Routledge. New York*.
- Tedin, K. L. & Weiher, G. R. (2004). Racial/ethnic diversity and academic quality as components of school choice. *Journal of Politics*, 66(4), 1109-1133.
- Tolsma, J., Need, A & de Jong, U. (2010). Explaining participation differentials in Dutch higher education: the impact of subjective success probabilities on level choice and field choice. *European Sociological Review*, 26 (2), 235-252. DOI: [10.1093/esr/jcp061](https://doi.org/10.1093/esr/jcp061)
- Usher, A. (2005). A little knowledge is a dangerous thing: how perceptions of costs and benefits affect access to education. *Toronto: Educational Policy Institute*.
- Usher, A. (2006). Grants for students: What they do, Why they work. *Toronto: Educational Policy Institute*.
- Weiher, G. R. & Tedin, K.L. (2002). Does choice lead to racially distinctive schools? Charter schools and household preferences. *Journal of Policy Analysis and Management*, 21(1), 79-92. DOI: [10.1002/pam.1041](https://doi.org/10.1002/pam.1041)
- Yonezawa, S., Wells, A. S. & Serna, I. (2002). Choosing tracks: "Freedom of choice" in detracking schools. *American Educational Research Journal*, 39(1), 37-67. DOI: [10.3102/00028312039001037](https://doi.org/10.3102/00028312039001037)

Mauricio Farias is Senior Researcher at Fundación Chile. He is Ph.D in Education by the Stanford Graduate School of Education.

Contact Address: Estadio 570, Recoleta, Santiago, Chile.
 Correo electrónico: mauricio_farias@yahoo.com
 Twitter: @mfarias13

Unequal Partnerships in Higher Education: Pedagogic Innovations in an Electronics within Physics Degree Course

Maddalena Taras
University of Sunderland

Francisco M. Gómez
University of Granada

Juan B. Roldán
University of Granada

Abstract

This cross-European research partnership reports on supporting pro-active learning and teaching. The two-part project firstly explored student beliefs about electronics within a physics degree and secondly, the use of peer assessment of a *Mathematica* notebook to develop understandings of standards and quality. Student beliefs were explored because of the negative perceptions tutors thought students brought to the Engineering course within the Physics degree. The results showed that tutors' fears were unfounded and that the students were highly motivated. Secondly, through peer assessment of a notebook, students developed critical understandings of standards and quality. Generally, students valued the content support and appreciated both the work of their peer and how this helped their own understanding.

Keywords: partnership, Europe, assessment, student beliefs



Partenariados Desiguales en la Educación Superior: Innovaciones Pedagógicas en el campo de la Electrónica en el Grado de Física

Maddalena Taras
University of Sunderland

Francisco M. Gómez
University of Granada

Juan B. Roldán
University of Granada

Resumen

Esta investigación realizada por un partenariado transeuropeo se centra en el apoyo proactivo de la enseñanza y el aprendizaje en la educación superior. Este proyecto consta de dos partes. Primero se exploraron las creencias de los estudiantes sobre la electrónica en el grado de Física para, después, usar la evaluación por pares del manual *Mathematica* para desarrollar la comprensión de los estándares y calidad. Las creencias de los estudiantes se exploraron teniendo en cuenta las percepciones negativas que los tutores pensaban que tenían los estudiantes del curso de Ingeniería en el grado de Física. Los resultados destacaron que los miedos de los tutores eran infundados y que los estudiantes se mostraban altamente motivados. Segundo, a través de la evaluación a pares del manual, el alumnado desarrolló una comprensión crítica de los estándares y su calidad. Generalmente, el alumnado valoró el apoyo sobre el contenido y apreció tanto el trabajo de sus compañeros y como éste les había ayudado en su comprensión.

Palabras clave: partenariados, Europa, evaluación, creencias del alumnado



This paper reports the research developed within a cross-European partnership between English and Spanish academics working within different subject areas and disciplines. The rationale is explained as is the context and support from the literature.

Originally this project was conceived to develop students' involvement and participation in assessment in order to develop students as partners in learning in higher education (HE) and increase their independence and autonomy: this became the second part of the research. However, during the discussions while developing the project, it became clear that the tutors of the Spanish university were very concerned about their students' perceived negative beliefs about the electronics component within the physics degree. The level of concern was deemed high enough to warrant the decision to explore why it was that students had such a negative opinion of electronics: this became the first part of the research.

Project Context

This paper reports a collaborative research partnership between academics working in a southern Spanish University and an academic working in the north east of England. The Bologna agreement has rationalised and promoted the importance of cross European understandings, collaborations, equivalences and parities in educational processes and outcomes. This paper reports a success story of a collaboration which supports the Bologna principles and aims.

The academics participating in this study met at a European education conference and subsequent to the Spanish academics' presentation of supporting students in creating notebooks. The Spanish team, not being experts in research on learning and teaching in HE, felt that they could not continue their learning research, but discussions led to a decision to work

together. Considering that it would be pity that the lack of experience should curtail such enthusiasm and energy in the desire to explore learning and teaching, she offered to support future developments. Although having no understanding of their subject, the UK lecturer volunteered her greater expertise in learning and teaching to explore how their innovation could continue and what could be appropriate. And so an international collaborative project was born.

Communication is central to all aspects of educational development and the first decision which the researchers had to make was how this process would take place. Although email was used to send documents and ideas, most of the strategies and decisions for and during this research were negotiated and discussed via Skype. This was a very efficient medium which permitted clarification of many if not all areas of misunderstanding. Clarification would have been much more difficult and time consuming had it all been done through written emails for example.

Their complementary expertise provided a balanced dynamic, with a lot of synergy to exploit. So, a joint strategy was designed. This involved much from both camps both in subject discussions and in process implementation.

Research Context

The original aims and discussions to work together were based on a desire to build upon the previous year's work which had supported students in creation of their own *Mathematica* (a commercial software to simplify performing complex calculations) notebooks in order to provide teaching materials for other students but also to develop their own personal expertise during the process (Taras *et al.*, 2010).

However, during discussions into how best to organize the work and select the students for this research, it became clear that the Spanish tutors were very concerned about another aspect pertaining to their work in

supporting their Physics degree students in this obligatory Electronics module.

Good, efficient support of learning has as a premise an understanding of learner needs and beliefs at a number of basic levels: one of these often neglected aspects is learner beliefs concerning the subject (Prosser and Trigwell 1999). The Spanish tutors were convinced that the students had not understood the value and primacy of electronics in their Physics degree: this they believed was a handicap for them and their students as the latter would be less motivated and view their module as less important than their other Physics modules. A consequence of this belief was that the tutors would devote considerable time and effort, particularly in the first weeks of their course, to convincing students of the centrality of Electronics for Physics. They saw this as valuable time wasted which could have been used to support learning.

Therefore, the research project was divided into two parts: firstly, to explore the students' perceptions of the importance of the electronics component of the physics degree and by understanding why to find strategies to counteract these beliefs and secondly, to develop the evaluative skills of students by using 'notebooks' developed by previous year's students.

Learning, teaching and assessment beliefs

The principle of seeing students as instruments in their own learning is in accordance with current theories of learning and teaching which move beyond the metaphor of transfer of learning into an empty vessel (Hager and Hodkinson 2009; James 2006). The complex and individual nature of personal experiences, contextual differences and anomalies in shared understandings further mitigates against a limited and narrow view of learning particularly in a HE context where we are dealing with adult and experienced learners (Haggis 2009, Dysthe 2008). In order to conceptualize

an inclusive and ethical learning, teaching and assessment process which is in accordance with current thinking, learners should be an integral part of an aligned curriculum and decisions pertaining to it (McArthur and Huxham 2013).

Therefore, this paper is placed squarely within beliefs that learning, teaching and assessment are part of a communicative, dialogic and learner inclusive view of ethical and inclusive pedagogy. Within this interrelated and aligned view of pedagogy, there is also the observation that it is often assessment practices which are excluded and sidelined within pedagogy as they are often still seen as the exclusive preserve of tutors (Taras 2010, Tan 2009, Nicol and McFarlane-Dick 2005, Rust et al 2005).

Contextual Background

This research is considered particularly appropriate in the context of this electronics-within-a-Physics degree in a Spanish university course. However, the general principles of exploring student beliefs and developing their evaluative skills are relevant for all subject areas in different contexts.

It was felt that the attitude of the majority of the students at the Spanish university in the first electronics course which is a mandatory element in the Physics degree was not only passive, but lacked interest and motivation. Staff believed that students did not value the importance of electronics for physics, particularly as some of the students in previous years had complained that this subject is not included in similar degrees in other universities. Electronics is a complex topic that is considered to be at the boundary of the contents that typically belong to a physics degree. Consequently, their motivation in relation to electronics was felt to be generally low (Prosser and Trigwell 1999).

In order to change this, a set of tasks were developed to create a proactive response. Therefore, during the first year of implementing these tasks, it was proposed to develop the programming of notebooks in *Mathematica*

to implement students' analytic capacities and perform the calculations needed to describe the electronic devices explained in the course. This was not an obligatory activity and to 'reward' students 2 points on a 10 point scale were awarded to the final qualification mark. This research was successful, and more students than expected wanted to be involved (Taras *et al.* 2010). Sixteen groups asked to participate making a total of 33 students. From these, ten groups (21 students) completed the task. All the groups had two members except one having three. This produced additional teaching material for future use. The following year it was thought that it would be interesting to use the notebooks in class as teaching material.

Since the notebooks were a new teaching tool it was felt that their assessment by the new students would be interesting as it would help develop pro-active, agentic learners (Taras 2013, Tan 2009). Taylor and Robinson (2009). It was in this context that the Spanish lecturers got in touch with their colleague from the UK who agreed to help them in setting up the peer and self-assessment processes.

Research Aims

This project has two aims within an electronics engineering course: firstly, it asks why students of physics undervalue the obligatory electronics component of the physics degree, when the staff believe it is central to the fundamental and basic understandings to support the degree: also, where do students' erroneous beliefs have their origin. Staff felt that every year they waste valuable time and energy convincing students of the importance of the electronics component. Therefore, a deeper understanding of the why will be an important means of resolving this issue.

Secondly, staff wished to develop the evaluative skills of students by using the best notebook developed by the previous year's students. By focusing on the evaluation of this notebook, the aims are to develop both peer assessment of students' work and also self-assessment by students of

how this evaluative experience impacts on their own understandings and learning journeys (Havnes and McDowell 2008).

Project Part 1

The first part of the research has the following objectives:

1. to explore the students' perceptions of the importance of the electronics component of the physics degree because the staff believe students think it has little value when they think it is central
2. to build on students' understandings of the subject in order to convince them of the central importance of the electronics component of the physics degree

It focuses on two research questions:

1. What are the students' perceptions of the importance of the electronics component of the Physics degree?
2. What are the students' understandings of the subject in order to convince them of the central importance of the electronics component of the physics degree?

Research Method

A questionnaire (Appendix 1) was developed to help students reflect on their understandings and opinions of the importance of the electronics component of the physics degree. The answering of this questionnaire was obligatory, completed in class and took approximately half-an-hour to complete. It was in English although also translated into Spanish.

These data provided both qualitative and quantifiable data concerning student' views on electronics in general and the course they were about to follow in particular. It will also permit the tutors to adapt their initial teaching weeks to focus on the issues discovered.

Student details

The respondents in the study were two groups of students in their fourth year of a physics degree. The total number of students was 57 and they were divided equally into about 30 students in each group. More than half of the students are new to electronics. Approximately 30-40% of them could have had experience of subjects connected to electronics because either they were repeating the course or they had transferred from other degrees, such as electronics engineering or telecommunication engineering (this latter case is the less common).

Electronics is taught in the fourth year of a five-year physics degree. This subject is complex since several of the topics explained in the previous years in the degree are involved (thermodynamics, electromagnetism, statistical mechanics, quantum physics, etc.). Electronics has obviously an engineering approach to the content since the link to the microelectronics industry is very important. This approach is completely new for the students of physics, and therefore, paves their way with difficulties derived from a technology oriented viewpoint.

Questionnaire Results**A.- Questionnaire to analyse students' opinions on the inclusion of an electronics course within the physics degree.**

This section of the project presents the data collected from the questionnaire ([Appendix 1](#)) which reflect students' understandings and opinions of the importance of the electronics component of the physics degree. The percentage number of students answering the questionnaire was 61% (35 students of 57) and answers are as follows.

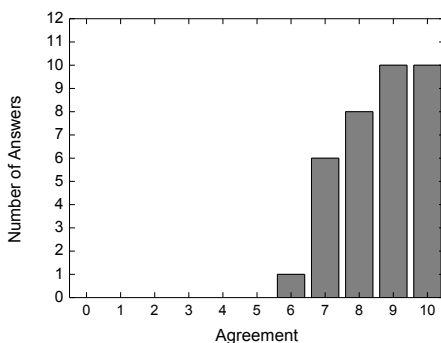
Question 1. Have you ever followed a course in electronics before?

The first item in the questionnaire was related to the students' previous knowledge of electronics and the results show that students in the course studying electronics for the first time were 68% and 32% had studied it previously.

In this section, unless otherwise stated, the results refer to 35 students answering and they show the number of answers for each student level of agreement. In the qualitative data, citations of individual students are reported within quotation marks (“...”). At the end of the citation, the numbers in brackets represent the level of agreement; therefore, (8/10) means the student agreed at the level 8 out of a possible 10.

Question 2. Explain what you think is the importance of electronics for society.

Regarding question 2, the students assessed very highly the importance of electronics for society. Graph 1 shows the bar chart with the data, and it is clear that all the students attached a high degree of importance to electronics and its importance for society.



Graph 1. Importance of electronics in society for Physics students.

In the comments, 20 out of 35 pointed out the importance of electronics for the technological development of society, or to understand the way current technology works.

“Technology is everywhere in our society” (6/10).

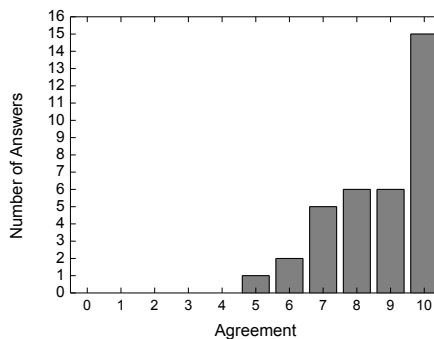
“The way society is structured, electronics plays a fundamental role in our environment. Thousands of electronic devices make our life easy” (8/10).

“Electronics is essential for society, since all the technological developments in the second half of the 20th century were based on the improvement of electronics” (10/10).

“It's very important because most of modern devices are electronic ones. Also it is necessary for computation, which is the coolest thing designed by humankind” (10/10).

Question 3. Explain what you think is the importance of physics for society.

Question 3 dealt with the interest of physics for society. Similar results were found. In this case the highest mark was given more times than in the previous question, 43% (15/35) answered “10”, and the spread of the data was slightly higher.



Graph 2. Importance of Physics for society for Physics students.

Students argued about the importance of physics for society not only for the technological process, but also in fields such as energy efficient production and uses, and the understanding of the behaviour of the natural world. It was clear from this question that they think physics could solve not only technological problems, but also to act as a perspective from where humankind can see its entire existence. A slightly greater interest in physics as a whole is perceived in comparison with electronics.

“[Physics] allows us to satisfy human beings’ wish for knowledge, and in some cases this is useful for our welfare” (6/10).

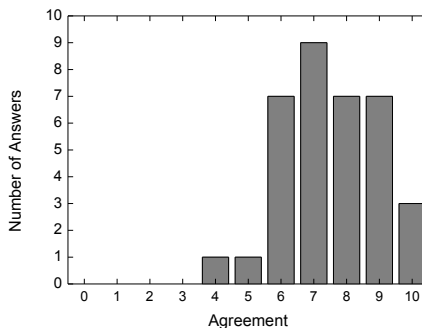
“Physics gives an explanation for everything we observe even though we are not aware of it” (8/10).

“For instance, one of the main issues for society nowadays is the lack of energy resources, and this is a topic studied by physics. With this, I say everything” (10/10).

It is interesting to see the differences between the results obtained in questions 2 and 3. The students considered that physics is more important for society than electronics, although the differences were not paramount. This difference may have several interpretations: i) students might be indicating that they consider electronics as an interesting topic, but physics it is more important for society just on the grounds on their personal interest (they study physics, not electronics. Probably students in the electronic degree would think the contrary); ii) students might be indicating that they really consider electronics as a part of physics, so question number 3 includes implicitly question number 2, and therefore the marks of the whole field (physics) are higher than a section of it (electronics); iii) they might be considering that electronics is a completely different topic, but still important for society. In accordance to the rest of the answers in the questionnaires we think the reasons behind these results are decreasing in likelihood from i) to iii).

Question 4. To what degree do you consider a physicist needs a background in electronics. Explain this please.

Question 4 tried to look into the connection they could find with their studies and electronics. The results are depicted in Graph 3. The higher spread in the results gives the impression of a diversity of opinions on this point. Not everybody agrees to the same degree on this issue, although they all concluded that knowledge of electronics is relevant for a physicist. Few answers were below 6 in the degree of agreement, just 6% (2/35).



Graph 3. Importance of electronics background for a physicist.

In the qualitative data they argue that electronics is necessary, one even says that a physicist should know a little bit of everything (why not electronics?). Some of them declare that having a background in electronics is useful in order to find a future job. There are also comments about the need to know how the measurement equipments actually work, since most of them are based on electronics, and a physicist definitively needs to use them for experimental tasks. However, this last issue does not appear very frequently in the answers. (11 people argued this from the total 35) They mostly think of electronics as related to engineering, learned mainly with the purpose of developing new devices, but not with the purpose of understanding measurement processes.

“It depends on what the physicist is going to work in. But it's useful” (5/10).

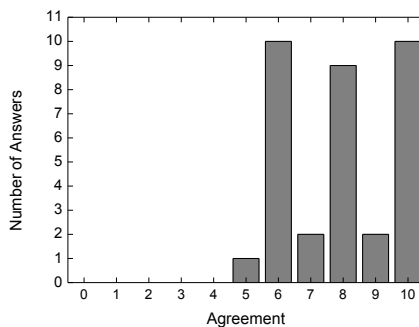
“Physics is wide enough to consider it absolutely indispensable to know electronics. I have marked it with a 7 since I do consider it necessary to have a basis in electronics” (7/10).

“A physicist needs a strong background in electronics because working in a lab, using detectors for experiments require a knowledge of basic electronics” (9/10).

Question 5. To what degree do you consider electronics is a part of physics. Explain this please.

The results had a relative high dispersion in the answers, as shown in Graph 4. Further, 34 students answered instead of 35, showing that not everybody has an opinion or are sure about this. There are three dominant sets of answers: one agreeing with the highest mark of 10 (29.4% of the students, 10/34), a second one assigning 8 (26.5% of the students, 9/34), and a third one of equal importance to the first with just 6 (29.4% of the students, 10/34). These results could be explained because electronics is a discipline in itself.

There are degrees where students learn about concepts of electronics without paying special attention to the physics from which they originate (mainly in engineering). This may have led to the students of the last group thinking that electronics is something different to physics. The fact is that electronics arose from physics, and there are many fields (quantum electronics, for example) that are purely physics and are not suitable to be included in the current engineering curriculum. This is probably the reason why about a third of the students gave an answer of 10.



Graph 4. Agreement with electronics being a part of physics for physics students.

They think electronics is a part of physics, but their feeling is that electronics has become a completely new discipline, so it should be considered as a new field. Other students think electronics is in fact an important part of physics, although not basic physics.

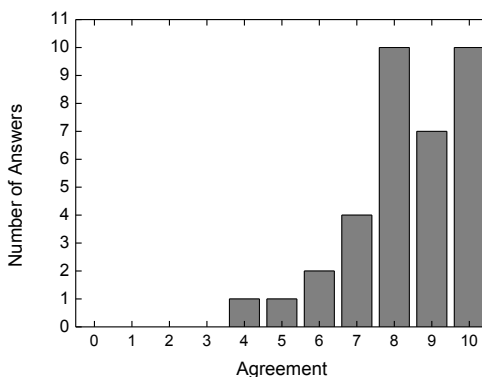
“It is really important as a part of it [physics]. However, I think they are very dissimilar entities, so it is hard to study them at the same time” (6/10).

“Electronics, as far as I know, derives from physics. Electronic engineers require solid backgrounds in physics to understand their field. Nevertheless, electronics have grown so much in the last decades, so it could be considered as an independent field, we should not forget its basis and foundations though” (8/10).

“I consider all progress in electronics is based on basic physics ideas. For example, you need to understand the basics of a semiconductor in order to apply it to the electronic industry” (10/10).

Question 6. To what degree do you think that research in physics should be theoretical. Explain this please.

The results are depicted in Graph 5. 77% of the answers (27/35), that is, most of them were above 7.



Graph 5. Degree of importance of theoretical research in physics for physics students.

They argue that theory is the tool to guide the development of research: the difficulties of doing an experiment with no knowledge of “what is going on” within the physical systems illustrate the centrality of theory. Some students assert that “when you know what you should look for, it is easier to find it”, where theoretical knowledge is crucial. However, students also believe that theory alone is not sufficient but that it has to be intertwined with experimental research so that they support each other. They also comment that sometimes theory goes far beyond the real world, looking like a mathematical map.

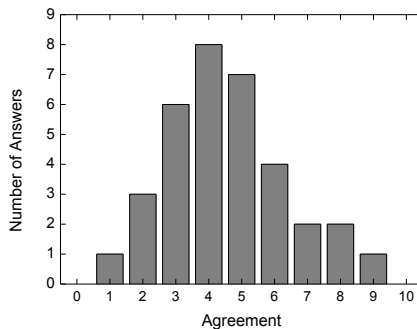
“We can't have theoretical research without experimental research” (4/10).

“Theoretical research is the basis. It is, therefore, very important. Nevertheless it requires experience to obtain its formal structure” (8/10).

“Basic research plays a fundamental role in development of new technologies” (10/10).

Question 7. Do you think that there is a balance between theory and practice in physics? Explain this please.

Question 7 was the lowest assessed item and the results are depicted in Graph 6. It is also the one with the biggest spread, demonstrating a high diversity of opinions. Moreover, not everybody answered this question. The balance between theory and practice is an issue that should be considered, since a high percentage of the students (53% marked below 5, 18/34) seem to be disappointed with the way the connection is made.



Graph 6. Opinion about the balance between theory and practices in the physics degree.

Students do not think there is the right balance between theory and practice in the physics degree as a whole and the electronics course in particular. Further, the high spread in the results show a lack of agreement between them. They are more critical on this issue, and the most repeated arguments are the lack of coordination between practical work and theory (they claim that sometimes they have to carry out practices for what they do not know the theory), and the existence of irrelevant practices where they do not learn anything. The few critical opinions argue that theoretical physics is a consequence of experimental physics, so practices should also be relevant

within the degree, and others suggest that practices should be carried out in companies, or far away from the academic field.

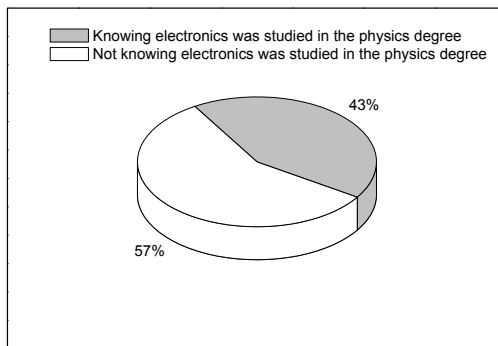
“My personal experience tells me that the theoretical aspects are more emphasized in the studies, and I think we should change the policies and spend more time on the practical aspects” (1/10) .

“Usually, some physics courses have practicals. However, not many of them give the practicals the importance they deserve. Also, many times students have a lab lesson before they learned that in theory class” (4/10).

“I figure out that all we study nowadays in a theoretical way is to be applied in practical situations.” (8/10).

Question 8. When you chose to do a degree in physics did you know you would be studying electronics?

Most of the students did not know that electronics was studied within the degree. This is probably connected to the results from question 5, about the relevance of electronics within physics. The wide spread of the data might be due to the fact that most of the students did not expect electronics to be a compulsory part of their studies.



Graph 7. Percentages of students knowing from their first year that electronics was studied in the physics degree (grey) and not knowing it (white).

Question 9. What is your opinion of having an obligatory electronics component in your physics degree?

Finally, in question 9, students comment on whether they agree with the inclusion of electronics within the physics degree. A wide spectrum of answers was found and it is not possible to quantify them as in the previous ones. Nevertheless most of the answers were positive about this item, and the following quotes indicate trends. In general they believe it is good for their curricula and would not exclude it from the degree.

- "I personally do not like electronics, and I'm not good at it. So I struggle with it, especially in practical sessions. However I consider it is interesting to have basic foundations (at least) on electronics. Moreover we may need them when we graduate since physics is such a versatile degree that we do not know the professional field we are going to end working on".
- "Electronics is necessary for any current scientist from my point of view, so I agree on it being an obligatory subject".

- “When I started my studies I did not understand this point well, but as I progress on my degree I realized its importance for the Physics of today”.
- “I think it is ok as it is now. Following the assessment I carried out in the above items, I think a physicist must have a base in electronics”.

Discussion

As noted above, the staff believed that students attached little value to this electronics course when in reality they think it is central to the Physics degree. Staff had been frustrated because they had felt that a considerable time of the first sessions had been wasted in convincing students when they should know this already.

From the data it is clear that tutors had been mistaken about students’ beliefs and understandings of the importance of electronics both for physics and for society. From Question 2 which asks of the importance of electronics for society, both the quantitative and the qualitative data clearly indicate that students all rated the importance of electronics highly for society: they highlighted how electronics had facilitated and improved social functions and communications. In Question 3, they show that they believe that physics has enabled humanity to understand fundamental principles and will enable us to deal with current and future problems on a global scale and therefore that physics is valued somewhat more highly than electronics.

It is however in examining Questions 4 and 5 that we come to answering the crux of the concern which originally troubled lecturers: these two questions explore the relationship between electronics and physics. As noted in the results, both Questions 4 and 5 showed the widest spread of results indicating that this is the area where there is the greatest difference of opinions. Although there are evident links between the two subjects, given the variety of specialisms within each subject area and the relative dependence of each specialism to the other subject, it is not surprising that students relate their requirements to their own personal futures and needs

when considering the link. Which aspects of physics are of particular interest to them and their own past experiences are also important factors for them as noted in the qualitative responses. Finally, Question 8 indicates that most of the students were not aware that there would be an electronics course, even less an obligatory one, as an integral part of the physics degree. Managing student expectations is an important aspect of understanding their thinking and reactions.

In addition to the questions exploring student beliefs about electronics and physics, they were asked two questions (6 and 7) about theory and practice in their physics degree. These questions were added after discussions between the researchers in Spain who were explaining the electronics component to the English academic. The latter wondered whether the highly theoretical aspect of the electronics course was a factor, and because of her own personal interest in theory, was keen to explore students' beliefs. The results of these questions are a good indication that there had been excellent communication and a sharing of understandings of the issues involved in the course being researched between Spain and England. These questions produced interesting results. 77% of the answers were above 6 thus indicating that theory is very important to research in physics, however, it is tempered by the understanding that theory and empirical research should go hand in hand in order to inform each other.

Question 7 produces the most polemical results in that firstly, it was the lowest assessed item and secondly, the question with the widest spread and thus the highest diversity of opinion. In addition a high number were dissatisfied with the balance between theory and practice taught on the physics course. Knowing about and understanding where there is dissatisfaction in students is a very important aspect of any course because it reflects good communication with students and also provides pertinent feedback for the future.

Project part 2

The use of peer assessment of a notebook to develop understandings of standards and quality

The second part of the research has the following objectives:

1. To develop the evaluative skills of students by using a ‘notebook’ developed by previous year’s students
2. To develop both peer and self-assessment in students
3. To use the notebook to better understand the physics of the electronic devices described in the course and get familiar with the common physical quantities (voltage, current, etc).

Research Method

The best *Mathematica* notebook was selected from eight produced by previous students. This was provided to the 15 students who volunteered to participate along with an explanation sheet (see section 2 below). The work and how this would support their learning were explained. The questions to be answered were written and explained in class. We were especially interested in evaluating the usefulness of the notebook for these students. The students were asked to evaluate the usefulness of the notebook (as product) and also, to evaluate the usefulness of using the notebook (as a process for checking the different parameters) (see section 2c).

To take part in this activity each student sent an email to their tutor asking to participate. Then, the tutor replied providing general instructions about the activity (common information for all the students), providing input numbers to be used in the notebook (a different set of input values for each student, to avoid copying results from other students and to promote discussion between them), and finally the items that the students should consider to do this activity (common items for all the students).

Student details

The activity carried out in project Part 2 was not compulsory. Therefore, the participants in this activity were fewer than in Part 1. 15 students took part voluntarily from both groups, with a heterogeneous profile in terms of lecture attendance and academic performance. Not everybody understood the purpose of the assessment task, mainly because in the Physics Degree this is not a usual activity, and in one of the cases the student carried out the development of a full notebook instead of assessing the one provided. Finally he did the assessment as requested. Furthermore, two students did not understand the importance of giving a different mark for each item, and they gave a single mark for the whole notebook.

General instructions

As with the questionnaire in Part 1, both an English and a Spanish version of the instructions were produced. The following was provided to the students. "The work to be done consists of a report on the calculations with comments on the values obtained. Please reply explicitly to the questions listed in the questionnaire and other comments (comparison with other results, assessments of the calculations, etc.). All critical comments are valued. Also the student's ability to evaluate the usefulness of this material of their learning and their ability to objectively evaluate other students' work will be assessed in this activity".

Input numbers

Input example given to particular students in this activity. Three input parameters: semiconductor (Silicon or Germanium), impurity concentration in the P region, impurity concentration in the N region.

(English version) Student 1. Example.

Pn junction data.

Semiconductor: Silicon.

Impurity concentrations in the P region: $N_A = 10^{16} \text{ cm}^{-3}$.

Impurity concentrations in the N region: $N_D = 10^{17} \text{ cm}^{-3}$.

Tasks

(English version)

1-a) Calculate the potential barrier using the notebook.

1-b) Did this calculation help you to understand the concept of "potential barrier" in a pn junction? How?

2-a) Calculate the depletion region width.

2-b) Did this calculation help you to understand the concept of "depletion region" in a pn junction? How?

3-a) Maximum electrical field in the structure.

3-b) Did this calculation help you to understand the concept of "electric field" in a pn junction? How?

4-a) Perform the current versus voltage graphical representation.

4-b) Did this calculation help?

5-a) Calculate the capacitance for an applied voltage of 0.3V.

5-b) Did this calculation help you to understand the concept of "capacitance" in a pn junction? How?

Note for readers: the X-a questions deal with the physical quantities, while the X-b questions focused on the assessment of the students of several notebook's features regarding its learning usefulness on those particular physical concepts.

General assessment of the notebook

(English version)

Now that you have used the notebook, what do you think about the following issues?

Use a scale to assess them

- Design (1 - weak design; 10 - well designed). Explain why.
- Use (1- hard to use; 10 - easy to use). Explain why.

Out of a total of 10, grade the overall quality of the notebook and explain the reasons for grading it in that manner.

Results

As noted above, the tasks evaluate the process of using the notebook in addition to the reflection of the students as to why and what were useful about using the notebook. The questions mixed focus on physical quantities and assessment and learning while using the notebook.

Regarding the questions about physical quantities (questions X-a), all the students introduced the input numbers in the notebooks and they obtained the results in a straightforward manner. They included the output data provided by the notebook in their final reports, and they also modified the data several times to analyse their impact on the physical quantities. Nobody had problems using the notebook. Regarding the mark for this activity, the tutors focused on the scientific quality of the critical comments from each student about each particular output quantity.

Regarding the questions about assessment of the notebook as teaching material, the majority (14 out of 15) of the students believe that the notebook is useful to understand the role played by the input data introduced in each calculation as it is a pictorial representation of a calculation. Two out of 15 students clarified that although they could see the changes, that this did not help to understand the physical concepts because the theoretical framework and principles behind them were not explained in the notebook (although this was not the initial purpose of the notebooks and they had been informed to use it together with the explanations about the quantities in the lectures).

Therefore, students should have understood that the purpose of the notebook was not to become a self-explanatory teaching tool but a complementary tool.

For the sake of clarity it is worth mentioning that, in order to obtain physical quantities in the study of the pn junction, some approximations are widely used. The notebook does not need all these approximations since it can evaluate the expressions numerically, without any simplifications. In this regard, two students commented on the unclear relation between the notebook's calculations and the approximations used to obtain the algebraic formulae. They said that the explanation concerning the approximations employed to obtain some of the mathematical expressions in the notebook should have been given within the notebook, including the numerical comparison between the approximated and not approximated mathematical expressions, to help the evaluation of the accuracy of the approximations. In this manner, they would have been able to know in what cases the use of the approximations was appropriate. Even though their complaints were reasonable, the use of approximations in order to help electronics designers to make quick decisions is a tough issue to be explained in a Mathematica notebook.

The most positive items were the graphical representations. When the information is plotted visually ([Graph 8](#)), it is easier to understand. The electric field plots were also positively assessed as well as the current versus voltage plots of the pn junction.



Graph 8. Image from the notebook. The bars introduce the input values. Below is the electric field in germanium for those input parameters vs the position. $x = 0$ is the position of the junction, being the P region on the left and the N region on the right.

Student found the graphical plots very useful to understand the concepts, more useful than learning by just looking at numbers. The difficulties found in electronics are due to the multidimensionality of the equations which produces the dependence of a physical variable on many different parameters whose influence is difficult to isolate. The notebook facilitates this task, allowing students to “play” with the different data to see their influence on the physical qualities.

Assessment of the whole notebook by students

The following general questions were asked and the results are represented in Graph 9:

Now that you have used the notebook, what do you think about the following issues? Use a scale to assess them.

- Design (1 - weak design; 10 - good designed). Explain why.

- Use (1- hard to use; 10 - easy to use). Explain why.

Out of a total of 10, grade the overall quality of the notebook and explain the grade.

Results of Quantitative Analysis

1. Design of notebook (1 – Poor design; 10 – Excellent design).

Average and Standard deviation (7.9 ± 1.0)

2. Ease of use (1 - Difficult; 10 - Easy).

Average and Standard deviation (7.5 ± 1.3)

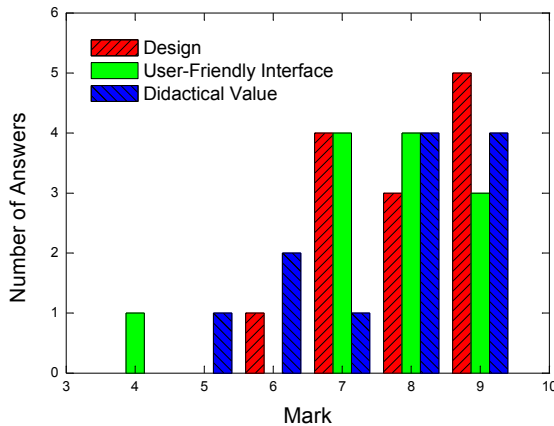
Two out of 14 students complained about the lack of information on how to use the notebook).

3. Didactical value of the notebook

Average and Standard deviation (7.8 ± 1.3)

Although only three students explicitly expressed the capacity to correct some errors that were found students were generally positive about the practice the notebook provided.

Most of the answers were within the interval from mean - standard deviation up to mean + standard deviation.



Graph 9: Assessment of the notebooks from the students. Each type of bar indicates a different concept (quality of design, user friendly interface, didactical value).

In Project Part 2, the students using the notebooks assessed it positively. After working individually on a particular PN junction they assessed the usefulness of the document. Most of the assessments were highly positive. They justified their assessment based on the usefulness of the teaching material to improve their understanding of the quantities considered within it, but also considering the effort by the student who developed it (Taras et al 2010). Students noted, “the capabilities of the notebook for dealing with the theory of the PN junction in a simple fashion is very useful, taking into consideration the complexity of the formulae that theory involves”. Also, “I did a general assessment of the software, always keeping in mind respect for the job carried out by other students [the developers], considering the effort they made to develop this software”.

The most critical students argued that they considered the notebook “as a working tool, but not as teaching material”. They find a lack of explanation of the theoretical basics on which the presented formulae rely. The mean and

standard deviation for the assessment was (7.79 ± 1.26) on a scale from 0 (lowest rate) to 10 (highest rate).

Discussion and Implications for future support of learning of the electronics course

Teaching of the subject in the following year did not change in terms of curriculum as a result of this research but it greatly influenced the way the students' motivation was worked on by the tutors. It also influenced the way the tutors presented their subject. Instead of trying to convince the students of the importance of electronics in the degree during the lectures, the motivation was worked on by showing them state-of-the-art electronic issues and highlighting the role of the electronic devices which are studied in the students' subject context.

The authors consider that facing students' and tutors' prejudices about the topics of a subject not only improves the quality of teaching, but also saves time wasted in trying to motivate the students from misconceived understandings which are wrong. What this work shows is that, in order to implement the teaching of a subject successfully, it is very positive to check the students' prejudices and opinions about the topics of a subject (and tutors' opinions of these) instead of taking them for granted. Just as importantly, it also served tutors in that it allowed them to examine and reflect on their own perceived beliefs about students' reactions to their subject. The more we talk with and question our students and ourselves, the better the likelihood of sharing understandings.

Conclusions

This cross-European research project into teaching and learning across subject area specialisms has been a very exciting process although difficult to manage because of the very different knowledge areas of the authors. This

research began slowly in November 2010 because of the need to share different contexts and perspectives. The process was also subject to gaps due to work pressures on both sides of the channel but we all feel that this enriched the final result with ideas from very different inspirations.

Sharing expertise and exchanging experiences in order to support our students' learning is an excellent means to reflect on our processes of learning and teaching. This has been a very fruitful collaboration which has contributed to understanding students following an electronics course within a physics degree. It has meant that subsequent to this, tutors could be more focused and efficient in helping their students for the future. Furthermore, it permitted students to develop and reflect on their own learning, and how their peer's work can contribute to it. Importantly, it required them to understand how, why and what aspects of this work was of value and support, thus developing their criticality and assessment skills.

The partnership highlighted tutors' concerns in learning, teaching and assessment which transcend contexts and countries, namely that we worry about how our students think and feel. Negotiating meaning and strategies for the classroom was beneficial in helping lecturers understand potential ambiguities and the problems that faced them and how they supported their students.

References

- Berry, R. & Adamson, B. (2011). (Eds.), *Assessment reform in education: policy and practice*. Dordrecht: Springer.
- Dysthe, O. (2008). The challenges of assessment in a new learning culture. In A. Havnes, & McDowell, L. (Eds.), *Balancing Dilemmas in Assessment and Learning in Contemporary Education* (pp. 213-224) New York/London: Routledge.
- Hager, P. & Hodkinson, P. (2009) Moving beyond the metaphor of transfer of learning, *British Educational Research Journal*, 35(4), 619-638.

DOI:10.1080/01411920802642371

- James, M. (2006). Assessment, Teaching and Theories of Learning. In J. Gardner (Ed.), *Assessment and learning* (pp. 47-60) London: Sage.
- Haggis, T. (2009): What have we been thinking of? A critical overview of 40 years of student learning research in higher education, *Studies in Higher Education*, 34(4), 377-390.

DOI: 10.1080/03075070902771903

- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81–112.

DOI: 10.3102/003465430298487

- Havnes, A. & McDowell, L. (Eds.), (2008) *Balancing Dilemmas in Assessment and Learning in Contemporary Education* New York/London: Routledge.
- McArthur, M. & Huxham, J. (2013). Feedback unbound: from master to usher. In S. Merry, Price, M., Carless, D., Taras, M. (Eds.), (2013). *Reconceptualising Feedback in Higher Education: Developing dialogue with students* (pp. 92-102). London and New York: Routledge.
- Nicol, D.J. and MacFarlane-Dick, D. (2005). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, 31(2), 199-218.
- DOI: 10.1080/03075070600572090
- Prosser, M. & Trigwell, K. (1999). *Understanding learning and teaching: the experience in higher education* Open University Press: Buckingham. Society for Research into Higher Education.
- Rust, C., O'Donovan, B. & Price, M. (2005) A social constructivist assessment process model: how the research literature shows us this could be best practice, *Assessment and Evaluation in Higher Education* 30(3), 231-240. DOI:10.1080/02602930500063819

- Tan, K. H. K. (2009). Meanings and practices of power in academics' conceptions of student self-assessment. *Teaching in Higher Education*, 14(4), 361-373. DOI:10.1080/13562510903050111
- Taras, M. (2013). Feedback on Feedback: uncrossing wires across sectors. In S. Merry, Price, M., Carless, D., Taras, M. (Eds.), *Reconceptualising Feedback in Higher Education: Developing dialogue with students* (pp. 30-40) London and New York: Routledge.
- Taras, M. (2010). Student Self-assessment: processes and consequences, *Teaching in Higher Education*, 15(2), 199-213. DOI:10.1080/13562511003620027
- Taylor, C. & Robinson, C. (2009). Student voice: theorising power and participation, *Pedagogy, Culture & Society*, 17(2), 161-175. DOI:10.1080/14681360902934392

Appendix 1

Questionnaire of students' opinion of the place of Electronics in the study of Physics

1. Have you ever followed a course in electronics before? YES NO
¿Has estudiado alguna asignatura de electrónica antes? (Si/No)
2. Explain what you think is the importance of electronics for society.
Explica brevemente qué piensas sobre la importancia de la electrónica para la sociedad.
3. Explain what you think is the importance of physics for society.
Explica brevemente qué piensas sobre la importancia de la física para la sociedad.
4. To what degree do you consider a physicist needs a background in electronics.
Explain this please.
¿En qué grado consideras que un físico necesita una base en electrónica? Argumenta brevemente tu respuesta, por favor.
5. To what degree do you consider electronics is a part of physics.

Explain this please.

¿En qué grado consideras que la electrónica es una parte de la física? Argumenta brevemente tu respuesta, por favor.

6. To what degree do you think that research on physics should be theoretical

Explain this please.

¿Qué importancia le concedes a la investigación puramente teórica en física? Argumenta brevemente tu respuesta, por favor.

7. Do you think that there is a balance between theory and practice in physics?

Explain this please.

¿Crees que hay un equilibrio entre la teoría y la práctica en los estudios de física? Argumenta brevemente tu respuesta, por favor.

8. When you chose to do a degree in physics did you know you would be studying electronics?

YES NO

Cuando elegiste hacer unos estudios en física, ¿sabías que cursarías una asignatura de electrónica? (Si/No)

9. What is your opinion of having an obligatory electronics component in your physics degree?

¿Cuál es tu opinión sobre tener obligatoriamente asignaturas de electrónica en tus estudios de física?

Maddalena Taras is Senior Lecturer at the Faculty of Education and Society, University of Sunderland, United Kingdom.

Francisco M. Gómez Campos is Associate Professor at the Departamento de Electrónica y Tecnología de los Computadores. Facultad de Ciencias. Universidad de Granada, Spain.

Juan B. Roldán is Associate Professor at the departamento Electrónica y Tecnología de los Computadores. Facultad de Ciencias. Universidad de Granada, Spain.

Contract Address: Direct correspondence to the author at the Faculty of Education and Society, Forster Building, Chester Road, University of Sunderland, Sunderland (United Kingdom). E-mail address: maddalena.taras@sunderland.ac.uk.

The Crisis of Disengagement: A discussion on motivation change and maintenance across the primary-secondary school transition

Cheng-Yu Hung
University of Cambridge

Abstract

The transition from primary to secondary education signals a process of developing and maturing physically and mentally, but this ‘rite of passage’ for some young adolescents is often associated with a drifting interest in school education. This phenomenon, caused by a decreased motivation for learning, has been observed by many relevant studies. This article adopts the psychological approach to study this long-lasting educational phenomenon while employing ‘intrinsic-extrinsic motivation theory’ and ‘goal theory’ to investigate the gap between primary and secondary schools as well as what possible pedagogies there are to maintain or stimulate the pupils’ motivation. An intrinsically motivated student acquires knowledge out of curiosity and interest, and they are willing to face the more difficult challenges that secondary education provides. As identified in the conclusion, the creation of a more integral educational system can alleviate the decrease in motivation while pupils undergo this period. A more amiable educational environment can be maintained that enhances the pupils’ self-concept, learning efficacy, and a sense of volition as well as self-determination to circumvent this transitional crisis.

Keywords: motivation, intrinsic-extrinsic motivation theory, goal theory, self-conception, self-efficacy



La Crisis de la Desconexión: Una Discusión sobre la Motivación en la Transición entre la Primaria y la Secundaria

Cheng-Yu Hung
University of Cambridge

Resumen

La transición de primaria a secundaria es un proceso de desarrollo y madurez física y mental que para algunos adolescentes se presenta como un “rito de paso” que se asocia a menudo con una pérdida de sentido en relación a la educación escolar. Este fenómeno, causado por la motivación decreciente para el aprendizaje, ha sido destacado en muchos estudios relevantes. Este artículo adopta la perspectiva psicológica sobre los fenómenos educativos de larga trayectoria empleando la “teoría de la motivación intrínseca-extrínseca” y la “teoría de la motivación” para investigar la brecha existente entre escuelas de primaria y de secundaria así como las posibles pedagogías útiles para mantener o estimular la motivación del alumnado. Un estudiante motivado intrínsecamente adquiere el conocimiento no por la curiosidad y el interés, y miran de afrontar los retos más difíciles que la educación secundaria les depara. Como se identifica en la conclusión, la creación de un sistema educativo más integral puede aliviar el decrecimiento de la motivación mientras los alumnos se encuentran en dicho periodo. Un ambiente educativo más afable puede mantener el auto-concepto de los estudiantes, la eficacia en el aprendizaje, y el sentido de voluntad así como la auto-determinación para evadir cualquier crisis en la transición.

Palabras clave: motivación, teoría de la motivación intrínseca-extrínseca, teoría de la motivación, auto-concepción, auto-eficacia

From childhood to adulthood, this transitional period is second only to the rate of growth occurring during infancy (Petersen & Taylor, 1980). Unlike infants, young adolescents undergo the dramatic change with a developed consciousness and thus, biological change and psychological conditions have a great influence on behaviour. The hormone system causes instability and this critical phase is characterised as a time of storm (Boxer, Tobin-Richars & Petersen, 1983). However, physical and psychological crises are not the only unstable factors which adolescents have to face. After proceeding to secondary school, a brand new school climate and peer culture is ahead of them. Simmons, Blyth, Van Cleave, and Bush (1979) pointed out that the transition to a new environment sometimes is more devastating for early adolescents when they are simultaneously under pubertal change. As is proven by some research (Anderman & Midgley, 1997; Doddington, Flutter & Rudduck, 1999; Harter, Whitesell & Kowalski, 1992; Warburton & Spray, 2008; Zanolini & Usai, 2002), a downturn in learning motivation and incremental disengagement from school are discernible during the transition from primary to secondary education.

To elaborate the fluctuation of motivation, Observational Research and Classroom Learning Evaluation (ORACLE) tested pupils' enjoyment, motivation and achievement across the transition, finding that motivation reaches its peak in the first term after transition but declined to a level lower than that prior to transfer in primary school (Delamont & Galton, 1986; Galton & Willcocks, 1983). In the same survey, this overall deteriorating phenomenon happened to 40% of pupils and was attributed to environment change and curriculum discontinuity (Galton, Morrison & Pell, 2000). The later related researches also identified an identical result (Rainer & Cropley, 2013). Importantly, a study conducted by Roderick (1992) connected the

relationship between lower motivation and learning outcome and concluded that those students whose grades declined the most after the transition were more likely to drop out of school later. According to the above existing research, most pupils encountered the transition between the ages of 11 and 13, depending on different educational systems across countries. Therefore, this article will focus on this age group that proceeds from primary/elementary education to the next stage of schooling, either secondary, junior high or middle school according to the term used in different settings. Having identified the gap between primary and secondary school, this article will employ the intrinsic-extrinsic motivation theory and goal theory to determine the possible pedagogies that can maintain or stimulate pupils' motivation and the learning strategies that have been respectively adopted by pupils with higher and lower motivation. Before that, this article will first explore the interplay between ability beliefs, self-concept, self-efficacy and motivation. This article will draw upon a large body of literature investigating the decrease of each across the transition as evidence of motivation decline and provide advice to the education authority, schools and teachers to craft a more promising environment for pupils to maintain or boost the engagement of learning. However, it is noted that the analysis of pupils' psychological change during the transition should not be regarded as being universal when it is applied to evaluate a specific region or country due to social, cultural and educational variations.

Is motivation deterioration a necessary 'rite of passage'?

Does the motivation decline occur just during the transition? Or is it a cumulative effect and shown more conspicuously across the primary-secondary transition? Nicholls and Miller (1984) found that 5- and 6-year olds regard effort and ability as positively related, but in contrast, many of

the 10- to 13-year olds viewed them as inversely related, which means that younger students were more likely to believe that ability is changed through efforts. Dweck and her colleagues (Dweck & Elliot, 1983; Dweck & Leggett, 1988) also conducted research on American elementary school students' beliefs about their intelligence and the result indicated that older children had stronger entity views than did younger ones. Those researchers used both questionnaires and interview methods to investigate elementary school students and found that pupils gradually come to believe that ability is less malleable and manageable with grades. In other words, after a series of failures, they start to convince themselves that the failure consists in the lack of ability and this recurrent thought undermines their motivation, which denotes the reciprocal relationship between ability beliefs and motivation. What is worse, when they go to secondary school, they find that the ability is stressed more than in primary school (Freedman-Doan, Wigfield, Eccles, Blumenfeld, Arbreto & Harold, 2000; Zanobini & Usai, 2002). In addition, a number of literature data (Harter, 1981a; Marsh, 1989; Wigfield *et al.*, 1997) has further identified that motivation, positive attitudes toward school and ability beliefs demonstrate a substantial decrease especially during primary-secondary transition. Therefore, it can be clarified that the decline of motivation occurs from the late primary stage but plummets across the transition.

Motivation and self-concept

To broaden the scope from ability beliefs to social cognitive theories, self-concept and self-efficacy are the two other indicators used to observe the motivation fluctuation during the transition. Some studies use the terms self-concept, self-esteem, self-efficacy interchangeably (Byrne, 1996). The general agreement is that self-concept is a multidimensional and multifaceted construct, including cognitive, affective, and behavioural

aspects. In other words, self-concept is a personal description and evaluation of the pupils' strengths and weaknesses (Harter, 1985). Different from self-concept, Bandura (1986, p.168) describes self-efficacy as '*capability to attain designated types of performances*' and this term is a context-specific assessment of competence concerning a specific task, which is the major distinction from self-concept's more global and less context-dependent traits (Pajares & Miller, 1994). A number of other studies identified consistently that pupils' self-concepts influence their achievement motivation because of their effect on their effort, persistence and anxiety (Nicholls, 1984; Covington & Omelich, 1981; Elliott & Dweck, 1988). A primary-secondary transitional study by Wigfield, Eccles, MacIver, Reuman, and Midgley (1991) investigated pupils' domain-specific self-concept change via interview. They found a substantial decrease after the transition in students' English self-concept, but merely a trend for maths self-concept. Besides, boys' and girls' self-concepts of ability changed across the subjects but the magnitude of the difference did not change after the transition. As traditional stereotype to gender differences, girls' mathematics self-concept becomes more negative and lower than boys' after transition. In contrast, girls' attitude toward English remains more positive than boys' before and after transition.

Motivation and self-efficacy

Self-efficacy bears on an individual's judgments of their capabilities to solve a specific problem or perform a task. It can be argued that self-efficacy and motivation have a strong correspondence, but the published literature about their relationship is few, limited and mixed (Anderman & Maehr, 1994). Midgley, Anderman and Hicks (1995) administered a questionnaire-based and non-subject-specific survey to investigate how self-efficacy changes during the transition. The student sample consisted of 291 elementary and

678 middle school students and male and female students were equally represented. The researchers hypothesised that students' self-efficacy would decrease, but surprisingly the increased self-efficacy was shown in the result. The researchers inferred that this is because the academic work in middle schools requires higher thinking, more learning strategies and yet less effort, compared to that in elementary school, so the lighter workload makes them feel more capable of handling the school work. In addition, a study by Gorwood (1994) indicated that some pupils regarded the contents of mathematics easier than before because they had reached national curriculum level 5 in primary schools but the secondary school started from level 3 in the UK. Therefore, the research unveils some problematic discontinuities underlying the English national curriculum and highlights that the liaison between primary and secondary schools was weak even after the implementation of the national curriculum.

Back to the reasons why there was no substantial drop in self-efficacy, Doddington, Flutter and Rudduck (1999) moving up to secondary level denotes that they are on the way to adulthood and the expectation of autonomy and self-determination toward secondary schools implies that they are more capable in many aspects, contributing to over-confidence. Specifically, in terms of research methods, Bandura (1986, p. 170) cautioned that *'self-efficacy must be specifically rather than globally assessed'*. Therefore, there could be a different result if it was conducted in terms of subject matter domains like English and mathematics.

Although the pattern of declines in self-efficacy is not always found along with a deterioration in motivation (Harter, 1982), self-efficacy, self-concept and motivation are indeed interconnected as can be seen when referring to other relative self-efficacy studies (Pajares, 2002; Pajares & Miller, 1994; Wigfield, Eccles, MacIver, Reuman & Midgley, 1991; Wigfield, Eccles, & Pintrich, 1996). For example, in research by Wigfield, Eccles, and Pintrich (1996), it was reported that boys and girls demonstrate

equal confidence in mathematic ability during the elementary years, but by middle school, boys showed higher self-efficacy than do girls in mathematics, which corresponds to the same result from the self-concept survey (Wigfield *et al.*, 1991). After discussing how ability beliefs, self-concept, self-efficacy and motivation affect each other and also decrease during the transition, the next section will take social-contextual factors into consideration and elaborate the interaction and causality between class/school culture and personal motivation shift.

What are the differences of contextual factors between primary and secondary school?

Primary and secondary school environments differ in structure. In contrast with primary school, in secondary schools, subject-specific teachers offer pupils the opportunity to learn to negotiate, communicate and adjust to different kinds of teachers. Besides, with more experience of moving from one classroom to another for different subjects and encountering more teachers and senior and junior peers, they are more affected by the whole school culture and climate than they were in primary school (Harter, Whitesell & Kowalski, 1992). According to a survey conducted in Dundee by Zeedyk, Gallacher, Henderson, Hope, Husband and Lindsay (2003), the interviewed respondents, including pupils, parents and teachers, thought that secondary schools have a heavier academic workload and place more stress on peer relationships. When primary pupils were asked about their expectations from secondary level, the greater value of academic skills and self-empowerment are the major two elements they anticipated.

Obviously, the transition process has drawn the attention of primary school pupils, parents, teachers and educational authorities. Some 'transition support programmes' have been launched. Future secondary school pupils

have the chance to visit the secondary school they will be attending, meet new teachers, and know the new campus, which tends to help pupils adapt to the new place in advance and modify their anticipation for better adjustment. However, a series of studies indicated that students' motivation markedly declines after transition (Anderman & Midgley, 1997; Doddington, Flutter & Rudduck, 1999; Harter, Whitesell & Kowalski, 1992; Warburton & Spray, 2008; Zanobini & Usai, 2002). The central and most important task for the transition support project should not be to try to fit primary pupils into this environment which is known to threaten their motivation, but instead, should be to re-investigate how secondary schools should change in order to maintain pupils' motivation for future study. The following section will display the difference between primary and secondary schools and provide advice for motivation maintenance.

Intrinsic and extrinsic motivation shift during the transition

The decline in motivation implies the attenuation of intrinsic motivation. The social context can create either an intrinsic or extrinsic motivationally oriented environment and the constructed atmosphere has a great influence on the learners. An intrinsically motivated person has a full sense of volition and acquires knowledge for its own sake, which characterises a high-quality learner with higher self-efficacy, conceptual understanding ability and proactive pursuit of personal growth (Deci, Vallerand, Pelletier & Ryan, 1991). The environment gives them 'choices' instead of regulations and controls. In contrast, extrinsically motivated people link learning to the pursuit of prizes and praise or the avoidance of penalty and embarrassment; thus, they pay more attention to the consequences than the essence of the study. The extrinsic motivational context seeks to use external rewards or punishments to maintain learners' motivation but its nature of more control and less autonomy diminishes learners' self-worth and interests.

Harter (1981b) utilised a self-report scale to observe 3000 pupils ranging from 3rd grade to 9th grade to test their intrinsic motivation shift. A general decline was indicated in the result, changing from a predominantly intrinsic to a more extrinsic motivational orientation. Particularly, a substantial shift was found between 6th grade and 7th grade. To explain further this trend, the context of primary and secondary schools should be juxtaposed.

After entering secondary level, pupils desire more opportunities and empowerment from school for self-determination because they perceive themselves in a new stage heading for adulthood. However, a mismatch exists between the given environment and pupils' expectation (Eccles, Wigfield, Midgley, Reuman, Iver & Feldlaufer, 1993). The secondary school ethos does not correspond to the incremental sense of autonomy. Because of stricter school regulations, a more rigid national curriculum and more distant teacher-student relationship in contrast to primary school system, students have, on the contrary, fewer chances to make their own decisions and express their self-determination, which suppresses their school engagement and lessens the positive attitude toward school (Anderman & Maehr, 1994). Deci *et al.* (1991) also indicated that 'external regulations', including the offer of a reward and the threat of a punishment are detrimental to intrinsic motivation since material rewards and constraints present the least self-determined form of extrinsic motivation.

Meanwhile, students perceive teachers as more controlling after transition (Harter, Whitesell, & Kowalski, 1992). Increasing control not only deprives pupils of possible choices, but also distances the relationship between teachers and students, which implies another cause of motivation decline. Midgley, Feldlaufer and Eccles (1989) conducted a study on students' perceptions of the supportiveness of their teachers before and after the transition to junior high school. This two year longitudinal research of 1301 pupils demonstrated that primary school teachers paid more attention to each student which was beneficial to closer teacher-student relationships and

engendered a supportive environment but after transition, mathematics teachers were less supportive to their learning. The result of the Teacher Support scale concluded that the quality of relationship has a positive correlation with motivation and the value which pupils place on maths, especially in the case of lower achieving students. In other words, the distant relationship in junior high school reduces pupils' motivation and the value of mathematics to them decreases accordingly.

However, subsequent to this study, pupils' statement about 'the less supportiveness of secondary school teachers' needs to be examined more closely. This thought among pupils implies that sufficient attention and support from teachers are what early adolescents need, and therefore, the present secondary school pastoral system or the role of form teacher should be re-evaluated given that better teacher-student relationship can improve motivation. It is understandable that pupils perceive secondary teachers to be less supportive because the specific-subject teaching routine reduces the average time allotment and attention pupils receive from each teacher. This study poses a question: is the size of a class or a school another crucial reason for motivation deterioration at secondary education level? The construction and maintenance of a warm, friendly, supportive environment is what educational practitioners are supposed to pursue.

It is also important to point out the relationship between intrinsic and extrinsic motivation. In early research, both motivations seem to be antithetical and antagonistic. However, another study (Ryan & Connell, 1989) suggests that the different types of extrinsic motivation can be integrated into intrinsic motivation, a process which is called 'internalisation' and this process can bridge the gap between the intrinsic and extrinsic dichotomy. On the assumption that everyone may become inherently motivated to absorb new information or engage in previously uninteresting activities, 'internalisation' is a motivated process through which learners transfer regulation by external contingencies into regulation

by internal processes (Schafer, 1968). For example, a student who is not interested in the British political regime finds it hard to learn about it intrinsically. If some extrinsic contingencies intervene such as peers' positive feedback or praise from teachers, 'internalisation' will start to transform the contingency into an intrinsic motivational process. With the incremental self-worth constructed from feedback and compliments, pupils discover the enjoyment of learning about the political regime and link their positive attitude with it. Afterwards, the motivation of the student's study of political regime becomes internal and external contingencies are no longer necessary (Ryan & Connell, 1989).

Concerning the application of intrinsic motivation to practical teaching, positive feedback is found beneficial but this happens only when the feedback is accompanied by support for autonomy, which can fuel pupils' perceived competence. In contrast, feedback with negative remarks makes pupils feel controlled and lowers their self-perception and efficacy. As for the other two 'external events' prevailingly adopted by secondary school teachers – rewards (money, cards) and personal/group competition, rewards are likely to stimulate temporarily pupils' interest and grab their concentration in a short time, but when the 'reinforcement' terminates, they tend to lose attention and engagement (Deci *et al.*, 1991). That is to say that their external motivation fails to be internalised or integrated into intrinsic motivation. The second of the 'external events' applauds competition and comparison, which forces pupils to act, think, and behave in a certain way to win. In other words, the pupils are under pressure and feel controlled and the lack of self-determination diminishes the individual's sense of autonomy and intrinsic motivation.

Mastery and performance orientation shift during the transition

In line with the aforementioned evidence and reasoning, extrinsic motivational orientation undermines pupils' motivation and positive attitude toward class and school. Apart from distinct environmental factors between primary and secondary schools, the grading practice is another extrinsic incentive which is specially stressed. As Eccles, Midgley and Adler (1984) pointed out the junior high school, in comparison to the elementary school, is more impersonal, more formal, more evaluative, and more competitive. Secondary schools are characterised by higher requirements of academic performance and standardised examinations for evaluation. The impersonal evaluation provides pupils with an objective judgment of their performance and reminds them to locate their ranking in the class or school, which contributes to a form of social comparison.

Turning to goal theory evaluation, a different perspective can explain the decreased motivation after transition. Goal theory is concerned with how people think about themselves, their tasks and their performance. Nicholls (1984) states that people have different reasons for learning, either because they want to strengthen their competence, or because they want to display their ability and surpass others. Referred to by various names, the former type of learning is entitled 'task involvement / task orientation / mastery goal'. People who are mastery-oriented tend to study out of their intrinsic motivation to make progress in their ability without regard to the performance of others. In other words, the comparison between themselves and peers is not important to them and mastery-oriented learners are more likely to persist in goal attainment in the face of difficult tasks (Leo, & Galloway, 1996).

As for the latter type of motivational process, it is called 'ego involvement / performance orientation / performance goal'. When learners are oriented to performance goals, they engage in the tasks because they

want to outperform the peers and demonstrate their ability (performance-approach). In contrast, they might also choose to disengage in the tasks to maintain the positive viewpoints about their ability and avoid the appearance of incompetence (performance avoidance). Nicholls (1984) describes that individuals classified as performance avoiders usually have high ego involvement and low perceived competence, and they seek to avoid low normative judgments.

Some literature has explicated that early adolescents experience the school environment as transforming from more mastery orientation to more performance orientation (Anderman & Midgley, 1997; Midgley, Anderman & Hicks, 1995; Warburton & Spray, 2008). In Anderman and Midgley's (1997) longitudinal research, 341 students were surveyed in the last year of elementary school and again in the following year when they were in the first year in middle school. Personal task and performance goal orientation, perceptions of the task and performance goal structure in the classroom, and perceived academic competence were the five constructs to be assessed. A 5-point Likert-type scale was adopted and the questionnaire focused on English and mathematics. Unsurprisingly, students espoused performance goals and their classrooms became more performance-oriented after the transition than before. The result was found that the transition did not affect all of those students but greatly impacted on lower ability females. The issues of appearance image, interpersonal relationship and relationship with adults were the possible factors to cause grades to decrease from the researchers' inference. In contrast, higher achieving females did not experience negative change from transition and they were perceived as more capable of coping with pubertal and academic changes.

With the previously mentioned ability beliefs shift, early adolescents at this stage start to regard ability as being less modifiable and begin to realise that more effort does not necessarily improve inherent intellect. Combining those psychological factors, in the more competitive secondary school

environment, those high achieving females compare their performance with that of their classmates and feel superior in academic ability, and this is associated with attributions of success to higher ability from students' perspective (Nicholls, 1979). In other words, for some students, their self-efficacy and self-perception are increased at the expense of others' failure. On the contrary, the lower achievers attribute their poor performance to deficiency in ability and in order to protect their self-worth, they avoid competition or stop trying to deflect the inference of incompetence because a combination of diligence and failure is compelling evidence of low ability (Johnson, 1994; Kun & Weiner, 1973). As Nicholls (1979, p.45) said, *'fairness of exams has been simulated well enough to make failure more personal and painful. A genuine or fair competition produces the clearest possible information for ability attributions, and therefore causes a strong connection between motivation and performance'*. The above analysis seems cruel but reflects the reality of life in classrooms.

A student with mastery orientation or performance orientation demonstrates entirely different attitudes to learning and study strategies. With the belief that success depends on hard work, interest, and understanding instead of rote memorisation, the mastery-oriented students enjoy coping with difficult questions and pay persistent attention to learn out of intrinsic interest. This attitude contributes to 'deep-processing' strategies and they link new knowledge with prior experience to seek full comprehension (Nolen, 1988; Murdock, Hale and Weber, 2001). In contrast, performance-oriented pupils are affected by heightened competition and comparison, and extrinsic rewards are what they pursue, such as getting good marks, impressing teachers and gaining the peers' respect. However, the less intrinsic motivation leads to 'surface-level' strategies'. They tend to memorise the factual knowledge in a short time to pass school tests, but difficulty and frustration can easily hinder their persistence in learning (Murdock *et al.*, 2001). Therefore, the motivation orientation affects pupils'

learning strategy use either in an adaptive or maladaptive direction (Nolen, 1988).

Lam, Yim, Law and Cheung (2004) conducted research in two secondary schools to investigate the outcome of two different types of learning strategies. Fifty-two seventh-grade pupils were separated into two classrooms and one of the classrooms was mastery-oriented, stressing the enjoyment of learning a typewriting course and the other was performance-oriented, accentuating grades and class comparison. After a taught session, two tasks were assigned to every pupil (one easy task and one difficult task). The students in the competitive condition outperformed the non-competitive group in the easy task. But the opposite result was shown in the difficult task. The result reflected that performance-oriented learning strategy (or surface-level learning) was beneficial to an easier task/exam, but could not ensure the same outcome in a more difficult one.

Similar conclusions are also explicated in Grolnick and Ryan's study (1987) comparing two groups of learners' motivation and learning outcome. They found that pupils showed more anxiety and less interest in a reading task when they were told that they would be given a test another day. In contrast, without exam pressure, the other group of pupils was more interested in reading the text. After testing their comprehension of the task, the first group recalled more rote materials but the second group had a stronger conceptual understanding of the task. More interestingly, after eight days, in the re-test, the first group members' understanding dropped substantially but the second group maintained their understanding of the material, which indicated that a task-oriented adaptive strategy did improve the retention of understanding.

As a result, it is argued that competition does not facilitate deeper learning and the performance-oriented school structure is hazardous to some pupils' perceived competence. Pupils avoid challenge because they are not sure of winning and therefore they lack a sense of adventure in learning and

always seek quick solutions (Kaplan & Maehr, 1999). From personal experience, teachers tend to employ tests as a means to require pupils to learn but this extrinsic incentive possibly not only decreases their motivation but also creates a ‘winner or loser’ environment if the examination is only used to test superficial understanding and compare students’ competence. When applying goal theory to practical teaching, it can be clarified that the mastery goal is constructed by encouraging students to understand the contents, regard failure as a process, and value persistent trials and errors (Urdu & Turner, 2005). Meanwhile, the abovementioned two pieces of research may remind us to re-consider school examinations. The underlying meaning behind those evaluations should be explored. Do the examinations merely test students’ factual knowledge and in turn reinforce the message that performance-oriented strategy use is enough for passing the tests? Diseth and Martinsen (2003) claimed that the nature of examinations, from their perspective, leads students to utilise short-term learning strategies. Scouller (1996, 1998) also found that the multiple-choice format tends to elicit memorisation-related activities and is better replaced by assignments for deeper learning.

However, adaptive or maladaptive learning strategies affect not only academic achievement but also well-being (Covington, 1992). In primary school, the more mastery-oriented structure stresses efforts, small group tasks, collaborative learning. In contrast, the competitiveness in secondary school has a great impact on lower achieving students’ psychological well-being (Kaplan & Maehr, 1999). The constant failure, humiliation and ‘loser’ labelling generated from comparison undermines personal self-esteem, and in the long run, those pupils manifest a ‘helpless’ pattern alongside negative emotion, disengagement and anti-social behaviour (Dweck & Leggett, 1988). Suicidal thoughts and cheating are two direct negative effects of performance-oriented structure. Asian education systems in comparison to western systems, is characterised by higher competition and by being exam-

driven. *Time*, for example (Bennett, Horn, Huang, Ko, Macintyre, & Wong, 2002) covered a 7-year-old student who committed suicide after failing a test in Chinese dictation and mentioned that one in three teenagers in Hong Kong have had suicidal feelings. In terms of cheating, lower academic self-efficacy is assumed to raise the possibility that pupils would cheat (Murdock *et al.*, 2001). Anderman and Westerfield (1998) found a direct support for a relationship between orientation structure in the classroom and cheating, indicating that cheating was inversely related to task goals and positively related to extrinsic motivation. When asked why they cheated in the exams, according to Michaels and Miethe's (1989) study, pupils replied 'fear of failure' most. In terms of a pedagogical strategy to maintain pupils' motivation, an inevitable element is the cultivation of a positive peer culture in secondary schools. Teachers play a salient 'interventionist' role to provide instructional assistance and create an amicable environment and cooperative atmosphere in the classroom to support the struggling students (Hamm, Farmer, Lambert & Gravelle, 2013). It is clear that various facets of the school environment have a strong effect on pupils' motivation shift and subsequent social behaviour. For example, schools on the one hand espouse personal progress and versatile development, but on the other hand, stress standardised examination pass rates and grade performance. An overly comparison-centred secondary school culture might cause more psychological and behavioural problems and cumulative pressure undermines pupils' motivation.

From the literature mentioned above, it is clear that mastery-orientation contributes to deeper study but performance-orientation only retains personal ability at the surface level and causes a hiatus in progress (Meece, Blumenfeld, & Holye, 1988; Nolen, 1988; Nolen & Haladyna, 1990; Pintrich & De Groot, 1990; Pajares & Miller, 1994). However, some research is beginning to explicate that these goals are not opposite ends of a continuum but 'a right angle' in nature and a learner could use both of them

depending on the difficulty of the learning scenario he/she is faced with (Ainley, 1993; Harackiewicz, Barron, Pintrich, Elliot & Thrash, 2002; Maehr & Pintrich, 1991). In Elliot and McGregor's research (1999), they found that a performance-approach is positively related to exam performance, and mastery goals facilitate learners' retention of exam-relevant materials. The same conclusion is shown in Harackiewicz, Barron, Pintrich, Elliot and Thrash's research (2002), which links performance-approach goals with some adaptive outcomes. Harackiewicz *et al.* (2002) brought forth an 'interactive goal pattern', stating that the optimum learning strategy is the simultaneous adoption of a performance-approach goal and mastery goal. The Mastery \times Performance-Approach Goal interaction ensures that the immense inner motivation can meanwhile be demonstrated by the external high grades, resulting in the highest overall level of performance (Elliot & McGregor, 1999; Harackiewicz *et al.*, 2002). For example, students may choose mastery goal when they study the contents of subjects, and use performance-approach goal to prepare for exams. The multiple goal perspective suggests that the combination of these two seemingly antagonistic goals (Mastery and Performance goals) provide the different types of students with a selective goal pattern to employ. In this way, the compatible form of approach can function effectively.

Conclusions

This article has unveiled the contextual transition between primary and secondary education in order to investigate the causes of the decline in motivation shown in various related studies. Firstly, the mismatch between expectations and reality deters pupils from further engagement in secondary school. The secondary school ethos does not correspond to the incremental sense of autonomy. Because of stricter school regulations, a more rigid national curriculum and more distant teacher-student relationship in contrast

to primary school system, students have fewer chances to make their own decisions and express their self-determination. The decreased autonomy and impersonalised student-teacher relationship makes the pupils feel controlled; this is associated with deterioration in motivation. Secondly, the continuity of the national curriculum and the 'transition support programme' should be carefully re-examined. Although the implementation of national curriculum tends to construct consistent and continuous subject plans to link primary and secondary curricula, Gorwood (1994) countered this positive statement, arguing that the national curriculum not only is questioned regarding the ability to bridge the gap between primary and secondary schools by educators and parents, but also may undermine the original motivation-oriented primary education. For example, primary school teachers used to encourage pupils to talk about their interests and write down personal goals and resolutions in classroom. However, with the advent of the national curriculum, primary school teachers are scheduled by a fixed timetable and are aware that time is not always available for pursuing interest maintenance.

Thirdly, the competitive environment in secondary schools fails to maintain this high level of motivation which exists in primary schools. Constant comparison damages lower achieving learners' self-perception and self-efficacy, leading to maladaptive strategy selection to avoid challenge and prevent the implication of incompetence. For other students, they either perceive academic- and grades-centered secondary education as a 'winner takes all' arena or else they adopt a surface-level learning strategy to get the extrinsic rewards as soon as possible. However, even though a number of studies have articulated the optimum learning scenario for students, contaminating factors such as unconscious comparison, self-assessment by grades, and exam pass rates unintentionally have a deleterious effect on the learning environment and this is deemed to be the hardest obstacle to overcome when education practitioners attempt to apply theories to practice. Thus, it can be summarised that these three factors undermine the learning

environment of secondary education and are accountable for pupils' gradual loss of engagement at school.

Motivation is always one of the most important determinants of successful schooling. Several papers have indicated that belief in ability, self-perception and self-efficacy decrease after the transition to secondary school (Covington & Omelich, 1981; Dweck & Elliot, 1983; Dweck & Leggett, 1988; Elliott & Dweck, 1988; Nicholls, 1984). However, one point that should be noted is that the deterioration may not be uniform across all subjects; indeed, a student may actually become more motivated in non-academic subjects, such as sports and music despite a drop in the overall level of motivation and this shows that care should be taken before making generalisations. Likewise, this phenomenon of a decrease in motivation should not be regarded as being universal, given that the social, cultural and educational factors vary across countries.

In terms of the pedagogical strategies conducive to maintaining and boosting pupils' motivation, the techniques that enhance learners' intrinsic motivation and mastery goal should be incorporated in teaching and classroom management. Besides, incremental empowerment, a supportive peer culture and a closer teacher-student relationship can not only engage pupils in academic study, but also in school activities (Eccles *et al.*, 1993; Hamm *et al.*, 2013; Midgley *et al.*, 1989). Liaison between primary and secondary schools, including communication between primary and secondary school teachers, the supply of students' background and performance information, and the exchange of teaching methods and understanding of the continuity of the curriculum can all help to achieve an ideal 'seamless' transition (Rainer & Cropley, 2013, p.8).

In addition, it should be also stressed that extrinsic motivation / performance goal and intrinsic motivation / mastery goal are not the opposite ends of a continuum and the traditional framework therefore is under reconsideration (Ainley, 1993; Harackiewicz *et al.*, 2002; Maehr & Pintrich,

1991). By breaking the dichotomous approaches, the theories of 'internalisation' and 'the Mastery \times Performance-Approach' have received more attention recently and these multiple pathways provide yet a third way to maintain and enhance pupils' motivation. The task of transforming extrinsic motivation and performance goal into an adaptive learning strategy is now underway. Further study can seek the combination of the intrinsic-extrinsic motivation and goal theory to cultivate pupils' adaptive learning strategies and establish more effective and efficient teaching methods to produce a higher quality of schooling.

References

- Ainley, M.D. (1993). Styles of engagement with learning: multidimensional assessment of their relationship with strategy use and school achievement. In Dowson, M. & McInerney, D.M. (2003). What do students say about their motivational goals? Towards a more complex and dynamic perspective on student motivation. *Contemporary Educational Psychology*, Vol. 28, pp. 91-113. DOI:10.1037/0022-0663.85.3.395
- Anderman, E.M. & Maehr, M.L. (1994). Motivation and schooling in the middle grades. *Review of Educational Research*, Vol. 64, 2, pp. 287-309. DOI: 10.3102/00346543064002287
- Anderman, E.M. & Midgley, C. (1997). Changes in achievement goal orientations, perceived academic competence, and grades across the transition to middle-level schools. *Contemporary Educational Psychology*, Vol.22, pp. 269-298. DOI: 10.1006/ceps.1996.0926
- Anderman, E.M. & Westerfield, G. (1998). Motivation and cheating during early adolescence. *Journal of Educational Psychology*, Vol. 60, pp. 84-93. DOI: 10.1037//0022-0663.90.1.84

- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bennett, B., Horn, R., Huang, J., Ko, C., Macintyre, D., & Wong, D. (2002). School daze. *Time*, pp. 44-51.
- Boxer, A.M., Tobin-Richars, M. & Petersen, A.C. (1983). Puberty: physical change and its significance in early adolescence. *Theory into practice*, Vol. 22, 2, pp. 85-90. DOI: [10.1080/00405848309543044](https://doi.org/10.1080/00405848309543044)
- Byrne, B.M. (1996). *Measuring self-concept across the life-span*. Washington DC: American Psychology Association.
- Covington, M.V. (1992). *Making the grade: A self-worth perspective on motivation and school reform*. New York: Cambridge University Press.
- Covington, M.V. & Omelich, C.L. (1981). As failures mount: affective and cognitive consequences of ability demotion in the classroom. *Journal of Educational Psychology*, Vol.73, 6, pp. 796-808. DOI: [10.1037//0022-0663.73.6.796](https://doi.org/10.1037//0022-0663.73.6.796)
- Deci, E.L. Vallerand, R.J., Pelletier, L.G. & Ryan, R.M. (1991). Motivation and Education: the self-determination perspective. *Educational Psychologist*, Vol. 26, 3&4, pp. 325-346. DOI: [10.1080/00461520.1991.9653137](https://doi.org/10.1080/00461520.1991.9653137)
- Delamont, S. & Galton, M. (1986). *Inside the secondary classroom*. London: Routledge & Kegan Paul.
- Diseth, A. & Martinsen, O. (2003). Approaches to learning, cognitive style, and motives as predictors of academic achievement. *Educational Psychology*, Vol. 23, pp. 195-207. DOI: [10.1080/01443410303225](https://doi.org/10.1080/01443410303225)
- Dweck, C.S. & Elliott, E.S. (1983). Achievement motivation. In Mussen, P.H. (Ed.) *Hand book of child psychology*. Vol.4, pp. 643-691. New York: Wiley.
- Dweck, C.S. & Leggett, E. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, Vol. 95, pp. 256-273. DOI: [10.1037//0033-295X.95.2.256](https://doi.org/10.1037//0033-295X.95.2.256)

- Doddington, C., Flutter, J. & Rudduck, J. (1999). Exploring and explaining 'dips' in motivation and performance in primary and secondary schooling. *Research in Education*, Vol. 61, May, pp. 29-38. DOI: [10.7227/RIE.61.4](https://doi.org/10.7227/RIE.61.4)
- Eccles, J.S., Midgley, C. & Adler, T.F. (1984). Grade-related changes in the school environment: effects on achievement motivation. In Nicholls, J.G. (Eds). *Advances in adolescent development: from childhood to adolescence*, Vol.2 (pp. 134-155). Newbury Park, CA: Sage.
- Eccles, J.S., Wigfield, A., Midgley, C., Reuman, D.A., Iver, M.D. & Feldlaufer, H. (1993). Negative of traditional middle schools on students' motivation. *The Elementary School Journal*, Vol. 93, 5, pp. 553-574. DOI: [10.1086/461740](https://doi.org/10.1086/461740)
- Elliot, A.J. & McGregor, H.A. (1999). Test anxiety and the hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*. Vol. 76, 4, 628-644. DOI: [10.1037//0022-3514.76.4.628](https://doi.org/10.1037//0022-3514.76.4.628)
- Elliott, E.S. & Dweck, C.S. (1988). Goals: an approach to motivation and achievement, *Journal of Personality and Social Psychology*, Vol.54, pp. 5-12. DOI: [10.1037//0022-3514.54.1.5](https://doi.org/10.1037//0022-3514.54.1.5)
- Freedman-Doan, C., Wigfield, A., Eccles, J.S., Blumenfeld, P., Arbreto, A. & Harold, R.D. (2000). What am I best at? Grade and gender differences in children's beliefs about ability improvement. *Journal of Applied Developmental Psychology*, Vol.21, 4, pp. 379-402. DOI:[10.1016/S0193-3973\(00\)00046-0](https://doi.org/10.1016/S0193-3973(00)00046-0)
- Galton, M., Morrison, I. & Pell, T. (2000), Transfer and transition in English schools: reviewing the evidence. *International Journal of Educational Research*. Vol. 33, 4, pp. 341-363.
- Galton, M. & Willcocks, J. (1983). *Moving from the primary classroom*. London: Routledge & Kegan Paul. DOI: [10.1016/S0883-0355\(00\)00021-5](https://doi.org/10.1016/S0883-0355(00)00021-5)

- Gorwood, B. (1994). Primary-secondary transfer after the national curriculum. In Moon, B. & Mayes, A.S. (Eds). *Teaching and learning in the secondary school*. (Chapter 42, pp. 357-361). London: Routledge.
- Grolnick, W. & Ryan, R. (1987). Autonomy in children's learning: an experimental and individual differences investigation. *Journal of Personality and Social Psychology*, Vol. 52, pp. 890-898. DOI: [10.1037//0022-3514.52.5.890](https://doi.org/10.1037//0022-3514.52.5.890)
- Hamm, J.V., Farmer, T.W., Lambert, K., & Gravelle, M. (2013, May 6). Enhancing peer cultures of academic effort and achievement in early adolescence: Promotive effects of the SEALS intervention. *Developmental Psychology*. Retrieved from DOI: [10.1037/a0032979](https://doi.org/10.1037/a0032979), accessed 14 November 2013.
- Harackiewicz, J.M., Barron, K.E., Pintrich, P.R., Elliot, A.J. & Thrash, T.M. (2002). Revision of achievement goal theory: necessary and illuminating. *Journal of Educational Psychology*, Vol. 94, 3, pp. 638-645. DOI: [10.1037//0022-0663.94.3.638](https://doi.org/10.1037//0022-0663.94.3.638)
- Harter, S. (1981a). The new self-report scale of intrinsic versus extrinsic orientation in the classroom: motivational and informational components. *Developmental Psychology*, Vol. 17, pp. 300-312. DOI: [10.1037//0012-1649.17.3.300](https://doi.org/10.1037//0012-1649.17.3.300)
- Harter, S. (1981b). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: motivational and informational components. *Developmental Psychology*, Vol.17, pp. 300-312. DOI: [10.1037//0012-1649.17.3.300](https://doi.org/10.1037//0012-1649.17.3.300)
- Harter, S. (1982). The perceived competence scale for children. *Child Development*, Vol.53, pp. 87-97. DOI: [10.2307/1129640](https://doi.org/10.2307/1129640)
- Harter, S. (1985). *Manual for the self-concept profile for children*, Denver, CO: University of Denver.
- Harter, S., Whitesell, N.R. & Kowalski, P. (1992). Individual differences in the effects of educational transitions on young adolescents' perception

- of competence and motivational orientation. *American Educational Research Journal*, Vol. 29, 4, pp. 777-807. DOI: [10.3102/00028312029004777](https://doi.org/10.3102/00028312029004777)
- Johnson, S. (1994) Self-worth and the fear of failure. In Covington, M.V. (Ed). *The will to learn: A guide for motivating young people* (chapter 4, pp.-103). Cambridge: Cambridge University Press.
- Kaplan, A. & Maehr, M.L. (1999). Achievement goals and student well-being. *Contemporary Education Psychology*, Vol. 24, pp. 330-358. DOI: [10.1006/ceps.1999.0993](https://doi.org/10.1006/ceps.1999.0993)
- Kun, A. & Weiner, B. (1973). Necessary versus Sufficient Causal Schemata for Success and Failure. *Journal of Research in Personality*, Vol. 7, 3, pp. 197-207. DOI: [10.1016/0092-6566\(73\)90036-6](https://doi.org/10.1016/0092-6566(73)90036-6)
- Lam, S.F, Yim, P.S., Law, J.S.F & Cheung, R.W.Y. (2004). The effects of competition on achievement motivation in Chinese classrooms. *British Journal of Educational Psychology*, Vol. 74, pp. 281-296. DOI: [10.1348/000709904773839888](https://doi.org/10.1348/000709904773839888)
- Leo, E.L. & Galloway, D. (1996). Evaluating research on motivation: generating more heat than light? *Evaluation and Research in Education*, Vol. 10, I, 35-47. DOI: [10.1080/09500799608666904](https://doi.org/10.1080/09500799608666904)
- Maehr, M.L. & Pintrich, P.R. (1991). Advances in motivation and achievement: goals and self-regulatory processes. In Anerman, E.M. & Maehr, M.L. (1994). Motivation and schooling in the middle grades. *Review of Educational Research*, Vol. 64, pp. 287-309.
- Marsh, H.W. (1989). Age and sex effects in multiple dimensions of self-concept: pre-adolescence to early adulthood, *Journal of Educational Psychology*, Vol. 81, 3, pp. 417-430. DOI: [10.1037//0022-0663.81.3.417](https://doi.org/10.1037//0022-0663.81.3.417)
- Meece, J.L., Blumenfeld, P.C. & Holye, R.H. (1988). Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology*, Vol. 80, pp. 514-523. DOI: [10.1037//0022-0663.80.4.514](https://doi.org/10.1037//0022-0663.80.4.514)

- Michaels, J.W., & Mieth, T.D. (1989). Applying theories of deviance to academic cheating. *Social Science Quarterly*, Vol. 70, pp. 870-885.
- Midgley, C., Feldlaufer, H. & Eccles, J.S. (1989). Student/teacher relations & attitudes toward mathematics before and after the transition to junior high school. *Child Development*, Vol. 60, 4, pp. 981-992. DOI: [10.2307/1131038](https://doi.org/10.2307/1131038)
- Midgley, C., Anderman, E.M., & Hicks, L. (1995). Differences between elementary and middle school teachers and students: a goal theory approach. *Journal of Early Adolescence*, Vol. 15, pp. 90-113. DOI: [10.1177/0272431695015001006](https://doi.org/10.1177/0272431695015001006)
- Murdock, T.B., Hale, N.M. & Weber, M.J. (2001). Predictors of cheating among early adolescents: academic and social motivations. *Contemporary Educational Psychology*, Vol. 26, pp. 96-115. DOI: [10.1006/ceps.2000.1046](https://doi.org/10.1006/ceps.2000.1046)
- Nicholls, J.G. (1979). Quality and equality in intellectual development: the role of motivation in education. *American Psychologist*, Vol. 34, 11, pp.1071-1084. DOI: [10.1037//0003-066X.34.11.1071](https://doi.org/10.1037//0003-066X.34.11.1071)
- Nicholls, J.G. (1984). Achievement motivation: conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, Vol. 91, 3, pp. 328-346. DOI: [10.1037//0033-295X.91.3.328](https://doi.org/10.1037//0033-295X.91.3.328)
- Nicholls, J.G. & Miller, A.T. (1984). Development and its discontents: the differentiation of the concept of ability. In Nicholls, J.G. (Ed). *Advances in motivation and achievement*, Vol.3, pp. 185-218. *The development of achievement motivation*. Greenwich, CT: JAI Press.
- Nolen, S.B. (1988). Reasons for studying: motivational orientations and study strategies. *Cognition and Instruction*, Vol.5, pp. 269-287. DOI: [10.1207/s1532690xci0504_2](https://doi.org/10.1207/s1532690xci0504_2)
- Nolen, S.B. & Haladyna, T.M. (1990). Motivation and studying in high school science. *Journal of Research in Science Teaching*, Vol. 27, pp. 12-21. DOI: [10.1002/tea.3660270204](https://doi.org/10.1002/tea.3660270204)

- Pajares, F. & Miller, D. (1994). Role of self-efficacy and self-concept beliefs in mathematical problem solving: a path analysis. *Journal of Educational Psychology*, Vol.86, 2, pp. 193-203. DOI:[10.1037//0022-0663.86.2.193](https://doi.org/10.1037//0022-0663.86.2.193)
- Pajares, F. (2002). Gender and perceived self-efficacy in self-regulated learning. *Theory into Practice*, Vol. 41, 2, pp. 116-125. DOI: [10.1207/s15430421tip4102_8](https://doi.org/10.1207/s15430421tip4102_8)
- Petersen, A.C., & Taylor, B. (1980). The biological approach to adolescence: Biological change and psychological adaptation. In J. Adelson (Ed.), *Handbook of adolescent psychology*, New York: Wiley
- Pintrich, P.R. & De Groot, E.V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, Vol. 82, pp. 33-40. DOI: [10.1037//0022-0663.82.1.33](https://doi.org/10.1037//0022-0663.82.1.33)
- Rainer, P. & Cropley, B. (2013). Bridging the gap- but mind you don't fall. Primary physical education teachers' perceptions of the transition process to secondary school. *Education 3-13*, Vol. 41, 6, pp. 1-17. DOI: [10.1080/03004279.2013.819026](https://doi.org/10.1080/03004279.2013.819026)
- Roderick, M. (1992). School transitions and school dropout: middle school and early school antecedents to school leaving. In Anderman, E.M. & Midgley, C. (Eds) (1997) Changes in achievement goal orientations, perceived academic competence, and grades across the transition to middle-level schools. *Contemporary Educational Psychology*, Vol.22, pp. 269-298.
- Ryan, R.M. & Connell. J.P.(1989). Perceived locus of causality and internalization: examining reasons for acting in two domains. *Journal of Personality and Social Psychology*, Vol. 57, pp. 749-761. DOI: [10.1037//0022-3514.57.5.749](https://doi.org/10.1037//0022-3514.57.5.749)
- Schafer, R. (1968). *Aspects of internalization*. New York: International Universities Press.

- Scouller, K.M. (1996). Influence of assessment method on students' learning approaches perceptions and preferences: the assignment essay versus the short answer examination. *Research and Development in Higher Education*, Vol. 19, pp. 776-781. DOI: [10.1023/A:1003196224280](https://doi.org/10.1023/A:1003196224280)
- Scouller, K.M. (1998). The influence of assessment method on student's learning approaches: multiple choice question examination versus assignment essay, *Higher Education*, Vol. 35, pp. 453-472.
- Simmons, R.G., Blyth, D.A., Van Cleave, E.F. & Bush, D. (1979). Entry into early adolescence: the impact of school structure, puberty, and early dating on self-esteem. *American Sociological Review*, Vol. 44. pp. 948-967. DOI: [10.2307/2094719](https://doi.org/10.2307/2094719)
- Thomas, D. (1975). *Picasso and his art*. New York: Galahad.
- Urdu, T. & Turner, J.C. (2005). Competence motivation in the classroom. In, Elliot, A.J. & Dweck, C.S. (Eds). *Handbook of Competence and Motivation*. London: Guilford Press.
- Warburton, V. & Spray, C. (2008). Motivation in physical education across the primary-secondary school transition. *European Physical Education Review*, Vol. 14, 2, pp. 157-178. DOI: [10.1177/1356336X08090704](https://doi.org/10.1177/1356336X08090704)
- Wigfield, A., Eccles, J.S., MacIver, D., Reuman, D.A. & Midgley, C. (1991). Transitions during early adolescence: changes in children's domain-specific self-perceptions and general self-esteem across the transition to junior high school, *Developmental Psychology*, Vol. 27, 4, pp. 552-565. DOI: [10.1037//0012-1649.27.4.552](https://doi.org/10.1037//0012-1649.27.4.552)
- Wigfield, A., Eccles, J.S., & Pintrich, P.R. (1996). Development between the age of 11 and 25. In Berliner, D.C. & Calfee, R.C. (Eds). *Handbook of educational psychology* (p. 148-185) New York: Simon & Schuster Macmillan.
- Wigfield, A., Eccles, J.S., Yoon, K.S., Harold, R.D., Arbreton, A., Freedman-Doan, K. & Blumenfeld, P.C. (1997). Changes in children's competence belief and subjective task values across the elementary

school years: A three-year study. *Journal of Educational Psychology*, Vol. 89, pp. 451-469.

Zanobini, M. & Usai, M.C. (2002). Domain-specific self-concept and achievement motivation in the transition from primary to low middle school. *Educational Psychology*, Vol. 22, 2, pp. 203-217. DOI: [10.1080/01443410120115265](https://doi.org/10.1080/01443410120115265)

Zeedyk, S.E., Gallacher, J., Henderson, M., Hope, B., Husband, B. & Lindsay, K. (2003). Negotiating the transition from primary to secondary school: perceptions of pupils, parents and teachers. *School Psychology International*, Vol.24, 1, pp. 67-80. DOI: [10.1177/0143034303024001010](https://doi.org/10.1177/0143034303024001010)

Cheng-Yu Hung is PhD Candidate in the Faculty of Education at the University of Cambridge.

Contact Address: Queen's College, Cambridge, CB3, 9ET, United Kingdom. E-mail address: cyh26@cam.ac.uk

The Role of ITs in Improving Teaching Quality in Schools: A Multicase Study

José Luis Aróstegui
Universidad de Granada

José Luis Guerrero
Universidad de Granada

Abstract

In this paper we reflect, starting from empirical data, on the impact of Information Technology (IT) in curriculum development and in shaping teachers' professional identities. Based on two case studies carried out in two Secondary-Education classrooms located in southern Spain, we study the use that each of these teachers made of IT and how their identities are reflected in the use of these tools and, at the same time, how to conform them. The first case is an illustration of transition from a content-based curriculum approach to another centered on students mainly by means of IT. As for the second, it shows how these resources allow this teacher to deepen the democratic principles of teaching he uses in class and on the Internet too, by and large through social networks. Based on our findings we conclude that, at least in the case of these two teachers, ITs represent a clear improvement in the quality of their teaching when they are focused on the educational application of the resource rather than on its technical side.

Keywords: Information Technologies, Secondary Education, Music Education, Science Education, curriculum.

El Papel de las TIC en la Mejora de la Calidad Docente en Secundaria: Un Estudio Multicasos

José Luis Aróstegui
Universidad de Granada

José Luis Guerrero
Universidad de Granada

Resumen

En este artículo reflexionamos, a partir de datos empíricos, sobre la influencia de las Tecnologías de la Información y la Comunicación (TIC) para el desarrollo del currículo y la conformación de las identidades docentes. A partir de dos estudios de caso realizados en dos aulas de Educación Secundaria Obligatoria de otros tantos Institutos del sur de España, estudiamos el uso que cada uno de estos docentes hace de las TIC y cómo sus identidades se reflejan en el uso de las mismas y, al mismo tiempo, cómo éstas contribuyen a conformarlas. El primero es un ejemplo de transición de un enfoque educativo centrado en los contenidos a otro centrado en el estudiante gracias a las TIC, mientras que para el segundo estos recursos le permiten profundizar en los principios democráticos de enseñanza que emplea en el aula y ahora también en internet, sobre todo en las redes sociales. De nuestros datos cabe concluir que, al menos en el caso de estos dos profesores, las TIC suponen una clara mejora en la calidad de su práctica docente al centrarse en la aplicación pedagógica de los recursos antes que en el recurso en sí mismo.

Palabras clave: Tecnologías de la Información y la Comunicación, Educación Secundaria, Educación Musical, Educación en Ciencias Naturales, currículo.



En este artículo reflexionamos, a partir de datos empíricos, sobre la influencia de las Tecnologías de la Información y la Comunicación (TIC) para el desarrollo del currículo y la conformación de las identidades docentes. A partir de dos estudios de caso realizados en dos aulas de Educación Secundaria Obligatoria de otros tantos Institutos del sur de España, estudiamos el uso que hace cada uno de estos docentes de las TIC y cómo sus identidades se reflejan en el uso de las mismas y, al mismo tiempo, cómo éstas contribuyen a conformarlas. Al centrarnos en el estudio del contexto, nuestra intención no es generalizar los resultados obtenidos, y sí, en cambio, mostrar dos ejemplos de cómo el concepto de educación de cada uno de estos docentes perfila un uso diferenciado de las TIC mostrando, por tanto, cómo éstas son mucho más que el empleo de una máquina, sino otro modo más que refleja y, al mismo tiempo, conforma, las identidades profesionales de los docentes.

El enfoque metodológico investigador que empleamos es cualitativo. Concretamente se trata de un enfoque multicazos ([Stake, 2013](#)) consistente en tratar de valorar, desde una visión de conjunto, todos los matices, descripciones e interpretaciones de cada uno de los casos, lo que en este artículo se concreta en cómo las TIC conforman la acción docente de cada profesor estudiado y, por tanto, su identidad como docentes. En absoluto pretendemos comparar los casos, lo que epistemológicamente no tiene sentido en investigación cualitativa, ya que nos centramos en los contextos, y sí proporcionar una visión global de entre los casos singulares que aportará comprensiones propias.

Con tal fin presentamos en primer lugar una revisión de la literatura pedagógica que nos sirve de soporte para el análisis e interpretación de los datos de cada caso para, a continuación presentar aquellas partes de cada estudio que son relevantes para llegar a las reflexiones y conclusiones que

exponemos en la última sección, y que podría resumir en las posibilidades de innovación que tienen las TIC en educación y que van más allá del empleo de una tecnología u otra sino, fundamentalmente, en la mejora de la calidad de la docencia.

A la hora de exponer los datos hemos procurado mantener el anonimato de los docentes estudiados aunque probablemente no lo hayamos conseguido en el segundo caso. Las referencias que hacemos a las redes sociales y a su actividad personal y profesional tal vez le haga identificable para que quienes estén igualmente involucrados en los contextos educativos y en los de dichas redes. Contamos, en cualquier caso, con su aprobación para difundir los datos que aparecen en este artículo, pues el informe de investigación de donde provienen estos datos se negoció con él. En cuanto al primer profesor, se trata de un estudio de caso en su fase final. La publicación de los datos que aparecen en este artículo se han negociado con él, habiéndose igualmente obtenido su visto bueno.

Revisión teórica

La inserción de las Tecnologías de la Información y la Comunicación en la enseñanza se está llevando a cabo desde hace tiempo con la creación de los llamados *Centros TIC* o con programas tipo *Escuela 2.0*. Para que esta integración de las TIC se lleve a cabo hace falta, además de la disponibilidad de estos recursos, una adecuada formación del profesorado, lo que a su vez hace que algunos investigadores estudien cómo el profesorado hace frente a este reto de la integración de las TIC y cómo le está dando una función educadora, pues “el desarrollo tecnológico y las nuevas formas de comunicación en las que estamos inmersos socialmente están configurando y reclamando un nuevo espacio educativo, un replanteamiento de las finalidades de la educación y de los propios procesos de enseñanza” (Quintero y Hernández, 2005, p. 306).

Esta adaptación no es sólo una cuestión de emplear las nuevas posibilidades que permiten estos recursos, tampoco de que la escuela asuma la capacitación del alumnado para usarlas, que también, sino que viene motivada fundamentalmente por los nuevos modos digitales de comprensión e interacción de la realidad que tienen las nuevas generaciones y que ha dado lugar a una “brecha digital” expresada por diferentes teorías y metáforas como las de los “inmigrantes” y “nativos” digitales (Prensky, 2001), la de “residentes” o “visitantes” también digitales (White & Le Cornu, 2011) o la de la “Generación Red” (Oblinger et al., 2005), en referencia a los nacidos a partir de 1990 y que han crecido con Internet y que hace que en numerosas ocasiones el alumnado sea más competente que el profesorado en el empleo de las tecnologías. Ante este nuevo modo de concebir el mundo, el profesorado tiene que darle respuestas y ofrecer nuevos modos de concebir los procesos de enseñanza-aprendizaje:

Los miembros de la “Generación Red” están “hambrientos de expresión, de descubrimiento y de autodesarrollo”: son atrevidos, independientes, analíticos, creativos, curiosos, respetuosos con la diversidad, socialmente conscientes, orientados globalmente, y todo ello, a lo que parece, en virtud de su relación intuitiva con la tecnología (Buckingham, 2005, p.46).

En una investigación llevada a cabo en el Reino Unido sobre el empleo que hace el profesorado de música de las TIC (Savage, 2007), se encontró que el 39% reconocía que sus estudiantes sabían más que ellos sobre determinados aspectos tecnológicos, datos que a buen seguro pueden extrapolarse al conjunto del profesorado y a otros países. Urge, por tanto, una capacitación del profesorado tanto en el dominio de las TIC como en su aplicación pedagógica, las dos grandes competencias que autores como Law y Chow (2008) consideran que debe tener el profesorado a este respecto, siendo la pedagógica a la que le dan mayor importancia, al tiempo que

encuentran un nivel bajo de competencia del profesorado y un escaso uso de los recursos tecnológicos en los estudios que han realizado. Concluyen que el profesorado es más un usuario de materiales curriculares que un productor de los mismos.

De no conseguirse ambas capacitaciones, en el manejo de la herramienta y en su aplicación pedagógica, ya sea, por “no contemplar una política clara de planes de formación inicial y permanente del profesorado en TICs, [o] por [...] realizar la formación del profesorado en TICs, exclusivamente desde una óptica técnico-instrumental” (Cabero, 2005, p.1), lleva a que no se usen en clase o, como señala Area (2010, p. 93), a que “el uso de los ordenadores y demás tecnologías digitales, en la gran mayoría de las ocasiones, no se [traduzca] en un replanteamiento significativo y radical del modelo didáctico empleado”, que fue lo que encontró en una investigación sobre el uso de las TIC por parte del profesorado canario y que, según indica este autor, está en consonancia con resultados similares encontrados en otras investigaciones nacionales e internacionales.

Datos empíricos

Primer caso¹: de la reproducción del conocimiento al desarrollo competente del alumnado.

El primer estudio de caso al que nos vamos a referir se ha llevado a cabo en un aula de música de un Instituto Público de Educación Secundaria. El profesor, al que aquí llamaremos Pepe, tiene una sólida formación musical. Cursó estudios de trompeta en el conservatorio que, una vez finalizados, le permitieron empezar a trabajar como profesor en esta misma rama de las enseñanzas de régimen especial. Sus intereses iban por la interpretación,

como es habitual en la mayor parte de los estudiantes de conservatorio. Como él mismo dice:

Verdaderamente yo nunca quise ser profesor de música,..., yo no tenía vocación para trabajar en un instituto, ni siquiera en un conservatorio. Como oficio era muy duro de llevar para mí, porque además es que, cuando tienes 21 o 22 años en realidad, estás en edad de aprender y no de enseñar, cuando hablas de música ¿no?

Al final, y por sentirse “muy presionado por el entorno”, decide presentarse a las oposiciones de Educación Secundaria de Música aunque “a mí lo que me habría apetecido es estudiar fuera y aprender a tocar la trompeta, reaprender”.

Una vez aprobadas las oposiciones, pide una excedencia y se dedica a la música antigua, su pasión, decantándose por estudiar el *cornetto*. Tras realizar varios cursos en España, acaba yéndose al Conservatorio de Lyon, lo que hizo “sin ninguna intención de sacarme título ni nada, sino solamente por el gusto de trabajar con mi profesor. Allí me relacioné con mucha gente de la música antigua, me metí un poco en ese mundillo, lo que pasa es que era difícil vivir solamente de eso, muy difícil...y vuelvo a mi trabajo después de la excedencia”. Vuelve así a España y comienza su andadura en el IES en donde actualmente trabaja como profesor.

La trayectoria formativa y musical de Pepe sin duda influye en su concepción de la música como parte del currículo escolar. Aunque parte de una idea de la educación “más clásica que otra cosa”, según él mismo la define, piensa que, “para dar clase yo debería abandonar la pretensión de que los niños distinguieran un villancico del Renacimiento de un motete”, cosa que en parte ya hace, pues al menos piensa que “lo que cuenta es el tipo de relación que tengas con los niños, es una cuestión de comunicación más que de repertorio”.

De un profesor con una trayectoria formativa centrada en el contenido musical y que quiso dedicarse a la música antigua y que acabó dedicado a la docencia cabría anticipar una concentración en los contenidos más conceptuales. En parte parece ser así, tal como se desprende de la cita anterior, aunque además le importa el proceso educativo o, como él dice, la comunicación con sus estudiantes a través de la música y lo que, por otra parte, es lo esencial a ella, es decir, lo artístico y estético. O, dicho con sus propias palabras: “la música hace más feliz a las personas, tan sencillo como eso, no hay que darle más vueltas”.

En esta transición en su biografía de músico a docente influyeron cursos de formación pedagógica de corte instrumental, de entre los que menciona expresamente los cursos que realizó de percusión corporal y, sobre todo, el empleo de las TIC en el aula. Estas y otras experiencias marcarán la forma en que imparte sus clases, qué prioriza en ellas y su concepto de la educación en general y de la musical en particular.

Así, la implantación progresiva del programa *Escuela 2.0* hace que Pepe se interese desde hace tres años por las TIC: “desde el momento que tengo un ordenador en el aula, a pesar de que yo soy más bien un torpe informático, me intereso por este mundo que es muy emergente, muy nuevo y muy creativo”. Realiza entonces cursos relacionados con las TIC y conoce a colegas que trabajan en el aula de música con estos recursos, además con muy buenos resultados. Podríamos calificar esta etapa como “temprana” en la manera que Pepe se interesa por el mundo de las TIC, realiza cursos y se informa.

La segunda etapa sucede cuando se traslada de unas aulas prefabricadas a la biblioteca (actualmente usada como aula de música), lo que le ha posibilitado realizar prácticamente todas las actividades posibles con las TIC, con el consiguiente cambio cualitativo y cuantitativo a la hora de poner en práctica actividades y metodologías, fase en el uso de las TIC de este

profesor que podríamos llamar de “integración” en el aula, al poder integrar todo lo aprendido en los cursos de formación recibidos y tener las infraestructuras adecuadas para aplicarlas. Así, en clase usa su tableta *iPad* como único material de trabajo en aula, con la que emplea la plataforma *Moodle*, donde tiene los contenidos de los dos cursos a los que imparte (1º y 2º de ESO), además de un *blog* o bitácora de clase en donde suele subir aquellas actividades realizadas por el alumnado. No usa libro de texto, sobre el que comenta:

Del libro de texto esperamos siempre grandes cosas y, a veces, las encontramos. Otras, no son aplicables. No estoy en contra, sólo que me resulta más cómodo elaborar yo mismo los contenidos. Trabajar sin libro de texto te da una posibilidad de flexibilizar tu trabajo... El libro de texto te dirige, por eso yo ya no lo uso.

Y esa flexibilidad es la que le permiten las TIC, razón ésta por la que están muy presentes en sus clases. En ocasiones crea actividades propias y en otras las toma de la internet, de compañeras muy conocidas en el mundo de las TIC en educación musical gracias fundamentalmente a las redes sociales y a las bitácoras en donde alojan esas actividades. Pepe también realiza actividades creativas de composición con el editor de partituras en línea *Noteflight*.

En la actualidad este profesor se encuentra en proceso de transición hacia una tercera etapa que podríamos llamar “crítica”, de reflexión sobre su labor docente, y que toma en perspectiva lo que él hace en el aula y en el que está conectando más con sus experiencias musicales y personales y reconstruyendo el empleo que hasta ahora ha hecho de las TIC: “quizás he pecado de trabajar demasiado con las TIC estos dos últimos años; de vez en cuando hay que dejar que los niños se expresen de otra manera y no tiene por qué ser un ordenador”. Tal vez por eso dice estar empleando ahora más

que en cursos anteriores otros recursos de aplicación al aula, y que Pepe valora mucho y utiliza en clase, sobre todo en 1º de ESO, como es la percusión corporal, recurso “muy lúdico y muy interesante, perfectamente compatible con las TIC”.

Volviendo a la cuestión del empleo de las tecnologías en el aula, no considera suficiente que el alumnado haga determinadas operaciones, como bajar un archivo o entrar en una plataforma, para que la actividad sea educativa, aspectos éstos que considera el primer paso y, a partir de ahí, “trabajar un montón de competencias”:

No es una cuestión de decir entra en la *Moodle* y bájate este archivo, sino de decirles entra en la *Moodle*, sigue estas instrucciones, descárgate tal cosa, aprende a utilizar tales herramientas, ahora con estas herramientas me haces esto, selecciona información de este sitio, ¿entiendes? [...].

Si [el alumnado] aprende a hacer una página web y luego, puede hacer otra para relacionarse socialmente o para hacer cualquier tipo de trabajo, si encima esa página está en inglés... eso es enormemente útil. En este sentido las TIC son muy importantes, sobre todo por la proyección creativa que tiene, más que como soporte.

En sus clases emplea el ya mencionado editor de partituras en línea denominado *Noteflight*. Con éste hace una actividad donde el alumnado tiene que crear una pequeña y sencilla melodía. Es una actividad en la que les pone límites, hay dirección, y en la que a su vez disponen de muchas y variadas posibilidades para realizarla. Al respecto de dicha actividad comenta el valor educativo de la misma de la siguiente manera:

Aunque tengan cuatro ideas, al final, acabarán por fuerza aprendiendo que dos corcheas valen una negra, porque es que si no, el programa te rechaza cualquier operación... Entonces digamos que, subliminalmente, están aprendiendo música.

Como podemos observar, existe un proceso crítico donde es posible dilucidar su concepto de educación, ya sea con las TIC o sin ellas; busca la formación autónoma de su alumnado sin renunciar a cierta direccionalidad y persigue el desarrollo de competencias generales de todo el currículo, como el bilingüismo, el trabajo colaborativo o el manejo de las TIC, aunque de sus palabras se desprende que “estar aprendiendo música” siguen siendo los contenidos conceptuales, al equiparar que “acabarán por fuerza aprendiendo que dos corcheas valen una negra” con que “están aprendiendo música”, lo cual es rigurosamente cierto, pues se trata de un contenido conceptual básico de la música, pero que no deja de contrastar con esa concepción formativa que explicita y que también lleva a la práctica más basada en el desarrollo de competencias educativas y que, en realidad, están ahí, al animarles a crear melodías, por ejemplo.

Cabe pensar, en cualquier caso, que el profesor sigue fiel a sus raíces formativas musicales, al tiempo que parece haber habido una clara evolución hacia un enfoque centrado en las posibilidades educativas de la música gracias, entre otras circunstancias, a las TIC.

Segundo caso²: El uso docente de las redes sociales para una educación democrática.

El segundo estudio de caso se realizó en una aula de Ciencias Naturales de otro Instituto de Educación Secundaria. El profesor tiene una amplia trayectoria profesional y de empleo de las TIC y de las redes sociales: *Facebook*, *Google+* y *Twitter*.

Como paso previo que nos permitiera poner en contexto el modo en que este profesor emplea las redes sociales, hicimos una indagación sobre el uso que hace el profesorado de *Twitter*. Nos centramos en esta red por la posibilidad de dirigirse a otros usuarios sin necesidad de que te acepten

como “amigos”, lo que aumenta así la cantidad de personas a las que uno se puede dirigir, y también por ser la que en principio parece tener un uso más profesional.

Nada más entrar en *Twitter* es fácil comprobar, con tan sólo observar las principales etiquetas que se emplean para temas educativos,³ que, como mínimo, se utiliza como herramienta de comunicación entre el profesorado y de formación permanente. Las potencialidades de las redes sociales son enormes pues enseguida se puede encontrar alguien con tus mismos intereses en educación musical, bibliotecas escolares, etcétera, aunque sin duda el interés por las TIC destaca sobre el resto. El énfasis en productos, es decir, en actividades de aula desarrolladas además en su inmensa mayoría a través de las TIC, es igualmente mayoritario.

Además de este análisis de los mensajes que circulan por *Twitter*, les pedimos al profesorado de Secundaria de nuestras cuentas en *Twitter*, y también a los que siguen esas etiquetas de educación más frecuentes, que nos dijeran cómo lo emplean a nivel docente, debiendo dejar la respuesta con la etiqueta #usodocente. Recibimos numerosas respuestas que tal vez podrían resumirse en esta:

Gracias a *Twitter* puedo compartir ideas con compañeros, aprender cosas y sentir que formo parte de algo importante: la educación #usodocente.⁴

Como vemos, la idea implícita es la de la identidad docente, es decir, la de sentirse miembro de un colectivo con el que se comparte una visión de lo que es la educación y que, como toda identidad, está en continuo proceso de re-construcción gracias a la formación permanente y que por mor de las redes sociales se hace entre iguales y voluntariamente.

Luis, el profesor de nuestro estudio de caso es muy activo en el uso de redes sociales, las emplea tanto a nivel personal, en donde muestra un fuerte compromiso político y social, y a nivel docente. A nuestro requerimiento de

ayuda a la comunidad docente *twitera* él también respondió, sin saber que en principio esta indagación estaba relacionada con la investigación presencial que se estaba realizando en su aula. Su respuesta fue en este mismo sentido del uso de *Twitter* como herramienta que ayuda a conformar su identidad docente y de formación permanente al compartir recursos propios con los demás:

Es una manera tanto de contar cosas q veo x si interesan como de mirar con los ojos de otra gente. Y así sintonizar... #usodocente.

Es una manera de obligarme a ser coherente. No puedo hacer cosas distintas de las que digo que hago... #usodocente.

Este último mensaje no nos quedó claro: ¿qué relación hay entre ser coherente con lo que se hace en el aula y estar en contacto con otros colegas a través de las redes sociales? Le preguntamos y esto fue lo que respondió:

Si cuento los principios q rigen lo q hago, eso m obliga n mi acción de aula. Coherencia twitter-IES #usodocente.

En definitiva, explicitar y verbalizar nuestras creencias y convicciones sobre, en este caso, educación, hace que evitemos una reproducción de hábitos de intervención inarticulados. Podría valer cualquier otro punto de encuentro, pero las redes sociales posibilitan esa permanente re-construcción colectiva de significados acerca de lo que es la educación con otros colegas que comparten idénticas inquietudes a las nuestras.

La mayor parte de los mensajes que recibimos ahondaron en esta línea de contacto con otros colegas con los que compartimos puntos de vista y de sentimiento de comunidad *twitera* y educativa. Muy pocos dijeron que usaran esta red con el alumnado, de hecho parece haber acuerdo en que el alumnado prefiere las bitácoras y *Facebook*:

[Twitter] es todavía un medio social en desventaja respecto *Facebook*, pero eficaz, según alumnado primer ciclo #usodocente

Otros docentes informaron de algunas experiencias concretas (sobre todo relacionadas con el aprendizaje de idiomas, francés e inglés), pero que claramente eran escasas en comparación con otras redes y recursos.⁵ El profesor objeto de estudio de este caso creó sus propias etiquetas para usar el aula, de hecho cada grupo al que le daba clase tenía la suya propia que, en el caso del aula estudiada era #bio2bcv que, sin embargo, no tuvo prácticamente uso. De hecho, sólo encontramos un mensaje de un estudiante durante el periodo de observación:

Voy a ser creador de mocos artificiales #bio2cv.

Además de este mensaje que refleja un buen ambiente de clase, el profesor puso otro mensaje:

Tengo que confesar una cosa: estoy irascible con mi alumnado. Y no se lo merecen. El lunes toca pedirle disculpas. Sin excusas. #bio2bcv.

La situación de aula que lleva al profesor a escribir este mensaje no viene al caso para los propósitos de este artículo, y sí preguntarnos qué le lleva a hacer esta introspección pública ante los seguidores de su cuenta o a quien acceda a ella, y concretamente ante su alumnado, que es quien en principio emplea la etiqueta #bio2bcv. Durante la entrevista que mantuvimos con él le preguntamos por este particular:

Mira, yo he visto una cosa muy clara en mi trabajo y es que, cuando tú llevas un trabajo que no es estándar, la transparencia te protege. Y fíjate, no la visibilidad, la transparencia, que son dos elementos diferentes [...]. Este año

he decidido que no voy a contar en el blog lo que estoy haciendo, si acaso en *Twitter*, pero en menor cantidad que el año pasado, sobre todo porque ya se está repitiendo mucho de lo que hacía. Al final lo que haré será transmitir algunas de las conclusiones de lo que voy haciendo. Pero me parece que la transparencia es muy importante porque te protege, porque deja muy claro qué estás haciendo y por qué, y la transparencia no es visibilidad. La visibilidad es acomodaticia, en el sentido de que yo elijo. Yo tengo que elegir transparencia porque creo que es lo coherente con llevar un modo de trabajo que sea distinto, debes una explicación acerca de lo que estás haciendo a aquellas personas con las que estás trabajando. Por mucho que yo esté convencido de que la posición mía está muy bien recogida en la Ley [en el currículo], sobre todo después de haber estado trabajando en la Consejería [de la Junta de Andalucía]. Yo creo que mi posición está muy conectada con mucho de lo que dice la Ley, pero no tanto con mucho de lo que dice la costumbre. Por tanto, le debo una explicación a la gente, y la explicación no puede ser elegible. Y la transparencia, además de protegerme, me obliga. A mí me parece que la transparencia es un elemento de obligación acerca de lo que debo hacer: tengo unos principios, los he dejado muy claros, y ahora aparecerán contradicciones, pero las contradicciones las tengo que resolver.

Es decir, por un lado, se siente obligado a rendir cuentas de su trabajo, para lo bueno y para lo malo, como servidor público que es, y más que nadie a su alumnado, que es a quienes directamente sirve este funcionario docente. Es, por tanto, un planteamiento a todas luces democrático y coherente con los principios de un servicio público, de una escuela pública que ha de rendir cuentas de su trabajo a quienes la pagamos con nuestros impuestos. Por otro, hace público su introspección como docente “para protegerse”, ya que es consciente de que innovar como él hace conlleva un riesgo, pero no para él, sino como posible generador de conflictos, en caso de que algo falle:

Somos miembros de una sociedad [...] y veo que cuanto más me comunico y más me explico, mejor me entienden. Bueno, creo que la falta de entendimiento es uno de los elementos de los conflictos. Por eso veo un

riesgo en cuanto a conflictos, que no en cuanto a consecuencias. El número de conflictos, cuando uno es transparente, la experiencia que yo tengo es que disminuye sustancialmente.

Hay otra etiqueta en *Twitter* relacionada con este profesor que tuvo mucho movimiento, #Isolutions, creada por una antigua alumna que en el momento de hacer la recogida de datos para esta investigación –curso 2011/2012– cursaba 2º de ESO, y que creó con el fin de hablar de las dinámicas de aula entre estudiantes de ese Instituto y este profesor, también para tratar cuestiones relacionadas sobre el contenido de la asignatura que imparte Luis. Por ejemplo, sobre esta última cuestión, tenemos la siguiente conversación:

necesito una #Isolutions para saber que es la energía??

A lo que el profesor le responde en la misma línea que emplea en clase, que es el alumnado quien debe buscar sus respuestas a sus necesidades de aprendizaje, del que él es un facilitador:

La solución a tus problemas con la idea de energía la tiene el alumnado, no yo XDDD ciencias-n-miguel.blogspot.com/2011/10/papel-... #Isolutions.

Hubo alguna que otra cuestión sobre los electrones, o alguien que quiso saber si la lavanda es un arbusto o una hierba, pero son minoría comparado con el enfoque más centrado en su metodología de aula. Un mensaje del propio profesor lo define así:

Creo q #Isolutions, tag creado x antiguxs (y espero q futuro) alumnxs míos, s intento d democracia participativa n IES. S decir, auténtica.

Mensaje dirigido, a nuestro entender, no tanto a su alumnado, como a cualquier seguidor de los que tiene este profesor en *Twitter* y que, por tanto recibe estos mensajes. De hecho en estos debates metodológicos está implicando a otros docentes de otros IES pues, como él mismo escribió:

Si trabajas en educación no te pierdas el hashtag #Isolutions ¡imprescindible!

Lo que a su vez lleva al profesor a cuidar a estos y estas estudiantes menores de edad:

Suscribo 100% sto q dice mi amigo @SrJosepTomas... La gente de #Isolutions os podéis fiar de él :) Al 110% :).

Yendo al contenido de los mensajes, encontramos una relación muy fresca entre este alumnado y el profesor, al que le plantean cuestiones pedagógicas de calado:

Pq si profes ven q si aprendiendonos cosas d memoria se ns olvida, siguen haciéndolo? Qué asco! #Isolutions.

Comentario que, como en este caso, el alumno puede hacer en general o también concretar en este profesor:

[mensaje de alumna] Algunos profesores saben como dominar la clase, bueno todos saben, pero unos mas que otros. #Isolutions.

[respuesta del profesor] Creo q no s cuestión d dominar. No dbería. Más bien acordar fncionamiento y aplicarlo ntre todxs #Isolutions.

Aunque yo regaño (muy) fuerte SÍ (insisto, SÍ) quiero democracia n clase. Aunq debo mejorar, lo sé #Isolutions.

En definitiva, este profesor emplea *Twitter*, por un lado, tal como parece que lo hace la mayor parte del profesorado, en tanto en cuanto la emplea como herramienta de formación permanente y de sentimiento de comunidad docente, interesada además por las TIC. Tal vez la diferencia más significativa con el uso mayoritario es que no parece interesarle demasiado los recursos tecnológicos y educativos *per se*, aunque desde luego los emplea, pero su centro de interés no está ahí, sino en emplear en *Twitter* los mismos principios reflexivos que emplea en clase para la enseñanza de su asignatura, pues procura facilitar el trabajo de autoformación del estudiante antes que dar directamente la respuesta a sus preguntas, y, sobre todo, fomenta la democracia participativa como principio de actuación educativa. Esta emancipación educativa que promueve en contenidos y metodología sería posible sin el uso de las TIC, aunque sin duda estos recursos permiten desarrollarlo. El uso democrático de las Tecnologías se incrementa aún más al emplear las redes sociales para someter su trabajo como docente al escrutinio público.

Análisis multicasos: las TIC como herramienta de transformación docente

Muchos son los autores (v.g., [Murillo, 2010](#); [Aróstegui, 2011](#)) que han denunciado el enfoque mercantilista del programa *Escuela 2.0*. Así mismo, en investigaciones que se desprenden de proyectos relacionados, como el *Medusa*, del Gobierno de Canarias ([Area, 2010](#)), ya hemos visto que el uso de las TIC no ha supuesto cambio significativo del modelo didáctico empleado en el aula. Los casos de los dos profesores reseñados en este artículo son la otra cara de la moneda; la de las posibilidades de mejora de la acción docente gracias a las TIC cuando se dan las condiciones adecuadas.

Aunque son personas con diferentes trayectorias vitales y profesionales que provienen de contextos muy diversos, parecen ir en una dirección de innovación y mejora docente parecidas gracias a las TIC. Ninguno de los dos se preocupa directamente por el recurso en sí; manejar el ordenador para abrir un programa o bajarse un documento de internet son capacidades que se dan por supuestas para ir más allá en su trabajo como docentes, entendido como hacer competente a su alumnado en las capacidades que el currículo prevé para la Educación Secundaria. No importa que uno, Pepe, se perciba como un *torpe informático* (sic) o que Luis, aunque no lo manifieste expresamente, tenga un claro dominio de las TIC y que éstas formen parte de su identidad personal y profesional desde hace mucho tiempo; los dos, por caminos distintos, buscan darle a su alumnado una formación de calidad gracias, entre otros recursos, a las TIC.

En el caso del primer profesor referido, las TIC han supuesto un elemento de transformación docente, un cambio desde su formación como músico que se interesaba por esta materia centrada en los contenidos más conceptuales, aunque también le importara desde siempre el componente artístico y comunicativo de la música. De interesarse por que su alumnado sepa lo que es una negra y una corchea a emplear estos conceptos como recursos que acabarán sabiendo mediante la composición musical a través de un editor de partituras en línea hay un mundo, que repercute en qué enseña este profesor y en qué aprende su alumnado. Cabría pensar que, desde su interés primero por el objeto musical y luego por el informático, ahora se encuentra en un momento en el que lo que le importa en primera instancia es qué aprende el alumnado y cómo, más allá del contenido de la asignatura y del recurso que se esté empleando. Su enseñanza está centrada en las personas de las que tiene la responsabilidad de educar. En el triángulo contenidos (música)-recursos (fundamentalmente TIC)-educación (estudiantes), el vértice superior lo ocupa claramente su alumnado, a quien quiere hacer competente

con ayuda de los otros dos elementos. Su transición desde ser un instrumentista que quiere dedicarse a la música antigua a ser un profesor de música, por sentirse “muy presionado por su entorno”, en gran parte se debe a las TIC, lo que habría sido imposible sin los recursos adecuados (su cambio desde un aula prefabricada a otra con la dotación adecuada) y sin la preparación adecuada que ha tenido la oportunidad y el interés de recibir.

A partir de su experiencia docente, su uso de las TIC y su concepto de la educación musical es posible ver cómo este profesor se encuentra en un proceso continuo de estar “despierto” a una renovación reflexiva del currículo en el que estos tres elementos interaccionan entre sí y, a medida que los va articulando de diferente manera, le permite cambiar su identidad de ser músico a ser profesor de música. El camino no es fácil, pues a su primer énfasis en los contenidos le siguió una excesiva concentración (o así lo vive al menos este profesor) en el recurso tecnológico por el propio recurso, hasta encontrar el equilibrio que con posterioridad parece haber encontrado entre contenidos, recursos y necesidades de su alumnado, en un claro ejemplo de cómo lo personal, lo social y lo profesional interaccionan para conformar la identidad profesional (Beijaard, Meijer y Verloop, 2004).

En el caso del segundo profesor, las TIC no han supuesto una transformación tan radical de su enseñanza, sino una profundización y mejora en sus estrategias. Para Luis, también el alumnado tiene prioridad, aunque los contenidos parecen tener una importancia muy secundaria. Podría haber sido profesor de lengua, de matemáticas, de música, o de lo que sea; su interés está en la metodología de clase dirigida al pensamiento crítico y a la emancipación de sus estudiantes a partir de los principios de la democracia aplicada al aula. Hay un evidente contenido ideológico, como en cualquier aula, en tanto en cuanto toda interacción humana está mediada por discursos, con la diferencia aquí de que este profesor se asegura de explicitarlos. Esta ideología en este aula está explicitada en la defensa de los

valores de la democracia deliberativa, y las TIC juegan un papel muy importante para tal fin.

Su práctica docente se sustenta en un modelo de aprendizaje en red que busca el autoaprendizaje reflexivo por parte del alumnado, y en ese contexto se percibe a sí mismo como facilitador y orientador, pero no como habitualmente se entiende desde un enfoque constructivista, también con una perspectiva crítica en la que expresamente se busca la emancipación del alumnado. El compromiso social de este profesor por lo público, lo colectivo, lo común, se ve así reflejado en su modo de concebir la enseñanza, y en su idea final de crear una comunidad virtual, una red social más allá de las clases porque en éstas ha creado la base para ello.

Para este aprendizaje en red, las TIC resultan ser un elemento formidable en el que se emplean como herramienta, no como un fin en sí mismo. Estas actividades suelen resultar motivadoras para el alumnado pero, tal y como las emplea este docente, sobre todo permite que cada estudiante se desarrolle autónomamente interaccionando entre iguales, es decir, con otros y otras estudiantes. Las TIC se emplean así, de acuerdo a los principios de interacción de la sociología postestructuralista, es decir, promoviendo el aprendizaje mediante la apropiación de discursos y prácticas prominentes y específicos de cada contexto (Bourdieu, 1991), en este caso digital y virtual.

En suma, disponibilidad de recursos, capacitación del profesorado para usarlos a nivel de usuario y también pedagógico, son las claves que permiten a estos docentes que las TIC se constituyan en un medio para la innovación y mejora que, aplicando su impronta personal, les permite mejorar la calidad de su enseñanza, ya sea transformándola, como en el caso del primer profesor, o permitiendo profundizar en sus estrategias de enseñanza en el del segundo. En ambos casos, se trata de hacer al alumnado más competente en las capacidades del currículo sin importar la asignatura, y que hace más

visible y democrático al permitir someter la labor docente al escrutinio público.

Notas

¹ Los datos de este estudio de caso son parte de la tesis doctoral actualmente en curso *Uso de las TIC en el Aula de Música en Educación Secundaria*, a cargo de José Luis Guerrero Valiente, y dirigida por José Luis Aróstegui Plaza.

² Este estudio se ha realizado en el marco del Proyecto «La ciudadanía en los nuevos escenarios digitales y escolares: relaciones e implicaciones en el alumnado de Educación Secundaria Obligatoria (ESO)», Proyecto I+D+i financiado por el Ministerio de Ciencia e Innovación con el código EDU2010-18585.

³ Y de las que puede verse en <http://www.totemguard.com/aulatotem/2011/11/como-iniciarte-en-twitter-como-docente-en-5-minutos-2/>

⁴ Reproducimos los mensajes de *Twitter* tal como se subieron a la red, los cuales pueden tener hasta 140 caracteres, de ahí que muchas palabras aparezcan en numerosas ocasiones entrecortadas.

⁵ En <http://edutwitter.wikispaces.com> compendia numerosas experiencias de uso del *Twitter* en el aula, también de *Facebook*, en España.

Referencias

- Area, M. (2010). El proceso de integración y uso pedagógico de las TIC en los centros educativos. Un estudio de casos. *Revista de Educación*, 352, 77-97.
- Aróstegui, J.L. (2011). Retos políticos, ciudadanos y educativos del uso de internet en la escuela. *REIFOP*, 14(2), 35-48. Retrieved from [here](#).
- Beijaard, D., Meijer, P. & Verloop, N. (2004). Reconsidering research on teachers' professional identity. *Teaching and Teacher Education*, 20(2), 107-128. DOI: 10.1016/j.tate.2003.07.001
- Bourdieu, P. (1991). *El sentido práctico*. Madrid: Taurus.
- Buckingham, D. (2005). *Educación en medios. Alfabetización, aprendizaje y cultura contemporánea*. Barcelona: Paidós.

- Cabero, J. (2005). Estrategias para la formación del profesorado en TIC. Retrieved from [here](#).
- Law, N. & Chow, A. (2008). Teachers characteristics, contextual factors, and how these affect the pedagogical use of ICT. In N. Law, W. Pelgrum & T. Plomp (ed.). *Pedagogy and ICT use in schools around the world. Findings from the IEA SITES 2006 Study*. Nueva York: Springer.
- Murillo, J. L. (2010). Programas Escuela 2.0 y Pizarra Digital: un paradigma de mercantilización del sistema educativo a través de las TICs. *Revista Interuniversitaria de Formación del Profesorado*, 13(2), 65–78.
- Oblinger, D., Oblinger, J.L. & Lippincott (2005). *Educating the Net Generation*. Boulder: EDUCAUSE. Retrieved from [here](#).
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1-6. Retrieved from [here](#).
- Quintero, A. y Hernández, A. (2005). El profesor ante el reto de integrar las TIC en los procesos de enseñanza. *Enseñanza*, 23, 305-321.
- Savage, J. (2007). Reconstructing music education through ICT. *Research in Education*, 78, 65-77. DOI: [10.7227/RIE.78.6](#)
- Stake, R.E. (2013). *Multiple case study analysis*. Nueva York: Guilford Press.
- White, D.S. y Le Cornu, A. (2011). Visitors and Residents: A new typology for online engagement. *First Monday*, 16(9). DOI: [10.5210%2Ffm.v16i9.3171](#)

José Luis Aróstegui is Professor at the Music Education Department, University of Granada, Spain.

José Luis Guerrero is Ph.D candidate in Music Education, University of Granada, Spain.

Contract Address: Direct correspondence to the authors at Facultad de Ciencias de la Educación. Campus de Cartuja, s/n, 18071 Granada (Spain). E-mail address: arostegu@ugr.es; guerrero@ugr.es. Twitter: [@JL_Arostegui](https://twitter.com/JL_Arostegui); [@joluguerrero](https://twitter.com/joluguerrero).

Review

Gompertz, W. (2013). *¿Qué estás mirando? 150 años de Arte Moderno*. Madrid, Taurus. 496 pp. ISBN: 978-84-306-0125-7 [Monografía] ISBN: 978-84-306-0309-1 [Archivo de Internet]

No es frecuente que un libro que trata de arte, y más aún de arte moderno, en su edición en castellano tenga varias ediciones seguidas, tras haberse agotado las anteriores. Esto lo entendemos en el caso de algunas novelas que se convierten en *best sellers*, pero llama la atención que un voluminoso libro tenga la favorable acogida que ha recibido el que comentamos, sabiendo que el público que lo adquiere debe tener una cierta formación en la temática tratada.

Para comprender lo anterior habría que comenzar dando algunos datos de su autor. De entrada, hay que apuntar que Will Gompertz es periodista especializado en los temas de arte. En función de ello, se entiende que sea director de Arte de la BBC y que durante siete años trabajara en la Tate Gallery londinense. Como periodista, ha escrito en los diarios *The Times* y *The Guardian* a lo largo de dos décadas. El haberse especializado en los temas artísticos le proporcionó el acceso a creadores contemporáneos como son Damien Hirst, Ai Weiwei o David Hockney, a los pudo entrevistar detenidamente.

Pero lo más singular de este trabajo es el enfoque narrativo planteado por Gompertz, alejándose de los esquemas de los libros que tratan el arte, pues lo más habitual es plantear la obra basándose en el análisis y la biografía de los autores tratados, así como en el estudio cronológico de las distintas corrientes que han existido.

En este caso, el autor aborda el siglo y medio de arte contemporáneo con la perspectiva de un relato, alejándose de los fríos planteamientos textuales utilizados por los expertos que publican acerca del mundo artístico, donde se busca, por encima de todo, que los datos biográficos o históricos sean precisos y sin ningún tipo de dudas, al tiempo que los juicios estéticos se expresan mediante un lenguaje

en ocasiones muy críptico, cuando no cargado de una retórica ampulosa, en la que se manifiesta una oculta intención de que el escritor o el crítico adquiriera un destacado protagonismo en aquello que cuenta.

Puesto que Gompertz, como decimos, se acerca a la estructura narrativa del relato, busca un punto de arranque del mismo y lo ubica en el año 1917, tomando como elemento de referencia la obra *La fuente* de Marcel Duchamp. Pero veamos como comienza el primer capítulo:

“El lunes 2 de abril de 1917, en Washington, el presidente estadounidense Woodrow Wilson apremia al Congreso a proclamar formalmente una declaración de guerra contra Alemania. Mientras tanto, en Nueva York, tres hombres jóvenes, bastante bien vestidos, salen de un espléndido dúplex en el número 33 de la West 67th Street y dan una vuelta por la ciudad. Hablan, caminan y sonríen, de vez en cuando se ríen, aunque sin hacer aspavientos. Al francés delgado y elegante que va en medio, flanqueado por sus dos amigos estadounidenses bajos y fornidos, le encantan esos paseos. Es un artista que aún no lleva dos años en la ciudad: bastante tiempo para hacerse una buena idea, pero demasiado poco para mostrar displicencia ante sus encantos excitantes y sensuales. La sensación que le genera el recorrido hacia el sur de la ciudad, a través de Central Park y hacia Columbus Circle, siempre le levanta el ánimo...”.

Como podemos apreciar, este podría ser el inicio de una novela, en la que el autor pretende ganarse pronto al lector para que no desista en el largo camino que comienza con la lectura. ¿Y quién era el artista al que alude Will Gompertz? Pues Marcel Duchamp, el provocador y rupturista creador para el que un urinario masculino en posición invertida y firmado como “R. Mutt 1917” lo presenta como una obra de arte, ya que así lo quiere el propio autor.

De este modo se inicia un viaje divertido, riguroso y ameno del arte moderno, atravesando las distintas corrientes y sus autores más relevantes, comentados a través de obras significativas, hasta llegar a los nombres más recientes de nuestro siglo veintiuno, en el que la mirada del espectador se ha modificado, en gran medida, a causa del denominado arte moderno.

List of Reviewers

Thank you to 2013 reviewers. On behalf of the Multidisciplinary Journal of Educational Research we deeply appreciate reviewers contributions to the quality of this journal. The journal owes this debt with those who have been peer reviewers during this period. Yours sincerely,

Blas Segovia
Òscar Prieto-Flores
Editors

Ajahi, Kejinde
Álvarez, Carmen
Barba, José J.
Barbosa, M Ligia de
Oliveira
Belén, Ana
Díez, Javier
Esteve, Olga
García-Pérez, Daniel
García, Alfonso
Gutiérrez, Alfonso
Íñiguez, Tatiana
Larena, Rosa
López-Cobo, Isabel
Macías, Fernando
Martín, Noemí
McLaughlin. Thomas
Molina, Sílvia

Prados, Mar
Peña, Juan Carlos
Rodríguez, Henar
Rodríguez, Francesc
Sánchez Santamaría, José
Santa Cruz, Iñaki
Sidera, Francesc
Siles, Gregor
Soler, Marta
Valls, Rosa