

## **ANALYSIS AND UNDERSTANDING PRACTICES AND USES OF A VLE IN SECONDARY EDUCATION: TOWARD A NEW MODEL OF THE USES**

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### **Abstract**

In France, the Region of Lorraine is currently implementing a Virtual Learning Environment in his secondary school. But the arrival of such tool changes existing practices. So we are led to understand: what drives people to use it or not and how is it used. We make the following hypothesis that using a VLE in the daily practices is linked to a set of variables which are considered as predominant by users. Based on individual perceptions, ergonomic and social considerations, we plan to create our own acceptability model of a VLE, to explain and predict its uses in a specific context: the secondary educational community.

KEY WORDS: *VLE, acceptability, TAM, perception, useful, usability, subjective norms, attitude, secondary school.*

### **Introduction**

Information and communication technology (ICT) are more and more present in dally live of developed society. Widely used in work context, manly to improve productivity and communication, it's not a surprise to see them appear in the education system. Looking for innovation and improving quality of their education, schools are trying to integrate modern tools so as software and platform of e-learning. They notably do the postulate that support digital culture can promote students access to employment. However, integrate new technologies into the educational system request to rethink the manner of working notably by teachers. Consequently, many questions in terms of uses and communication processes emerge when a digital device in educational context is implanted (Paquelin, 2009).

Nowadays more and more education communities would adopt a web platform to guide their students. So, many teaching institutions decide to deploy a Virtual Learning Environment (VLE). Previous works of Martins & Kellermann (2004) and Ngai, Poon, & Chan (2007) Van Raaij & Schepers (2008, p. 839) define this tool as "*a web-based communications platform, that allows students, without limitation of time and place, to access different learning tools, such as program information, course content, teacher assistance, discussion boards, document sharing systems, and learning resources*".

### **VLE: French specificities**

In France, we use the term of "ENT" for "*Environnement Numérique de Travail*". But its signification is sensibly different from the English vocabulary. The platform is used both to teach and to administrate. It's a "toolbox" with a wide range of services. French government defines officially an ENT as "*a global system providing a unified access point, through the networks, to all the tools, contents and application services related with its activity. It's a unique entry point to access to the information system of school administration or school*" (SDET, 2011). Therefore, in France, ENT is more a digital work environment than a VLE. However, because our study considers an educational context, we will use the term of VLE to designate the ENT.

The VLE deployment in secondary schools has become a priority for the French ministry of education, as shown by the circular of 16 March 2010 (MEN, 2010) and the construction of a master plan for its deployment (SDET,

2011). Many circulars and reports highlight the need to modernize the education system and to develop students' digital competencies to enforce their employability (Attali, 2008).

## Context of the study

To support the deployment of this technology, institutions looked for a methodology to observe and to analyse practices in the education community. So, since September 2009, a PhD thesis was co-funded by the Regional Council of Lorraine, Meurthe & Moselle County, *Caisse des Dépôts* group, two private companies, Itop and Atos Origin.

This work takes into account the progress of VLE deployment and the confrontation between effective uses to expected uses. We aim to propose a model which describes and explain current uses of the computer system. Our hypothesis is as follows: VLE acceptability in the daily practices is linked to a set of variables considered predominant by users. To understand the process of the tool appropriation, our study focuses on ergonomic and social context considerations and more particularly on the individual perceptions.

Our research is based on the Nancy-Metz Academy. According to a timetable over three academic years, they actually deploy a Learning Management System (LMS) in secondary school, first and second level. This system is called PLACE for *Plateforme Lorraine d'Accessibilité et de Communication pour l'Education*. It includes some functionalities distributed in modules such as emails, information board, personal storage space, collaborative tools, School books, a library space, planner, resources reservation module. For the Lorraine Region, it will be a tool to serve the citizen with two objectives: on one hand, facilitate the access to resources and services for every member of the educational school community, on the other hand, improve the access conditions to a digital culture. Since September 2009, the platform has been applied in more than a hundred schools in Lorraine. Ultimately, it will concern more than 300,000 people.

To understand uses of a VLE, we have do primary research about first uses of his school books (Cherqui-Houot, Trestini & Schneeweile, 2010) and the social representation of PLACE. But elaborate a model to explain VLE uses in secondary school will be not so easy. Firstly, population is composed by many users' profiles i.e., parents, teachers, students, and administrative staff. Obviously, objectives of each one can be radically different according to their status. Secondly, we must consider that people who work in a school establishment are not only employee; they are mainly civil servants so they benefit a stability of employment. Thirdly, parents come from different socio-professional categories. Consequently there is a large variety of experiences in computer use.

There exist many models describing the cognitive process for new technology acceptance. Many variables can influence the decision to use a technology. So we search to elaborate an appropriate model in accordance to our problem notably the specificity of the educative community. Here, we consider that TAM is a good starting point but it neglects the importance of two factors that we think that they are crucial in a school context: social pressure (Schepers & Wetzels, 2007) and the place occupied by the technology in work habits (Triandis, 1979).

## Acceptability: a definition

Acceptability can be defined as a positive or negative feeling which determines the decision to use a technology. We refer on the theoretical framework coming from a well-known model developed by Davis (1989) called the Technology Acceptance Model i.e., TAM. It was based on the theory of reasoned action (TRA) from Fishbein and Ajzen (1975), which considers that beliefs determine attitudes and, consequently, user's behavior. This is related to the following question: is the use of VLE in a school "*consistent with the value, culture, organization in which you want to insert*" (Tricot, Plégat-Soutjis, Camps, Amiel, Lutz & Morcillo, 2003, p391)?

## Technology Acceptance Model

### What is it ?

TAM is a concept belonging to social psychology. It aims to provide the use of a tool probability based on two evaluation criteria: perceptions of usefulness and perception of usability. But for more clarity, in our model we were use the French terminology employed by Tricot (2003): usability and utility. Davis (1989) defines the usefulness as "*the degree to which a person believes that using a particular system would enhance his or her performance at work*" and the ease of use as "*the degree to which a person believes that using a particular system would be free of effort*" (Davis, 1989, P320). The model structure is shown in figure 1.

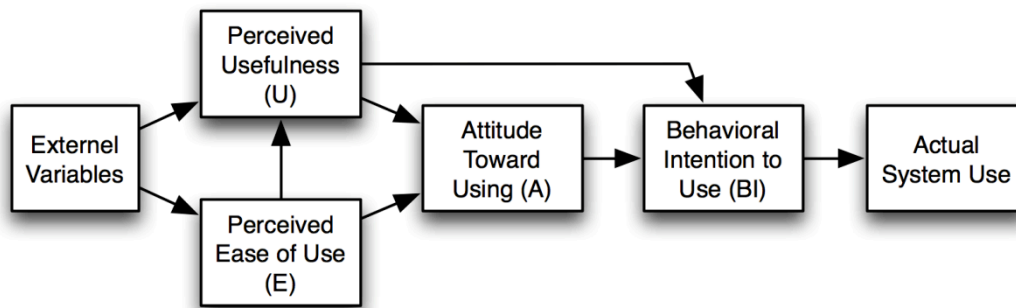


Figure 1 : The Technology Acceptance Model (Davis, Ragozzi & Warshaw 1989 p.985)

### **Why ?**

TAM is the appropriate approach to study technology acceptance. Based on an ergonomic approach, it has been used in many real cases (Sun and Zhang, 2006). Used in different cultural environments, especially American and European (Straub, Keil & Brenner, 1997), it has been applied to web portals, eLearning platforms whose characteristics are similar to VLE's ones (Ngai, Poon, & Chan, 2007; Van Raaij & Schepers, 2008; Sánchez & Hueros, 2010). User-friendly, TAM is particularly well suited to our study specially because its robustness and parsimony which have been highlighted in several studies (Subramanian, 1994, Venkatesh & Davis, 2000; Sun & Zhang, 2006). Moreover, TAM can permit to identify changes to make more acceptable and more attractive systems.

### **Its limitations**

Although, TAM can help to predict user's behavior this model leaves out contextual factor (McFarland & Hamilton, 2006). Therefore, the authors have tried to improve their model by a second version of TAM (Venkatesh, Morris, Davis & Davis, 2003), but the new version has no real success in the literature, mainly because it becomes too complex to apply.

### **The model**

Our model considers, in a first part, like the TAM the influence of usability and usefulness in the decision of using a new technology so as a VLE. But this consideration is not sufficient to explain behaviors. We consider, in a second part, that the uses are directly impacted by two contextual factors that we call: social and instrumental pressure (Figure 2).

#### **Social pressure**

Social pressure refers to the person entourage, their social network. People around us have an opinion on using a VLE, then, they are likely to influence our behavior of use and our acceptance of this tool. This concept is similar to the notion of subjective norm developed by Fishbein and Ajzen (1975, p. 302). A concept that they define as "the person's perception that most people who are important to him or her think he should or should not perform the behavior in question". The authors highlight the impact of social factors on the behavior intention. For Jan & Contreras (2011, p.487), it's the perception that individuals in the social system have about the person who is going to adopt a technology. So a norm can be characterized as subjective and contextualized (Zapata, 2009).

A meta-analysis conduct by Schepers & Wetzels (2007) show a significant influence of subjective norm to the behavior intention to use and therefore actual system uses. Hsu & Lu (2004) studies the use of online games, they find that social influence impact directly on uses. Consequently, in our research we consider that social pressure impact on the VLE uses. On the other hand, based on the studies of Malhotra & Galletta (2002), Jan and Conteras (2011), they observe that this factor can impact significantly on the attitude towards using software. Although all these studies are not conducted of secondary school students, and although a digital native effect can appear (Prensky, 2001), we suppose that we should obtain the same conclusions in our model.

#### **Instrumental pressure**

In our study we define instrumental pressure as the incorporation of a tool in educational community daily activities so as to become essential even mandatory. We consider that for the success of their educational

activities, users would feel a need, almost irresistible, to use the VLE. Our concept is close to the notion of behavioral habits, as outlined in the model of Triandis (1979), but we add the notion of dependence to the object. In his model habits influence affect towards the tool and therefore the behaviors intentions. So we can consider that instrumental pressure influence the VLE acceptability.

To our knowledge, the concept of instrumental pressure doesn't exist as we understand it in this study according to the TAM his variables. However a lot of researches observe a connection between the pressure of habits, in the sense used by Triandis (1979), and the behavior intention to use a new technology (Thompson, Higgins & Howel, 1994; Paré & Elam, 1995; Gagnon, 2003). Instrumental pressure is or characterized by the presence of prior experiences, a factor that has been the subject of many studies. For example, Koohang (2004), who study the students' online library uses, found that those with a high level of experience on the Internet uses have a perception of using online library more positive compared to those who have little experience. Similar results were observed by Akremi, Ben Naoui & Gaha (2004) in a population of employees. They highlight a positive impact of informatics skills in their attitude towards the use of an e-online training. Furthermore, Woods, Baker & Hopper (2004), observe that the main factor to explain the uses of a blackboard in faculty is prior experience. Consequently, in our model we admit that instrumental pressure influence directly acceptability and indirectly VLE uses.

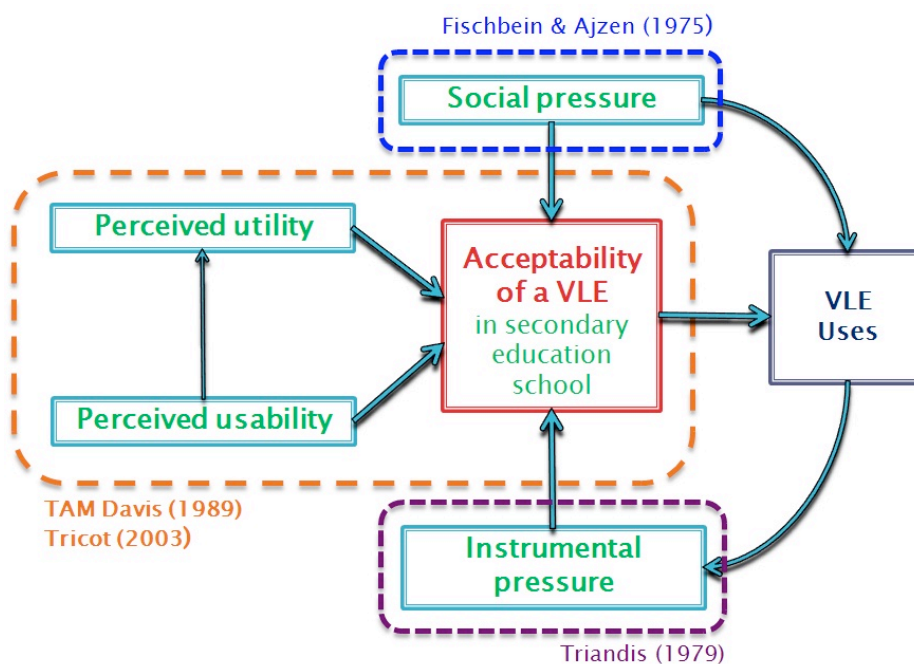


Figure 2 : Model developed to observe educational uses of a VLE

### Application of the model

After doing specific Likert scales for each dimension, the model was applied by an e-questionnaire specifically adapted for teachers, students, parents and administration staff. During March to April every person who logs on to the platform were asked to participate on the survey. We have obtained 4,635 answers but the results are actually being treated. More detailed results will be described in a forthcoming study.

### Conclusion

Integrate LMS at school include to modify daily practices of the educational community. In addition, for most of them, they do not have the habit of using such technologies. This thesis aims to search a methodology able to observe and predict VLE uses. So we create a new model specifically adapted to study educational context. The uses were explained by a decomposition of the technology acceptance process, in reference to the TAM that we modify and extend to contextual factors. Through the construction of our model, we want to increase our capacity to understand and influence actual VLE uses in the Lorraine academia. At the end of this work, we should help the Region Lorraine to establish managerial guidance to supports more efficiently the implantation of his ENT called *PLACE*.

## References

1. Paquelin D. (2009). *L'appropriation des dispositifs numérique de formation : du prescrit aux usages*. Paris, L'Harmattan.
2. Martins I. L., & Kellermanns F. W. (2004). A model of business school students' acceptance of a web-based course management system. *Academy of Management Learning and Education*, vol. 3, n°1, p.7-26.
3. Ngai E. W. T., Poon J. K. L. & Chan Y. H. C. (2007). Empirical examination of the adoption of WebCT using TAM. *Computers & Education*, Vol.48, n°2, February 2007, p. 250-267.
4. Van Raaij E. M. & Schepers J. J. L. (2008). The acceptance and use of a virtual learning environment in China. *Computers & Education*, vol. 50, n°3, p. 838–852.
5. SDET (2011). Schéma Directeur des Espaces numériques de Travail. <http://www.educnet.education.fr/services/ent/sdet> (16th-07-2011).
6. MEN (2010). Ministère de l'Education Nationale. Bulletin officiel n°11 du 18 mars 2010. <http://www.education.gouv.fr/cid50863/mene1006812c.html> (16th-07-2011).
7. Attali J. (2008). *Rapport de la Commission pour la libération de la croissance française*, 2008, 245 p.(16th-07-2011).
8. Cherqui-houot I., Trestini M., Schneeweile M. (2010). Les usages d'un cahier de textes en ligne: Cas de l'ENT Lorrain, l'environnement PLACE. *Distances et savoirs*, vol. 8, n°2, p. 241-256.
9. Schepers J. & Wetzels M. (2007). A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. *Information & Management*, vol. 44, n°1, 2007, p. 90-103.
10. Triandis H.C. (1979). Values, attitudes, and interpersonal behavior, *Symposium on motivation: Beliefs, Attitudes, and values*, 1979, Nebraska, p. 195-259.
11. Davis F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, vol. 13, n° 3, 1989, p. 318-339.
12. Fishbein M.A.& Ajzen I.(1975). *Belief attitude, intention and behavior: an introduction to theory and research*, Reading, M.A., Addison Wesley.
13. Tricot A., Plégat-Soutjis F., Camps J.-F., Amiel A., Lutz G. & Morcillo A. (2003). Utilité, utilisabilité, acceptabilité: interpréter les relations entre trois dimensions de l'évaluation des EIAH. *Environnements informatiques pour l'apprentissage humain*, 15 to 17 April 2003, Strasbourg, France, p. 391–402, 12 p., [hal.inria.fr/docs/00/00/16/74/PDF/n036-80.pdf](http://hal.inria.fr/docs/00/00/16/74/PDF/n036-80.pdf) (04th-09-2011).
14. Davis F.D., Bagozzi R. & Warshaw R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, vol. 35, n°8, p. 982-1003.
15. Sanchez R. A. & Hueros A. D. (2010). Motivational factors that influence the acceptance of Moodle using TAM. *Computers in Human Behavior*, vol. 26, n°6, p. 1632-1640.
16. Subramanian G. H. (1994). A replication of perceived usefulness and perceived ease of use. *Decisions Sciences Journal*,vol 25, n°5-6, p. 863-874.
17. Venkatesh V. & Davis F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, vol. 46, n°2, p. 186-204.
18. Sun H. & Zhang P. (2006). The role of moderating factors in user technology acceptance. *International Journal of Human-Computer Studies*, vol. 64, n°2, p. 53-78.
19. McFarland D.J. & Hamilton D. (2006). Adding contextual specificity to the technology acceptance model. *Computers in Human Behavior*, vol. 22, n°3, 2006, p. 427-447.
20. Venkatesh V., Morris M. G., Davis G. B. & Davis F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, vol. 27, n°3, p. 425-478.
21. Jan A. U. & Contreras V. (2011). Technology acceptance model for the use of information technology in universities. *Computers in Human Behavior*, 27(2), p. 845-851.
22. Zapata A. (2009). *Pratiques enseignantes : Agir au service de valeurs*. Paris, L'Harmattan.

23. Hsu C.-L. & Lu H.-P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information & Management*, vol. 41, n°7, p. 853-868.
24. Malhotra Y. & Galletta D. F. (2002). Extending the technology acceptance model to account for social influence: theoretical bases and empirical validation. *System Sciences*, vol.1, 1999. HICSS-32. Proceedings of the 32nd Annual Hawaii International Conference, 14 p., <http://www.computer.org/portal/web/csdl/doi/10.1109/HICSS.1999.772658> (04th-09-2011).
25. Prensky M. (2001). *Digital natives, digital immigrants*. On the Horizon, Vol. 9, n°5, MCB University Press, p. 1-6.
26. Thompson R.L., Higgins C.A. & Howell J. M. (1994). Influence of experience on personal computer utilization: Testing a conceptual model. *Journal of Management Information Systems*, vol.11, n°1, p. 167-187.
27. Paré G. & Elam J. (1995). Discretionary use of personal computers by knowledge workers: Testing of a social psychology theoretical model. *Behavior & Information Technology*, vol. 14, n°4, p. 215-228.
28. Gagnon M.-P. (2003). *Déterminants psychosociaux et organisationnels de l'adoption des technologies de télémédecine dans le réseau québécois de télésanté élargi (RQTE)*. PhD Thesis, University of Laval, Québec. [citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.86.1785&rep=rep1&type=pdf](http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.86.1785&rep=rep1&type=pdf) (04th-09-2011).
29. Koohang A. (2004). Students' perceptions toward the use of the digital library in weekly web-based distance learning assignments portion of a hybrid program. *British Journal of Educational Technology*, vol. 35, n°5, p. 617-626.
30. Akreimi A., Ben Naoui N. & Gaha C. (2004). Les déterminants d'utilisation de la formation électronique: approche par les théories d'adoption des technologies. *1st European Conference on e-Learning and IS Education*. 17p., <http://basepub.dauphine.fr/xmlui/bitstream/handle/123456789/2076/ben%20naoui.pdf?sequence=2> (16th-07-2011).
31. Woods R., Baker J. D., & Hopper D. (2004). Hybrid structures: Faculty use and perception of web-based courseware as a supplement to face-to-face instruction. *The Internet and Higher Education*, vol. 7, n°4, p. 281-297.