

# **A Scale to Measure Student's Motivation, Learning Resources and Styles**

## **Rui Moreira**

Higher School of Education | Polytechnic Institute of Viseu, Portugal

E-mail: rjfmoreira@gmail.com

## **Cláudia Seabra**

Higher School of Technology and Management | Polytechnic Institute of Viseu, Portugal

E-mail: cseabra@estv.ipv.pt

## **José Luís Abrantes**

Higher School of Technology and Management | Polytechnic Institute of Viseu, Portugal

E-mail: jlbrantes@estv.ipv.pt

## **Belmiro Rego**

Higher School of Education | Polytechnic Institute of Viseu, Portugal

E-mail: brego@esev.ipv.pt

## **ABSTRACT**

The world has changed and our students too! They are now more demanding and know what they want and like. Teachers must be alert and keep interaction to motivate them daily. Since very young people learn to live with the Information and Communication Technologies (ICT). The use of technology in our day to day lives is unavoidable. Information, games and other tools placed at the service of education made this new virtual environment the preferred context to learn. Thus becomes important to consider the role of ICT in society and at school, including its impact on the teaching-learning process transformation. The use of ICT should be done in an integrated and inclusive way, teach how to use, consume and interact with technology so critical. The study presented here intends to contribute to a more depth study of the impact of ICT in the teaching-learning process, specifically in the History subject to lower education students. The main objective is to create a scale to measure the Interest and Motivation to the Subject, Motivation and Involvement with Learning Resources and Learning Styles. Insights from an empirical study of 357 lower education students indicate that this multi-dimensional scale incorporates the following constructs: a) Interest and Motivation with History Subject, b) Motivation and Involvement with ICT's Learning Resources, c) Motivation and Involvement with Teachers' Learning Resources and d) Non Literary Learning Styles. Discussion centers on the implications of this scale for theory development and management decisions. Teachers and schools managers may better understand the learning resources and styles preferred by students and create more motivational learning programs. Directions for future research are also presented.

## **Keywords**

Pedagogy; Student behavior; Learning Resources; Learning Styles.

**Conference Topic:** Social sciences and business

Acknowledgments: Portuguese Foundation for Science and Technology and Center for Studies in Education, Technologies and Health.

## **1. INTRODUCTION**

The world has changed and our students too! They are now more demanding and know what they want and what they like but. Teachers must be alert and keep interaction to motivate daily. Since very young learn to live with the Information and Communication Technologies (ICT). It thus becomes important to consider the role of ICT in society and at school, including its impact on the teaching-learning process changing. ICT can contribute to change the current paradigm of teaching and learning and of the school itself as a social space. The school must become an intercultural place where student abandons his passive position to be an active agent in his own learning where the teacher leaves his isolated position of single agent in the learning process to also turn himself into student's pupil and collaborator of the teaching process. This requires the use of ICT in an integrated and inclusive way, to teach how to use, consume and interact with technology in a critical way, "stimulating critical technologies and their products" (Pretto 2000 in Bridges, 1999 p.88).

This study aims to understand how the education, learning and motivation for students change with the use of ICT and multimedia resources in the classroom while motivational factors and success in the teaching-learning process.

## **2. LITERATURE REVIEW**

The growing importance of ICT in schools has provoked several debates and discussions on its effectiveness in the rhythms of student learning, in the roles of the teachers and students and even in the role of the school as an institution. Proponents of universalized use of ICT in schools proclaim that this use allows developing new capabilities in students' learning, to extend their horizons to a diverse and global scale (McGrath, 1997-1998). On the other side of the continuum, those who criticize ICT use argue that it limits and constrains student learning transforming students in passive receivers of information, socially isolated (Abrahamson, 1998).

In this study, we adopted a cautious position on the perspective in which the use of ICT itself may not be sufficient to explain and characterize the new student. Other factors may be behind the students' performance, factors that will influence the way they perceive the school and therefore the use of ICT, such as the student's social context, personal factors and learning styles and resources learning.

### **2.1. Students' Social Context**

The need to engage students and make them active and interested participants in the classroom has been recognized by many researchers (Hay et al., 2004; Lowman & Mathie, 1993; Webster & Hackley, 1997). In fact, the interaction has been identified as a key factor in the learning experience (Vygotsky, 1978). In the current pedagogical relationship some components considered essential are involved: the student, his personality, the family and social context, the teacher, his personality, the social environment, specifically the family and society as a whole (Mialaret, 1992).

The student's performance depends on many factors that are not limited to their cognitive and/or learning performance capabilities. The environment and social and educational context in which the learning process takes place, is also essential (Young, 2005). Most elements of the school community considers school a more enjoyable and useful place when they believe that others appreciate and value them in their environment (Goodenow & Grady, 1993), being this also a motivating factor for learning (Weiner, 1990). Creating a productive learning

environment requires a climate in which students feel good about themselves, peers, teachers and social environment as a whole.

We considered the relationship of the student to the school environment in the following areas: i) student/ teacher; ii) student/student, iii) School/family, supported by research on cooperative learning and reciprocal teaching (eg. Johnson & Johnson, 1991; Palincsar & Brown, 1984, Slavin, 1990), the study of social interaction as a primary source of cognitive development (Rogoff, 1990, Vygotsky 1978), in research on the effects of friendship, school adjustment (Berndt & Keefe, 1992) and the study of the influence of social context variables in cognitive, motivational, and educational processes (Goodenow, 1992; Weiner 1990).

## **2.2. Personal Factors and Learning Styles**

When a student is interested and motivated, his learning is more effective and the teacher's role is facilitated (Abrantes et al., 2007; Young et al., 2003). Students reject learning environments that don't like and, moreover, their perception of learning is worse in those environments (Hsu, 1999). In this context, student's intrinsic factors, the environment and learning styles are important issues to examine how students focus on the contents (Young et al., 2003; Hamer, 2000; Clarke III et al., 2001). The theory of learning styles points to individual preference -related factors, such as: environment, emotions, interactions and physical needs that have an impact on the learning process (Dunn & Griggs, 1995). On the other hand, students with similar preferences in terms of learning styles have similar choices in terms of subjects and courses of study and prefer teachers with teaching methods tailored to their learning styles (Kolb, 1988). Other researchers have shown that there is a correlation between learning styles with preferences for work (Lashinger & Boss, 1984), educational involvement, motivation and learning (Honey & Mumford, 1992) and student performance (Brokaw & Mertz, 2000).

In this context, it is important to analyze the contexts that the student values and his perspective on facilitating the learning. We considered this aspect: i) motivation and student interest, ii) student behavior iii) and learning styles.

## **2.3. Learning Resources**

When preparing lessons, teachers have at their disposal several techniques for the teaching process, on the other hand, with technological advances, the decision is increasingly complex. In addition, many teachers carefully weigh the potential effect of new teaching techniques introduction in their evaluation by students (Clarke III et al., 2001).

Several educational resources and methods have been investigated in the literature such as exercises in class, lecture method, use of case studies (Davis et al., 2000), combination of written and electronic means (McNeilly & Ranney, 1998), collection and projects research group, teamwork (Bridges, 1999; McCorkle et al., 1999) and the effect of the activities in the classroom on student learning (Hamer, 2000). More research suggests that a favorable attitude of the students against the style of teaching leads to better outcomes and that the correlation between the methods of teaching and learning styles results in more learning (Dunn et al., 1990).

The use of technological resources and ICT in classrooms is common and recurring today. Potentially, students may withdraw several advantages of the use of those technologies, first for their own development of skills in using ICT, new forms of mediated learning help students to receive the information and this form of learning gives the student more autonomy

and more freedom, increasing his performance (Alevén & Koedinger, 2002; Hunt et al., 2004).

However, the use of ICT in teaching learning raised several questions about the best combination of educational resources. The perspective that the use of ICT in the classroom is beneficial and effective for teaching and learning, does not invalidate the importance of using other teaching resources that do not include ICT (Berry, 1993). Both teaching resources - with and without use of ICT - are important to students, should not be exclusionary and can live side by side in a complementary manner in the teaching/learning process (Hamer, 2000).

We considered the learning resources as including i) the use of learning resources and ii) the use of technology.

Regarding the use of teaching resources there is great unanimity among researchers as to the need for replacement of passive methods for models of experiential and interactive learning (Davis et al., 2000; McNeilly & Ranney, 1998; Hamer, 2000).

### **3. METHODOLOGY**

This study was developed based on a survey to students in 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> year of school in Portuguese schools. The questionnaire was developed based on previous scales (Abrantes et al., 2007; Hunt et al., 2004).

An online questionnaire was proposed to the students of 7th, 8th and 9th grade between February and April of 2013. 255 questionnaires were validated from 257 questionnaires received.

Regarding the socio-demographic profile, the sample consists mainly of females (53.5%). The most represented age groups are 13 and 14 years (30% and 29.7% respectively). Most students in the sample never failed (69.7%). 21.3% failed once, twice 7.3% failed and only 8% failed three or four times. When asked about the daily study time beyond school hours, half of the students said they spent about one to two hours daily, 34% studied less than an hour per day. Regarding the household was asked students what were the occupations of father and mother. In most respondents father were factory or agriculture workers (51.3%) or commercial/administrative (11.2%), the mothers were mainly domestics (25.2%), where factory or agriculture workers (24.9%) and business administration employees (19%).

### **4. EMPIRICAL COMPONENT**

In order to assess the validity of the measures, the items were subjected to a confirmatory factor analysis (CFA), using full-information maximum likelihood (FIML) estimation procedures in LISREL 8.8 (Jöreskog & Sörbom, 1996). In this model, each item is restricted to load on its pre-specified factor, with the three first-order factors allowed to correlate freely. After CFA purification, a list of 18 items was found. A full listing of the 18 final items after CFA purification and their scale reliabilities is shown in Table 1.

The chi-square for this model is significant ( $\chi^2=249,95$ , 129 df,  $p<.00$ ). Since the chi-square statistic is sensitive to sample size, we also assessed additional fit indices: Normed Fit Index (NFI), Comparative Fit Index (CFI), the Incremental Fit Index (IFI), and the Tucker-Lewis Fit Index (TLI). The NFI, CFI, IFI and TLI of this model are .97, .99, .99, and .98, respectively.

As can be seen in Table 1, convergent validity is evidenced by the large and significant standardized loadings of each item on its intended construct (average loading size is 0.786 and 16.90). Also all constructs present desirable levels of composite reliability (Bagozzi,

1980). Discriminant validity among the constructs was stringently assessed using the Fornell and Larcker (1981) test; all possible pairs of constructs passed this test (Table 1); more specifically, the average variance extracted was above the recommended level of 0.50 for all three constructs. Evidence of discriminant validity was also revealed by the fact that all the constructs' inter-correlations were significantly different from 1 and the shared variance between any two constructs (i.e. the square of their inter-correlations) was less than the average variance extracted for each construct.

Hence, none of the correlations in the final model was sufficiently high to jeopardize the constructs' discriminant validity (Anderson & Gerbing, 1988).

**Table 1 – The IRLSHistory-Scale - Constructs, scale items, reliabilities and T-Values**

## **5. DISCUSSION**

The aim of this study was to measure and analyze the importance felt by students on ICT in the History subject learning. Other factors were analyzed to understand their impact on the learning success of that subject, including family involvement with the school, student interest, styles and learning resources. The frequency analysis of responses allowed us to draw some conclusions:

- There is great parent involvement of the parents with the school, as well as an active participation in school and extracurricular activities.
- Parents have an absolute knowledge of children's situation in school.
- Students reported that their main motivations to school were linked with the satisfaction in improving their knowledge and personal skills, interest in learning interesting things and self-actualization.
- However, the expectations to complete the studies are low for most students.
- Students found the History subject interesting in terms of content and intellectual challenge, showing great willingness to acquire competence in this area.
- Students recognize that there are different learning styles causing different stimuli for the acquisition of knowledge.
- When comparing learning resources, students prefer the use of ICT in relation to reading and listening contents.
- Students value the role of the teacher: what he says, advises or encourages to do.
- Most of the students stated that like to work with ICT, stating that they feel very comfortable in using those resources demonstrating familiarity, proximity and frequent use of ICT.
- In what regards to learning resources, a large proportion of students reported reduced use of ICT in schools, including email, chat, teacher's personal page, research in the online library, video and audio conferencing.
- The resources that students identified as the most used were textbooks, homework, tests/exams and assignments in class. Thus continues to dominate the use of non ICT resources.

We also concluded that students give importance to the teacher's role, namely in what regards to trust, confidence in knowledge, willingness to help regardless the learning resource used to transmit knowledge. Thus, it appears that the empathy created between elements in the teaching-learning process is crucial to the educational success.

It was also possible to build a scale to measure the Interest, Resources and Learning Styles for the History subject – the IRLSHistory-Scale. The scale consists in four dimensions:

- Interest and Motivation for the discipline of history,
- Motivation and engagement with ICT learning resources
- Resources for Learning made by Teachers
- Nonliterary Learning Styles

## CONCLUSIONS

The tool developed in this study can be used to measure the interest and motivation of the students, the teaching resource valued by students and learning styles preferred by them in the History subject. The existence of these four dimensions allows us to conclude that students consider at the same level the importance of i) Interest and Motivation for the History subject, ii) Motivation and Engagement with ICT Learning Resources, iii) Resources for Learning made by Teachers, iii) and Non-Literary Learning Styles.

The present study may serve to show the Education Ministry the students' profile that are currently in the 3rd cycle of basic education, also the resources and learning styles that are used in our schools. So, we can realize who these students are, in order to motivate them to learning, in this case in the History subject, but that can be extended to other knowledge areas.

The scale presented serves to know and analyze the interest, learning resources and styles valued and preferred by students. We were also able to measure the use of ICT and multimedia in teaching verifying the investment made by the Ministry in the schools regarding computers knowing if they are used frequently by students and teachers. We can conclude that the state should not only investment on equipment but also in training to teachers so they can use the equipment properly and diversify strategies meeting increasingly the "technological" students.

Also, the purpose of this model is to contribute to a better understanding of the learning resources and styles used by teachers in the History classes. The study may help teachers to select the best and more effective methodologies and learning resources and styles to motivate students and achieve a greater educational success.

From the research point of view it is also expected to make a relevant contribution to science in the study of ICT and multimedia resources impact in education nowadays, given that the school cannot be separated from technology.

The work presented may thus contribute to the development of literature in education in the various social sciences through the following implications: better understanding of the students' interests, the best measurement capability of learning styles and resources, for the development of scales and better understanding of learning styles and resources impact in the learning process, improving the skills and providing more performance and success of students.

## REFERENCES

- Abrantes, J., Seabra, C., & Lages, L. (2007). Major determinants of students' perceived learning: Pedagogical affect, student interest and learning performance. *Journal of Business Research*, 60(9), 960-964.
- Anderson, J., & Gerbing, D. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411-423.
- Bagozzi, R. (1980). *Causal models in marketing*. New York: John Wiley.
- Berndt, T., & Keefe, K. (1992). Friends' influence on adolescents' perceptions of themselves at school. In D. H. Meece (Ed.), *Student Perceptions in the Classroom* (pp. 51-73). Hillsdale, New Jersey: LEA.
- Berry, L. (1993). Our roles as educator: Present and future. *Journal of Marketing Education*, 15, 3-8.
- Bridges, E. (1999). Experiential learning and customer needs in the undergraduate marketing research course. *Journal of Marketing Education*, 21(1), 51-59.
- Brokaw, A., & Merz, T. E. (2000). The effects of student behavior and preferred learning style performance. *Journal of Business Education*, 44-53.
- Clarke III, I., Flaherty, T. B., & Mottner, S. (2001). Student perceptions of educational technology tools. *Journal of Marketing Education*, 23(3), 169-177.
- Davis, R., Misra, S., & Van Auken, S. (2000). Relating pedagogical preference of marketing seniors and alumni to attitude towards the major. *Journal of Marketing Education*, 22, 147-154.
- Dunn, R., & Griggs, S. (1995). *Multiculturalism and learning style: Teaching and clousing adolescents*. Westport: Praeger.
- Dunn, R., Giannitti, M., Murray, J., & Rossi, I. (1990). Grouping students for instruction: Effects of learning style on achievement and attitudes. *Journal of Social Psychology*, 130, 485-494.
- Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(February), 39-50.
- Goodenow, C. (1992). Strengthening the links between educational psychology and the study of social contexts. *Educational Psychologist*, 27, 177-196.
- Goodenow, C., & and Grady, K. E. (1993). The relationship of school belonging and friends' values to academic motivation among urban adolescent students. *Journal of Experimental Education*, 62(1), 60-71.
- Hamer, L. (2000). The additive effects of semistructured classroom activities on student learning: An application of classroom-based experiential learning techniques. *Journal of Marketing Education*, 22(1), 25-34.

- Hay, A., Hodgkinson, M., Peltier, J., & Drago, W. (2004). Interaction and virtual learning. *Strategic Change*, 13(4), 193-204.
- Honey, P., & Mumford, A. (1992). *The manual of learning styles*. Berkshire, UK: Maidenhead.
- Hsu, C. (1999). Learning styles of hospitality students: Nature or nurture. *Hospitality Management*, 18(3), 17-30.
- Hunt, L., Eagle, L., & Kitchen, P. (2004). Balancing marketing education and information technology: Matching needs or needing a better match? *Journal of Marketing Education*, 26(1), 75-88.
- Johnson, D., & Johnson, R. (1991). *Learning together and alone*. Englewood Cliffs, N.J.: Prentice-Hall.
- Jöreskog, K., & Sorbom, D. (1996). *LISREL 8: User's reference guide*. Chicago: Scientific Software International.
- Kolb, D. (1988). Learning styles and disciplinary differences. *California Management Review*, 18(3), 22-31.
- Lashinger, H. K., & Boss, M. W. (1984). Learning styles and nursing students and career choices. *Journal of Advanced Nursing*, 9, 375-380.
- Lowman, J., & Mathie, V. (1993). What should graduate teaching assistants know about teaching? *Teaching of Psychology*, 29(2), 84-88.
- McCorkle, D., Reardon, J., Alexander, J. F., King, N. D., Harris, R., Iyer, R., et al. (1999). Understanding marketing students, group projects and teamwork: The good, the bad and the ugly? *Journal of Marketing Education*, 21(2), 106-117.
- McNeilly, K., & Ranney, F. (1998). Combining writing and electronic media in sales management courses. *Journal of Marketing Education*, 20 (fall), 226-235.
- Mialaret, G. (1992). *Psicopedagogia*. Lisboa: Dom Quixote.
- Palincsar, A., & Brown, A. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction*, 1, 117-175.
- Peltier, J. W., Drago, W., & Schibrowsky, J. A. (2003). Virtual communities and the assessment of online marketing education. *Journal of Marketing Education*, 25, 260-276.
- Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. New York, NY: Oxford University Press.
- Slavin, R. (1990). *Cooperative learning: Theory, research and practice*. Englewood Cliffs, N.J.: Prentice-Hall.
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Edits.) Cambridge, MA: Harvard University.
- Webster, J., & Hackley, P. (1997). Teaching effectiveness in technology-mediated distance learning. *Academy of Management Journal*, 40(6), 128.
- Weiner, J. (1990). Asymmetric competition in plant populations. *Trends in Ecology and Evolution*, 5, 360-364.
- Young, M. (2005). The motivational effects of the classroom environment in facilitating self-regulated learning. *Journal of Marketing Education*, 27(1), 25-40.
- Young, M., Klemz, B., & Murphy, J. (2003). Enhancing learning outcomes: The effects of instructional technology, learning styles, instructional methods, and student behaviour. *Journal of Marketing Education*, 25(2), 130-142.