

# Digital Native Students' learning expectations in Higher Education

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## Keywords

Teaching policy, survey, digital natives, students' expectations

## 1. SUMMARY

This paper presents the results of a wide survey conducted in 2013, repeated in 2016, among 17,000 then 19,000 students at the University of Applied Sciences Western Switzerland (HES-SO), to better apprehend how students consider their training, their relationship to technologies and their expectations as "digital natives" students with regard to teaching. This bottom-up approach included digital native students' expectations, needs and requests concerning tools and new teaching approaches. The outcome of the two surveys depicts the new student who enrolls into higher education institutions. This paper presents the combined results of these two surveys and the measures ensued, namely the development of training modules on digital change and the design of an adaptative Moodle quiz.

## 2. STATEMENT OF THE PROBLEM

The "new" student, called by Prensky (2007) "Digital native", is no longer passively listening to lectures. His ability to concentrate has decreased (short attention span), while the use, in the classroom of communication mobile devices has increased in parallel. Besides, this student wants to participate, to be active and give his opinion in the same way he is accustomed to interact using social media. (Prensky, 2007) Family educational methods based on dialog, integration in a more horizontal society, the immediate access to a plethora of knowledge available on the Internet, have contributed to shaping up a student who considers himself as a course co-expert rather than a consumer of resources. (Oblinger, 2005) For this student, the act of thinking has become more important than theory itself, beliefs take the upper-hand on facts, authority has no genuine hold on them (Tapscott, 1998). Digital natives prefer to: obtain information rapidly from multiple sources, work in multi-tasking and parallel modes, learn using image, sound and video rather than texts, learn what is immediately pertinent.

These characteristics are commonly attributed to the Digital native generation :

1. Use technology as a natural part of their lives,
2. Hedonist,
3. Live in present,
4. Need various activities,
5. Short attention span,
6. Preponderance of visual (video, picture, etc.),
7. Consider professor as part of the teaching/learning process, not the center, want other contributions than professor's,
8. Professor has the role of facilitator,
9. Zapper, gamer,
10. Cooperation work,
11. Communication and peer exchanges are center of their lives,
12. Pragmatic,
13. Need meaning and pleasure in work,
14. Need to be valorized through constructive feedbacks,
15. Co-expert and content producer.

These observations on generations must be qualified on two issues. The first point concerns the opposition between students and professors. According to Prenzki (2001, 2007), the students are « native speakers » in digital computer language, video games and the internet, whereas the professors are mainly "digital immigrants" born before the emergence of computers and the internet. Actually, the borders are more porous. Indeed, the usage of technologies, their ease of manipulation, their impact on apprehending the world, also concern people stemming from older age groups.

The dissemination of mobile technologies since 2007 has altered this dichotomous vision, opposing the natural experts and the non-informed amateurs. The second point concerns the division of digital natives into generations, namely the baby boomers (1950-1960), X (1960-1980), Y (1980-1995), Z (1995-today) (managerial approach), which appears to be subject to acceleration and blurring of codes as the letters keep scrolling. The social habits of users of technology seem to co-exist among generations whose differences due to age are shrinking: the gap between generations Y and Z is loosening and it is common to identify some Y and Z, even X characteristics, among people who should theoretically belong to a precise generation. With standardization of how information is accessed, how the news is, for instance, delivered in short, rapid formats, confusing the importance of events, platforms proposing series in streaming, abandon of traditional entertainment formats (cinema, television), impact the entire generational groups. Thus, « it is likely that digital nativeness is not defined strictly by age, but by embodied practices in part defined by their age. » (Jonas Eduardsen, 2011)

## 2.1 Context

In 2019, more than 21,000 students enroll in the different curricula proposed by the University of Applied Sciences Western Switzerland (HES-SO). This university offers students strong links with the real professional environment, either via very concrete courses (laboratory work, experiments, etc.) or by helping with developing projects ordered by professionals in action.

Courses are provided by lecturers in frontal learning situations, but HES-SO enriches its pedagogical concept by including blended learning to the curriculum. Right now, more than 8,000 online spaces complement the regular courses on a Moodle platform (<http://cyberlearn.hes-so.ch>), used daily by more than 27,000 people (students and professors).

To sustain the expansion of educational technologies at the HES-SO, the e-learning Centre Cyberlearn offers various services, ranging from LMS Moodle administration to specific resources development, Moocs or mobile devices. Ever since 2011, Cyberlearn has been addressing the issue of new learning profiles.

## 2.2. Surveys

Cyberlearn wondered if teaching at the tertiary level should take into consideration digital natives characteristics and alter its HES-SO pedagogical models. This led to the question: Is the Digital native student already present at university level? In an attempt to answer, the HES-SO e-learning Center launched, in 2013, a survey among 17,000 students studying at the institution. Some 800 students answered 30 questions comprising 20 closed and ten open questions. The aim was to investigate 1) the students' habits when using the Internet, social media, mobiles devices 2) how the students assessed teaching methods and their professors and 3) how do they describe their ideal course as a Digital Native.

To ensure for the results to indicate a truly new tendency in the tertiary level, the Center conducted the same survey in 2016, among 19,000 students, after the 2013 students had completed their Bachelor cursus. 387 students responded to the second survey. In both cases, the survey results were statistically significant (confidence level: 95%, confidence interval: 5%), and were delivered on the LMS Moodle, which is accessed daily by 90% of the bachelor students of this University.

52% of the respondents were women, 48% respondents were men, which is consistent with the gender distribution at the HES-SO. 80% of the participants belonged to the 18-25 age group, which is the Digital natives generation group.

## 2.3 Major conclusions

### a. Generalities

In 2016, 8.5% students owned an e-reader, 36% owned a digital tablet, while 97% owned a smartphone and 93% a laptop, meaning that the students are over-equipped. Among them 55% wished to use their smartphone as a learning means. Compared to 2013, mobiles devices have been progressing (+16.18%), as well as e-reader devices (+5.15%) and smartphones such as Android (+11.53). The use of personal computers has decreased by 2.7%, laptops are also being impacted by this decrease.

93% of the students access the Internet during their courses, 43% because they enjoy performing several tasks concurrently, 37% to check on the data delivered by the professor, 44% because they are bored (multiple choice). It is interesting to note that more than one third of the students cross-check the "authority" data with sources found on the Internet. The number of students supplementing data delivered by the professor has increased significantly by 8.09% between 2013 and 2016. At the same time, the number of those surfing during class and engaging in several activities concurrently, increased substantially by 8.53% and 11.46%. Such results also indicate that professors use the internet more often in the classroom, and that the students' attention tends to be dispersed.

89% of the students use their smartphone during the courses, among them 70% check their messages, while 83% chat on instant messaging applications such as Whatsapp. 87% of the students are active on social media, Facebook placed in the first position among the social media used, closely followed by Instagram ((+32.92%)). The number of students never using their smartphone in class decreased significantly in 2016 (-13.66%). If in 2013, more than 75% used their smartphone, the percentage reached nearly 90% in 2016.

Considering educational resources, 72% of the students appreciate detailed graphs and explanatory videos, 60% prefer to attend courses in the form of workshops and 48% mention the video as the learning resource ranking first in their preference.

70% consider the courses interesting, while only 19% consider them modern, among other items.

To the survey item "according to you, what is the best means for learning" (multiple choice), the students vote in detailed graphs and explanatory videos (71%), notetaking (57%) with a significant drop 9% drop in 2016, compared with 2013. 51% select "listen to the professor", while 50% claim to prefer reading over summaries and 47% to learn by explaining to their classmates.

Various pedagogical models were proposed to the students. Lectures followed by individual exercises remain the model preferred by a majority of participants (52%), in competition with courses in the form of workshops (48%).

The preferred learning devices are videos (50%), quizzes (49%) and simulations (48%). Mobile applications rank 5<sup>th</sup> out of 9 positions in total.

## 3. DISCUSSION

### 3.1 Ideal course

One of the most interesting items of the survey consisted in asking the students, in an open question, to design their ideal course. 55% of the survey participants provided very detailed propositions in 2013, a total of 549 descriptions among 800 participants, and in 2016 (68.6%), a total

of 159 descriptions out of 387 (41%). Generally, the answers were rather long (several lines). They were sorted by keywords and combined into pedagogical categories.

### a. Keywords

In 2013, the most highlighted words are interaction, practice, videos and professor. As the HES-SO is a "university of work experience" the strong emergence of the keyword "practice" is coherent with its idiosyncrasy. Another highlighted word is interaction, referring to interactivity when acquiring knowledge, and also referring to interactivity among the participants.

As pinpointed by Prenzki (2007), the need to be active constitutes one of the main characteristics of Digital Native students. The notion of « video » spreads well beyond other learning resources (paper, podcast, quiz). YouTube, the largest worldwide video platform, scores 1.8 billion logged-in viewers monthly (DMR, 2019) . On a daily basis, 1,5 billion users spend an average of 1 hour watching videos (Webrank, 2017). Among 10 monthly users of YouTube, 8 are over 25, while 52% access the platform to obtain information, learn and progress, and the time spent watching Family and Education contents on YouTube increased by 140% between 2015 and 2016 (Webrank, 2017).

It is interesting to note that the notion of « professor » ranks at the 4th position in the panel of the most mentioned keywords, indicating that he maintains a central place in the educational ecosystem in the eyes of this generation of students.

In 2016, the keywords « interaction » and « practice » maintain their predominant ranking, while "videos" is progressing slightly. On the other hand, paper disappears from the list. The "on-line" training devices, "flipped-class" and "mooC" appear and progress. The notion of professor disappears, probably covered under the keyword "lecture". Thus, the keywords for 2016 provide a division between the notions proposed by the students: distance but group, workshops, games, practice, interaction but lectures.



Fig 1 : Tag cloud 2013



Fig 2 : Tag cloud 2016

### b. Pedagogical categories

In order to polish the survey's participants pedagogical concern, we regrouped the keywords into six categories: professor (person), resource (learning material), method (learning means), model (learning device), exchange (between participants, with knowledge) and organization (productivity).

Both graphs below show a shift of the concern towards learning models, exchanges and learning methods. This could prove a marked interest for the design of macro devices, suggesting that 2016 students stand beyond resource consumption design (micro) to think more globally, more conceptually, about their training compared to those in 2013. It must be stressed that, although the

HES-SO provides a wide range of training courses (arts and design, business, services and management, engineering and architecture, health sciences and social work), the pedagogical courses aimed at the current or future professors are not provided by the HES in Switzerland, but by dedicated schools, the Pedagogical HEP institutions. This implies that the participants of this survey do not belong to the group of future teachers with a specialized studying background in educational training or learning methods.

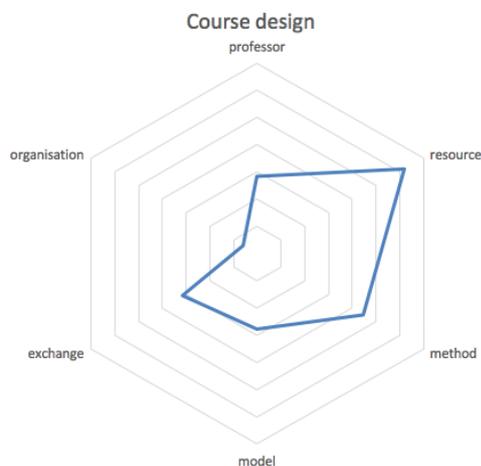


Fig 3 : Pedagogical categories 2013

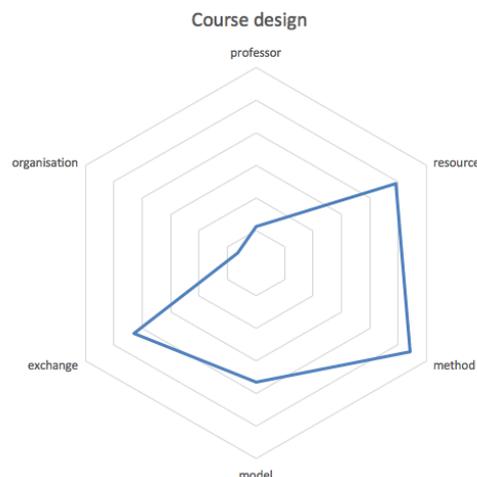


Fig 4 : Pedagogical categories 2016

### c. Statements

Among remarks made by many students, some accounts were selected:

a. *"The best course is the course where theory is explained briefly and clearly, in a modern way by the professor, followed by practical situational exercises involving the students"*: can be related to 3 points of the Digital natives' characteristics: 4. Need various activities, 5. Short attention span and 6. Preponderance of visual (video, picture, etc.),

b. *"A course with little time spent on theory to have more time for exercises, and with the professor available if needed."*: can be linked to statement 7 of Digital natives' characteristics list: Consider professor as part of the teaching/learning process, not the center,

c. *"A little theory, group workshops, lots of videos, images, games to make the course more entertaining than a course based on PowerPoint which must be listened to passively."*: this is consistent with statements 4. Need various activities, 5. Short attention span and 6. Preponderance of visual (video, picture, etc.),

d. *"A maximum of 15 students per classroom (currently 32) to facilitate theoretical learning (less noise, better concentration) and practice (more individualized, more time dedicated to help when working in pairs and for answering specific questions) a pedagogical professor attentive to the students' needs and adapting to situations. A course with a variety of pedagogical means to deliver information (short videos, flipcharts, mindmap, combined with practical experience, text script respected but not in PowerPoint, and also available on Moodle, and to finish a short multiple-choice quiz comprising 20-30 items on the topics taught in class."* This statement can be linked to three Digital Natives characteristics: 4. Need various activities, 10. Cooperation work, 11. Communication and peer exchanges are center of their lives,

e. *" Classroom courses (traditional setting), with exercises to be completed individually or in groups, and which can be done via the internet. Any mistakes in these exercises should be highlighted and explained. The professor would be available for more detailed questions when more explanation is*

*required.* ": linked to statements 10. Cooperation work, 11. Communication and peer exchanges are center of their lives and 8. Professor has the role of facilitator,

f. *"Preparing theory during class time, making exercises alone, coming back to class to speak about exercises together. Besides, I love when professors show us other opinions, such as TED videos."*: this can be related to point 7: Consider professor as part of the teaching/learning process, not the center.

g. *"As a reminder, a course must be prepared and teachers must think about changing techniques every 7 minutes, students' attention drops at this rate."*: consistent with statement 5. Short attention span and 9. Zapper, gamer,

These statements summarize well how Digital Natives see the learning process and environment. The professor's role becomes more a guidance role, while the interactive educational resources, the use of the video, the practical applications and interactions with the peers, constitute the main items of a new pedagogy at the university. It is remarkable that statement f. present professor's knowledge as "opinion", likely to be changed by other "opinions". The professor is no longer the only knowledge holder.

It came as a surprise to note that our students correspond to a truly new student profile close to the descriptions provided for the "digital natives", but also to observe how they manage to think over course design and training models, just as training professionals. Indeed, these students reach the tertiary level 5 years after compulsory school, and have attended about fifteen years of primary, secondary and professional schools, during which they acquired an empirical knowledge for learning methods, but also insight into efficient teaching methods.

## 4. MEASURES

### 4. 1. At the operational level

Three actions, set up by the HES-SO e-learning center Cyberlearn, ensuing from the surveys' results, were implemented to provide our students with suitable tools. The first consisted in developing a Moodle plugin to be set up in the list of the usual activities provided on the platform: e-voting for Moodle<sup>1</sup>. This voting activity helps professors increase interactions between professor-knowledge-students in classrooms with middle and large student group sizes. Many such activities are available on the internet, but it is the first time that this activity is embedded in the Moodle platform, facilitating the professors' job when supplementing the course, without leaving the platform.

Secondly, we "moocised" Moodle platform to provide moocs<sup>2</sup>. Some of these on-line courses are provided to students as a supplement to their regular courses, diminishing the hours spent in the classroom. They enable face-to-face teaching on interactions, examples, practice, while shifting theory delivery to the Moocs. Although the offer is still slim today (5 moocs), it is expanding every year. For example, since 2019, a fee-paying Mooc with credits for a CAS in sustainable finances, is provided 90% at a distance.

The third action aims at developing a customizable quiz system. Data connected to the quiz answers is analyzed via a system using weighting scores to sort the users' behavior during the quizzes. The new quiz activity uses these scores, and when the items are delivered to the users, will automatically "morph" the quiz to customize it to the probable users' behavior. Example: User Behavior: Big data analysis shows that the average user retaking a quiz, abandons it after 6 items. The course designer sets up the wished number of items (20, 30 or more). The algorithm automatically adapts the quiz distribution to the student's specific behavior (less than 6 items). This resource participates in the general tendency for customizing learning resources, based on participants behavioral analysis.

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<sup>1</sup> Download here : [https://moodle.org/plugins/mod\\_evoting](https://moodle.org/plugins/mod_evoting)

<sup>2</sup> Moodecx project here : <http://www.moodecx.ch/>; HES-SO Moocs : <https://moocs.hes-so.ch>

## 4. 2. At the institutional level

The HES-SO is now designing a digital educational model, providing professors with specific training modules (moocs), according to the university education policy addressing the digitalization of tertiary institutions. The purpose of these modules is to enhance professors' digital skills to adapt their teaching to the demands of the new students. Thus, the survey results provided interesting input, integrating the student's point of view in the educational policy of the institution.

## 5. CONCLUSION

A new milling of the survey "Digital Natives" will be launched in 2020, with an objective similar to the two previous surveys: outline the technical-pedagogical generational profile of students this time more oriented towards "Z" profiles than "Y" profiles. However, the survey will deal more specifically with issues on personal learning methods, considered by students as the most efficient. This will both measure the evolution of the learners' profiles, and identify which responses best meet individual and specific requirements and needs.

Through these surveys, HES-SO wants to better take into account the needs of new generations of students to be part of their training as a co-expert and no longer as a consumer. This undoubtedly will contribute to allow the institution to adapt to societal changes influencing the tertiary education system.

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## 7. AUTHORS' BIOGRAPHIES



Anne-Dominique Salamin is a full-time UAS professor and head of the e-learning Center HES-SO Cyberlearn. In 2015, she created the Enhanced Students Laboratory (Enslab) dedicated to the study of the impact of innovative and disruptive technologies on learning such as VR/AR and robot-student coupling. She holds an MSc in Educational Sciences from the University of Lyon Lumière II, and a DEA in distance learning from the University of Montreal (Can). Her research expertise is based on education, digital natives, multimodal platforms, mobile learning and cognitive processes in learning in distant environments. She teaches communication at the undergraduate level and supervises master theses on data processing and e-learning in general. She regularly attends international conferences and won the best paper award in 2014 for her writing on gamification at the university.



Nicole Glassey Balet is an UAS professor at the Institute of Management Information Technology at the HES-SO Valais-Wallis and a member of the Cyberlearn committee. She holds an engineering degree in mathematics from the Ecole Polytechnique Fédérale de Lausanne (EPFL). She teaches programming, algorithmics and operations research. Her Ra & d activities focus on e-learning and mobile application development as well as project management related to databases. Nicole Glassey Balet is also active in promoting girls in STEM professions.