

## **A MODEL FOR MEASURING THE STUDENT BEHAVIOR IN WEB 2.0. CLASS. CASE STUDY OF TOURISM STUDENT SPECIALIZATION**

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**Abstract:** *The digitization as a general phenomenon is influencing even the students we meet nowadays, making their expectations grow regarding the experiences offered by the eLearning context. At the global level it is found that the student as consumer of pieces of different content, with different levels of involvement as well as with a different level of attention is hard to be pleased. It is difficult to follow their interests and from here stems the difficulty of measuring the students' behavior. Our study will provide a model / tool for measuring the involvement of the student specializing in tourism within the courses by capturing levels of involvement in the course of learning and outlining their behaviour. We will compare the achieved results with the model of the student as it was imagined by the teacher when constructing the entire course. Our research will provide the specialized literature with conclusions on the impact of using collaborative environments in teaching and learning with implications and consequences on the improvement of digital skills.*

**Keywords:** education; learning; community; collaboration; Wikispaces; engagement

**JEL classification: A23**

### **1. Introduction**

It is in the 21<sup>st</sup> century that technology continues to reinvent each aspect of our existence and the aspect of teaching and learning is especially reinvented by it. According to (Conole,Alevizou,2010), the main objective that education has is to develop new abilities in order to extend the capabilities of the ones who learn with the purpose of preparing the learners for a world that is under the influence of changes, while the acquisition of new knowledge is becoming a secondary objective. It was in this context that a reconsideration of the theories and models of learning was imposed, according to three major axes: associative (the learning is achieved by means of structured tasks, such as the behaviourist approach adapted with the aid of Web 2.0 associative resources), cognitive (learning through understanding and reflecting over one's own learning – metacognition), and situational (learning as a social practice, with constructivism and connectivity bearing the most importance,through developing the communities of practitioners. The study has the purpose of illustrating a model of teaching that was conceived and implemented so that it would adapt to the new trends in the educational domain, while also considering the particularities generated by the introduction of

the IT&C in the economic domain. The central idea lying at the basis of our entire concept is to offer students the possibility to learn and acquire the way in which they can continue to gather useful information and to learn throughout their entire life by becoming aware of the fact that learning has a new dimension. The student or learner is presented with ways of acquiring new knowledge in the domain of tourism, while the secondary aim is for us to focus on developing new abilities and capabilities so that the learners would face the continuous changes from the domain in which they would eventually become experts, which in our case is tourism. "However, it's important to remember: integration of technology in bits and pieces doesn't help. A deeper incorporation is required. Sure, experiments fail. Speed bumps slow down the pace. But what is important to make it work is to iterate. Iterate until you strike the right balance" (Sharma,2016). In this context, our article can be integrated in an area of higher levels of education that is caught up between distopia and utopia, where the only viable solution would be to use digital technology as the tools to improve the student and the means to prove experience and achievement. One of the primary reasons to use wikis is because they help our students reach Bloom's higher order skills – things like creating and evaluating (Center of teaching). The article is structured in four parts or sections: the first is dedicated to a brief incursion in the specialised literature, followed by a presentation and outline of the purpose and methods of research that were used, a practical model to extract information within data; according to it, one can build a behaviour pattern of involvement in a course that is dedicated to learning about IT&C instruments that are used in assisting the decision-making process in tourism. The last section contains the conclusions, limits of research and the future subjects that would continue the present research.

## **2. Literature review of Wiki in Higher Education (HE)**

In the following section, the authors discuss cases that demonstrated the emergence of wikis as important tools in higher education. The first apparition of the role played by wikis in academic education according to (Sutton,2012) dates back to the mid 1990s. Wiki started to gain popularity in the area of research dedicated to teaching foreign languages and to written communication mediated by the computer (CMC) (Pennington,2003). According to Ware and Warschauer (2006), wiki allows the initiation of asynchronous discussions that can be combined with the interactive aspect of written conversations which would allow the measuring of not only the students' capacity to compose contexts but also their capacity to elaborate on specialized discourses. According to its nature, the wiki can be interpreted as an asynchronous instrument for communication that can withstand many composition principles regarding specialized texts. The idea sustained by (Purdy,2009), is that the wiki allows for the analysis of composition principles through evaluation, collaboration, continuous revising as well as forming and gathering common knowledge. In (Lundin,2008), it is demonstrated that the wikis ease the collaboration process by facilitating the interactions and developing the creative capacity of the student who wants to write. In (Godwin-Jones,2003), the wiki was utilized as a collaboration platform in the course rooms in the area of foreign languages. In (Mi,2012), one witnesses a reviewing and revival process of the studies related to wikis together with pedagogical implications and we have reached the conclusion that 4 big directions of research were most visible: the

collaborative writing process, writing product, perceptions of wiki-based collaborative writing, and effects of tasks. According to (Raman,Ryan & Olfman,2005) wikis are used in the context of advanced studies with the role of assisting knowledge management. According to (Ravid,Kalman&Rafaeli,2008), from the functional point of view, a wiki is meant to engage individuals in processes, to employ them, to regularly revisit pages in a collaborative way in order to add new information and to create links between pages. The conclusion of their study is that through a wiki we can develop an online manual regarding collaboration between students. The research of (Smith&Toland,2008; Robertson, 2008 and Ruth & Houghton, 2009) is added to these results, maintaining the idea that a wiki allows one to study the behavior of the student in the context of the academic learning and teaching process. Moreover, (Bruner,1990), completes the research by bringing solid arguments in favour of the idea according to which the wiki perfectly applies itself to the constructivist approach to learning, since the student is actively involved in creating knowledge, instead of absorbing it (Aiim,2016), (Lee,2010),(Sharma,2016), (Leung,KaiWahChu,2009). (Santosh Bhaskar,2013) focuses on the wiki analysis for the classroom with the following scenario: creating a wikiclass with the purpose of creating an environment that is more encouraging towards communication, thus enhancing the students' capacity to collaborate and work together, transforming them into facilitators of communication. They are able to post their work on the platform and see the comments presented by their colleagues as feedback. Therefore, wiki allows students to teach others. The motivation of such an environment is the following: the teachers and professors use wiki to motivate students in order for the latter to get more involved in the learning and teaching process. In the works of (Santosh,Bhaskar,2013),(Sutton,2012), (UD,2008), (Leung,Kai WahChu,2009), we get to analyse the impact of the wiki in the academic environment: for example, it *encourages non technical users, as they* can create and publish content with ease; thus, it *connects multiple resources* - wiki is a combination of Web pages linked together; this way, educators can provide students with as many resources as they can. It helps them learn in a detailed way. in subsidiary, this research as well as the information provided in (Felea,Stanca,2014), we see the authors focusing on the idea that the wiki is that element which increases the students' participation levels within the learning and teaching process. According to (Taylor,2011), student engagement has primarily and historically focused upon increasing achievement, positive behaviors, and a sense of belonging in students so they might remain in the classroom and have successful results. (Robertson,2008) supports the idea that using the wiki in facilitating learning at one's workplace is in accordance with promoting awareness, offering participants the opportunity to assimilate technology as the support in gathering new specialised knowledge in their field of expertise. In (Bruen,2010) we find the assertion that wikis are web spaces which are adequate to pursuing academic activities that offer the opportunity to gather information, to discuss and analyse the issues both individually and as a group. However, in (Lee,2010) we support the idea that the wiki has a positive impact on developing the students' writing abilities through collaboration and involvement. The conclusion of the study is that the educator, be it a teacher or professor, must offer the learners guidance by providing suggestions and advice with a view to efficiently use the materials and tasks in equally efficient feedback. To these conclusions that are all in favour of introducing wikis in the learning process, we add the results of

the study carried out by (Talbot,2012), according to which utilising a wiki determines the improvement of the student's work, the development of their professional competences while at the same time contributing to the improvement of the quality feedback formulation. It was in this context that we considered it useful to extend the area of research regarding the use of the wiki in the teaching and learning process that is found in the economic domain. In the present study, we have opted for creating a wiki environment that has the role of dashboard, and the one of the educator as facilitator. In our vision, the paper will contribute to the extension of the area of knowledge of the wiki as instrument of measuring the degree of involvement manifested by the student in the courses of tourism. The study is trying to validate the results obtained by (Talbot,2012) as they were reported and interpreted in accordance with the particularities of economic learning.

### **3. Statistical Study**

We intend to determine the types of involvement behaviours (engagement) of the students in the economic domain, together with the sub-domain of tourism in the process of learning and teaching the subject of Systems of Assistance for Businesses in Tourism. The hypothesis we started from is that Romanian students have an irregular involvement behaviour (Felea,Stanca,2010). More exactly, they become involved only if they are constrained to do so through various methods employed by the educators. This behaviour is perfectly applied to the profile of the Romanian student as it was observed after the moment of changing the type of learning from the elite university one to the mass superior system of learning transition. We have carried out a study on 52 participants to a course / laboratory, where we used a series of IT&C instruments that were dedicated to assisting business decisions. The teaching and learning process was a combined one in which we employed the wiki we had created as well as face-to-face meetings. The theoretical support as well as the assignments were all uploaded on the wiki, followed by detailed examples and explanations. The face-to-face meetings were aimed at explaining the theory as well as some practical aspects of the subject. In this respect, we used both classical and modern methods: short presentations, case studies and debates, powerpoint presentations created by students and professors, team work, etc. The advantage of such a system is that the educator has a general image of the student's overall behaviour throughout the entire course, being able to offer personalized assistance. Furthermore, the educator can determine the students to increase their levels of participation through different motivational factors and techniques. In what follows, we shall present the image of the wiki used as dashboard over the entire period of the 14 weeks of study. The wiki contains 10 pages, allowing for the navigation in all the other pages. In what follows, we shall perform a brief incursion in our wiki in order to present its structure. Here is how we structured the aatcsfsega space: a guard page (Home), in which we presented the general information about the course, the themes we tackled, each in a separate page that comprised different materials and tutorials as well as bibliography, etc.), together with evaluation possibilities. This online learning platform started out in the university year of 2015-2016, with the intent of developing and sharing the use of resources that were created for the study of the subject entitled Informatic Systems of Assistance in Businesses for the students of the Faculty of Economic Sciences and Business Administration in the Babes-

Bolyai University of Cluj, Romania. Finally, this has become a learning environment employed in assisting classes, laboratories and individual work based on the project. About wiki: Basic Notions, Wiki Tutorial, technical aspects, advice on how to learn online, organizing the course and demands, Course Content and material support for each unit course, themes: Seminars – Materials and Themes, Courses. Registering within the wiki was performed by means of an invitation sent via email that the student had to eventually confirm. The total number of subscribed students was of 51, and the user account consisted of a user name and a password. Moreover, each student had an email account at their disposal, with the possibility of completing their profile (Settings) with their real name and surname, also adding a photo.

### 3.1 Objectives

Implementing the wiki in the learning process destined to IT&C instruments of decision assistance in tourism has allowed us to check the degree of involvement manifested by the student in the learning process within 14 weeks. The involvement of the student from the educator's point of view represented the constant participation to courses both on the wiki and to the face-to-face meetings. The involvement of the student on the wiki was measured by means of the number of views and editings over the 4 months of course development. Within our analysis, we define the student's involvement as consisting of the following dimensions: the student is constantly involved in the activities all over the semester, behaving in a homogenous way and reacting to constraints. However, it would be ideal for them to become involved out of their own will, eventually. The educator has developed a wiki starting from the premise that a student would enter the surface of the wiki on an average of 3 times per week, with the purpose of doing his or her homework with the aid of the materials that are available in the wiki. In this respect, the wiki represents and fulfills the role of a dashboard and at the same time an environment of collaborative interaction in which the student can cooperate with other students and also with professors in order to successfully complete the given tasks. Here are our study hypotheses: I1. The students have no constant, homogenous involvement within the course. The alternative hypothesis: the students are involved throughout the entire duration of the semester; I2. The students do not have a homogenous behaviour throughout the semester. The alternative hypothesis is that they present homogenous behaviour throughout the semester; I3. The students do not get involved in the wiki activity without constraints represented by deadlines to hand in assignments. The alternative hypothesis: the students get involved in the wiki activity with the constraints represented by deadlines for handing in assignments. For the statistical study, we used SPSS 13.0 and the nonparametric tests Friedman, Kruskal-Wallis, and Marginal Homogeneity Tests. The decision to apply them was based on the results of the Kolmogorov-Smirnov test. We used the TwoStep method according to studies by (Bacher, Wenzig, Vogler, 2004), (Gower, 1971) and (Ichino, Yaguchi, 1994) in order to determine the optimal number of clusters existing in a set of mixed data. The study was carried out on 52 students enrolled in the first year of study of the Master's Degree of Tourism from FSEGA, UBB Cluj-Napoca, out of which 76.9% are of the feminine sex and the rest of 23.1% are of the male sex. The real behaviour of the student within the wiki over the period of the 2015-2016 university year is illustrated by the results of the descriptive analysis which is described in what follows:

1. The average number of views in Oct. was of  $7,83 \pm 4,264$ , 95%CI (6,64;9,01)
2. The average number of views in Nov. was of  $42 \pm 71,743$ , 95%CI (22,03;61,97)
3. The average number of views in Dec. was of  $58.54 \pm 91.26$ , 95%CI (33,13;83,95)
4. The average number of views in Jan. was of  $152.46 \pm 117.89$ , 95%CI (119,62;185,31)
5. The average number of views in Feb. was of  $26.44 \pm 39.116$ , 95%CI (15,55;37,33)
6. The average number of editings in Oct. is of  $1,63 \pm 2,258$ , 95%CI (1,01;2,26)
7. The average number of editings in Nov. is of  $1,65 \pm 2,009$ , 95%CI (1,09;2,21)
8. The average number of editings in Dec. is of  $3,92 \pm 3,06$ , 95%CI (3,07;4,78)
9. The average number of editings in Jan. is of  $4,88 \pm 2,777$ , 95%CI (4,11;5,66)
10. The average number of editings in Feb. is of  $2,13 \pm 1,990$ , 95%CI (1,58;2,69)

The study continued by checking the hypothesis that the students have no constant involvement within the course. The alternative hypothesis is that students do get constantly involved in the course all throughout the semester. The first step consisted of applying the Kolmogorov-Smirnov test, according to which ( $p=0.000 < 0.05$ ), data which were not normally distributed. In order for us to apply the statistical hypothesis we applied the Kurskal-Wallis test for independent and unequal samples. The result of the Kurskal-Wallis test for the view (Chi-Square=69.253, p-value=0.000) and for editings (Chi-Square=53.475, p-value=0.000) imposes the rejection of the null hypothesis and accepts the alternative one as valid. The conclusion we can draw is that the students have various degrees of involvement from one month to the other in course activity. In this context, we have proceeded with testing the following null hypothesis: the students do not have a homogenous behaviour during the semester and the alternative hypothesis is that they actually have it during the entire semester. The result of the Marginal Homogeneity Test imposes the rejection of the null hypothesis and accepting the alternative one becomes valid.

**Table. Marginal Homogeneity Test**

	View-edit Oct	View-edit Noiembre	View-edit dec	View-edi lan
Mean MH Statistic	1295,500	1725,500	4167,500	882,000
Std. Deviation of MH Statistic	288,626	377,591	673,488	157,493
Std. MH Statistic	3,078	3,492	5,584	3,073
Asymp. Sig. (2-tailed)	,002	,000	,000	,002

Therefore, within the study we can conclude that the students have homogenous involvement behaviours, more exactly a student with intense activity within the first month of the course maintains his or her degree of involvement throughout the entire course, while the students with a low level of involvement during the first

month of the course will manifest a low level of involvement or a fluctuating one until the end. The study continued with checking the hypothesis stipulating that the students do not get involved in the activity of the wiki without constraints regarding the deadlines for submitting assessments; alternatively, the students do get involved in the wiki activity with constraints related to the deadlines for presenting assessment. In order to test this hypothesis we used the Friedman Test. In the case of the views, the result of the Friedman Test is that (Chi-Square=72,892 ,p=0.000), so the null hypothesis is rejected and the alternative one is accepted. The statistical analysis continued with the application of the Wilcoxon non-parametric test in order to check if there are significant differences between the number of views achieved by the students within the wiki. The results show significant differences between Oct-Dec (Z=-3.999,p-value=0.000); Oct-Jan (Z=-6.139,p-value=0.000); Oct-Feb (Z=-3.617,p-value=0.000); Nov-Jan (Z=-5.673,p-value=0.000); Dec-Jan (Z=-4.633,p-value=0.000); Dec-Feb (Z=-2.998,p-value=0.003); Jan-Feb (Z=-5.508,p-value=0.003). In the case of the edits of the Friedman Test result (Chi-Square=34.124 ,p=0.000), so the null hypothesis is rejected and the alternative one is accepted. The statistical analysis continued with the application of the Wilcoxon non-parametric test in order to verify if there are significant differences among the number of edits done by the students within the wiki. The results show significant differences between Nov edit – Oct edit (Z=-0.863,p-value=0.388); Dec edit – Oct edit (Z=-3.650,p-value=0.000); Jan edit – Oct edit (Z=-4.656,p-value=0.000); Feb edit–Oct edit(Z=-3.705,p-value=0.000); Dec edit – Nov edit (Z=-4.624,p-value=0.000); Jan edit – Nov edit (Z=-4.624,p-value=0.000); Feb edit – Dec edit(Z=-2.278,p-value=0.023); Feb edit – Dec edit(Z=-2.596,p-value=0.009); Feb edit –Jan edit(Z=-3.996,p-value=0.000). The conclusion to be drawn from this stage of the analysis is that the students get involved in the activity provided by the wiki as long as they are constrained to do so. In this context, we continued the analysis with the application of the TwoStep method in order to trace the number of clusters that exist within a sum of data of different types. The null hypothesis is this stage is the following: there are no differences among the groups of students generated by the levels of involvement in the learning and teaching process of IT&C in assisting the decision making process in the touristic domain. With the purpose of validating/ invalidating this hypothesis, we applied the cluster analysis on basis of the studied variables. The null hypothesis is rejected and the result demonstrated that the students are grouped in 2 clusters, according to the studied variables. These studies are characterised by the fact that the value of the inter-class inertia significantly surpasses the values of inertia within the same class. As a result, from the standpoint of the degree of interest for study, by direct involvement in the learning and teaching process of IT&C in assisting decision-making in tourism, we have observed that view(F = 116.129; p = 0,005) and edits (F = 64.677; p = 0,03). The result of the cluster analysis (the k-means method) according to the studied variables demonstrates the fact that the students are grouped in 2 clusters according to the attributes under study, as follows: 1. The first cluster of students – 64% comprises the person with a low level of interest for IT&C decision assistance in tourism, while the number of persons with a high level of interest is very low. The participation and level of involvement in the theoretical and practical activities of the course is situated under the average of participation predicted by the educator as being necessary for assimilating knowledge that is provided by the course. The marks obtained by the

participants vary between extremes. From 10 to 7 and even some lower than 6.; 2. The second cluster of students - 36% includes the persons with a high level of interest in the IT&C decision making assistance in tourism. The participation and level of involvement in activities throughout the semester is high and is situated above the limit of participation settled by the educator as being necessary for assimilating the knowledge that is provided by the course. The marks obtained by the participants range between 8 and 10.

### 3.2 Discussion

The views, edits and posted commentaries during the 4 months were all taken into account per student, but also per item taken from the wiki page. For the I1 hypothesis we applied the Kruskal-Wallis “test for independent and unequal samples”, and the result was that the students present varying degrees of involvement from one month to the other during course activity. For the I2 hypothesis we applied the Marginal Homogeneity Test and we discovered that the students present a homogenous pattern of behaviour during the first semester, while for hypothesis I3 the Wilcoxon non-parametric test was applied, proving the fact that the students become involved with the wiki activity only under constraint. We can affirm that after the analysis of the three hypotheses there are no differences between the reactions of the students as they are generated by the levels of involvement in the learning and teaching process of IT&C in the decision making process characteristic of the touristic domain. The null hypothesis was rejected and the result of the cluster analysis (the K-means method) according to the studied variables demonstrates the fact that the students are grouped in 2 clusters according to the attributes taken in the study. Taking the analysis further, we have come up with the following conclusions: 1. There is a low proportion of students who are constantly involved in theoretical and practical activities involved by the course and the knowledge assimilated in the course are the ones expected by the educator at the moment of implementing the wiki; 2. The results of the study support the idea that although the students are daily consumers of technology and different parts of content, they are not willing to become constantly involved in the assisted learning process of collaborative environments of teaching and learning; 3. The conclusion that can be drawn from the study is that the involvement of the young specialist in the development of a basic subject reported to the level of the year 2016 is maintained as being a mostly fluctuant one in terms of the level of attention and involvement, generating a student profile that is hard to please and difficult to observe. 4. The will and motivation of the students to learn by using all the methods of learning placed at their disposal is low in the absence of an external stimulus. Therefore, the conclusions of the study performed by (Talbot,2012) are not totally validated by the results of the study. Our study proves that the use of the wiki in teaching and learning is usually positive, generating an improvement of the quality of the work performed by the student through assimilation and developing of the students’ professional competences. Moreover, the study supports the results of (Lee,2010 ), according to which the teacher must guide the students by offering them suggestions and advice for the efficient use of materials and tasks.

#### 4. Conclusion

Academic education is an actual subject not only in Romania, but also all over the world, being given a lot of consideration. The IT&C technologies influence education more and more in all of its levels (primary, secondary and tertiary) and in all its forms (formal, informal and non-formal education). The reconsideration of the theories and models of learning has taken place over three major axes: associative, cognitive and situational. The digital competences together with knowledge in one's field of expertise are the demands that the Z generation has to fulfill. By means of this study, we are trying to establish a need for implementing a wiki in the teaching-learning relationship at an academic level. We have determined the types of behaviour related to the involvement of the students in the economic domain and the touristic sub-domain in the process of teaching and learning by means of IT&C. The hypothesis we started from was that Romanian students have an involvement behaviour that is not constant, lacking consistency and being irregular. They only become involved when they are constrained to do so by their teachers or professors. (Stanca, Felea,2010). As other specialists in this domain, such as (Lee,2010), (Talbot,2012), (Reka Asztalos)(Felea,Stanca, 2014)(Popescu), we have come to the conclusion that the wiki can help students develop certain formative and informative valences and skills, with positive effects of their critical thinking and creativity. Furthermore, the wiki could improve their digital competences at both an individual and group level, with the students thus exercising their most important competence for creating content, learning by participating and discovering the online environment. The results of the study demonstrate that the collaborative learning environments cannot change the attitude of the student towards the teaching and learning process. A high percentage of students would only get involved in the learning and teaching process under constraint, which goes to show that the faculty and one's course of learning is usually chosen by other criteria than the ones related to the passion and interest for a certain domain. We have retained the fact that web 2.0 is more than a set of instruments and services, being the idea which presents a significant potential for learning" the reality of the content used by the user, the effects of numerous participation in network and the openness that university education implies towards easy access. Its applicability implies student involvement and interaction in learning, as well as assuming learning management by the student, (Felea,Stanca,2010), (Grosseck,Holotescu,2012), (Popescu,Cioiu,2011), (Apostu,2011). As a conclusion of all the aforementioned, "the results show that students are able to adapt the wiki technology for academic tasks, but that the task may impose constraints on the use of wikis, leading to some of the advantages of the technology being lost in this adaptation". (Elgort,2007). The limits of our research consist of the reduced number of students involved in the process as well as the reduced time period in which they were subjected to the analysis. On the other hand, at this stage it is unclear whether wikis can be used to promote student engagement or create student-driven course content suitable for assessment.(Cole,2009). In future works we should prove the existence a direct relationship between using the wiki in education and the results of the students; we should also find pedagogical structures of learning in order to promote collaborative behaviours among students as long as these patterns cannot be directly evaluated.

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