

The Impact of Digital Natives on Blended Learning Scenarios

Gögele S., Schweiger G., and Kletzenbauer P.

Abstract—Digital natives are currently challenging higher educational institutions in Austria as they demand different learning and teaching approaches – calling for major educational reforms. This is especially true for part-time degree programmes whose courses mostly run in form of blended learning modules. Meeting the needs and interests of digital natives is thus a constant concern of the IT faculty at the University of Applied Sciences FH JOANNEUM. A recent online survey among their current students and applicants (in total 150 students) revealed that it takes more to engage students in blended learning environments than simply manage course content over an online platform. From the survey, it could be concluded that new ways in teaching and learning have to be found for learners and teachers to profit from this paradigm shift. In this context, technology plays a crucial role inside and outside the classroom as it seems to be the most suitable to explore students' engagement with the content taught. The analysis of the survey shows that the use of technology, especially in blended learning scenarios, is a complex and dynamic process and needs to be explored in detail in order to not only strengthen the cognitive learning habits but also the learning outcomes of digital natives.

Index Terms—Digital natives, future of learning, learning scenarios, study environment.

I. MEET GEN Z

Ref. [1] introduced the term Gen Y (i.e. digital natives) and referred to a generation, born after 1980, who were the first introduced to connected computers. Gen Z takes this term to a new level. Born in 1996 and later, these students grew up not only with computers and internet access, but also with smartphones, social media, and mobile devices. This shift in technology has also had an impact on how digital natives act, behave and communicate. This is clearly visible in the area of education.

The pace of technology does not overwhelm them because they are used to a dynamic, constantly changing and visually-driven lifestyle where a book in hard-copy form belong to the past as well as the need to look up information in a respective source (i.e. encyclopedia). In fact, any kind of information is just a swipe away on their smartphone and this is often the reason why their level of engagement very often does not resonate with what is offered in class. In fact, teachers are no longer seen as sole content providers. The traditional chalk-and-talk approach seems to be outdated. Many

Manuscript received January, 2020; revised September 13, 2020.

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universities have already acknowledged this development and that is why curricula decisions, learning environments, and innovative learning scenarios are on the daily agenda of stakeholders and educators alike. In this evaluation process, students' voices are granted more emphasis since they provide us with feedback why they engage with learning or not.

The Institute of Internet-Technology- and Applications at the FH JOANNEUM is currently evaluating their Bachelor part-time degree program. Although the numbers of applications have tripled in the last four years, it seems that is becoming more and more difficult to meet learners' needs within blended learning environments. This observation was further supported by the institute's biannual evaluation processes in which students provide feedback on lectures, seminars and lab exercises. In order to understand our students better an online survey (surveymonkey) was conducted, in which we invited current and future students to elaborate on questions about the efficacy of online classes, their engagement with the online platform, the material provided, and the use of technology in and outside the classrooms.

Based on the findings, we conclude that a constant evaluation of teaching and learning is necessary to meet digital natives where they are, namely at the point of time. This means that learning and teaching, especially in settings outside the original classroom, have to adapt to a new setting where active in class teaching belongs to the past. The survey revealed some useful insights on how to make classes more tech-oriented from the didactic point of view and thus more engaging for future students.

II. PROCEDURE FOR PAPER SUBMISSION

Ref. [2] point out 10 characteristics of digital natives. They are:

- 1) Digitally Literate: Since digital natives, who can also be called net generation, grow up with widespread access to technology and the Internet, they have the higher ability to use variety of technological devices and navigate through the Internet.
- 2) Connected: Especially with the developments in mobile technologies, this generation is always connected and stays on.
- 3) Immediate: Since they are multitasking and moving quickly from one activity to another, they can perform much more things simultaneously and perform with a higher speed.
- 4) Experiential: This generation prefers learning by doing rather than being taught passively by an instructor. They learn while exploring.

5) Social: They have high level of tendency to share through web, to interact with others and to show their online presence or in class presence.

Ref. [2] further claim that they like to work in teams (6.) instead of reaching learning goals alone. Structure (7.) is important too. Another interesting characteristic is point eight: Engagement and Experience: These generations need to interact and need to discover inductively. The authors finally conclude that the classrooms need to be visually appealing (9.) "Digital native learners need image-rich environments instead of text-oriented ones. They don't like long readings and prefer graphical information like infographics" (ibid.) Finally, point 10 refers to Things That Matter, which means that students have to meet authentic situations to understand that what they learn matters in the real world too. In other words, they want to be actively involved in the learning process.

III. THE BLENDED LEARNING ENVIRONMENT @ IIT

More than 300 students at our department are enrolled for part-time degree programmes. This means that more than 50% of their education takes place outside the campus in virtual classrooms. The courses are organised in face-to-face sessions, synchronous online classes and asynchronous units. Together, they are designed as blended learning modules. This particular setting is challenging for teachers and students alike. Teachers struggle with designing blended learning modules that meets students' requirements whereas students are rarely prepared for this challenging setting due to their previous education and thus have difficulties to find time, confidence and motivation to engage with this form of education.

Despite these challenges, students in our department still prefer blended learning modules over traditional teaching as they see several benefits in them:

1. digital tools, they have grown up with, support their learning endeavours
2. online resources complement their classwork
3. an educational platform (in our case Moodle) facilitates their engagement with complex subject matters taught face-to-face
4. students are in control of their own learning pace as access to the platform and other digital tools is always possible

Innovative didactical concepts are therefore at the core to run successful blended learning modules. The next chapter briefly summarizes the main didactical concepts which are driven by technology and thus particularly engaging for digital natives.

IV. DIDACTICAL CONCEPTS OF BLENDED LEARNING ENVIRONMENTS

A. Mobile Learning

Mobile Learning offer learning opportunities with the help of smartphone apps [3], where a classic desktop computer system would arrive at its limit. Various studies [4] deal with the ranking of these apps and include, among others, features such as note-taking or access to learning management

systems (e.g. Blackboard or Moodle). Within mobile learning, provides such as Code Academy, Coursera, edX [5], but also iTunes U do play an important role to create an efficacious mindset for technology-based learning and teaching. A further exciting approach is provided by systems for self-directed learning [6] where, for example, chatbots are used for quizzes. Many mobile apps may have a (self-)reward system for students. Memories motivate to repeat learning contents. Thanks to push notifications mutual feedback from fellow students and lecturers is possible in real time.

B. Inverted Classrooms

The ideas for the subject area "Inverting Education" (also known as "Flipped Classroom" or "Inverted Classroom") are not new. One of the first publications about this concept [7] describes the successful application at the University of Miami. Further development of technologies, in particular communication via the Internet and the widespread use of mobile devices, are constantly opening up new opportunities for learning outside of the lecture hall. Experiments with podcasts [8] and online-casts followed. Courseware [9] has been introduced worldwide. Numerous other applications have been described [10]. Basically, the "Inverted Classroom Model" consists of the following activities [11]: online content deliver, deepening of content knowledge and mastery. During these activities, it is worth mentioning that the classic frontal lecture completely disappears. The transfer of knowledge is completely based on digital media and is further supplemented by online collaboration (forums, chat, etc.). Classroom teaching is characterised by the application and deepening of already existing of learned knowledge. For this teaching approach, it is important that the students have acquired the respective knowledge before the actual class. "Mastery worksheets" help the students to determine whether they have actually acquired the necessary knowledge.

C. Gamification

Game-based learning scenarios may be another setting to support blended learning environments. According to [12] gamification is "using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems." The use of game mechanics and experience design to digital engage and motivate people to achieve their goals [13]. Game-like activities trigger emotions and these are essential for the learning success. Undeniably, games are part of our learners' world. They are fun and offer a wide range of opportunities and challenges. In order to master the games, different cognitive, social or creative skills are demanded and promoted by the players, depending on the respective game. Learning and playing are therefore always inextricably linked. Players not only get involved with the game itself, they are also willing to acquire knowledge in and for the game. Using this potential enhances teaching and learning goals at the same time.

V. METHODOLOGY

Although the teaching faculty at our institute is quite familiar with various blended learning concepts, we were interested in learning more about our students and why they

tend to engage with online activities or not. Thus, an online survey was created (surveyMonkey) which should give students more room to express their voices on their learning experiences. The link to the online survey was sent to recent graduates (2016-2018) and current students (enrolled for winter term 2018) and was available for seven days. In total, 150 out of 350 potential addressees participated. With the help of slider questions, participants could rate items or statements on numerical scale by dragging an interactive slider. The survey was conducted in German (see Appendix) and focused on several questions how students engage with Moodle and the respective activities, what they find in particular engaging and which learning scenarios should be given more room when it comes to technology. We analysed the results in form of an average rating calculation. For the publication at hand we summed up the most important responses based on the questions raised. The summary of the survey is thus based on a thematic analysis which is outlined in the next chapter.

VI. NEED FOR MORE LEARNING ENVIRONMENTS SUPPORTED BY TECHNOLOGY

Based on the survey it can be concluded that our students favour technology-supported learning environments over traditional teaching methods. This is already visible in the didactical concepts outlined in chapter 4. Although these pedagogical approaches do exist, it seems that they hardly find their way into the classrooms and when used the concepts are slightly misunderstood and wrongly interpreted. Based on the survey, more than 40% of the participants feel that their engagement with the online platform is questionable as they miss interactive elements, reasons for being constantly engaged with the platform, and a more appealing representation of the content itself. However, nearly 24% of the participants also put forward that the online platform presents too much content which is difficult to digest and thus losing the overview of assignments and tasks overwhelms students, which finally results in less willingness to work with the platform in question. Finally, feedback is a huge concern according to the results of the survey. Students have the feeling that they rarely know how much progress they have made so far and how well they performed when being asked to complete certain assignments. Another important element missing is collaboration and the preference for real time communication and a more comfortable learning environment. From the findings of the survey it can be concluded that, Moodle, which is apart from the teacher an additional content provider, need to display more interactive elements as students feel more likely to engage with the presented content then. These interactive elements can include gamified elements, ideas for mobile learning [14] but also flipped classroom approaches (see chapter IV). In order to counteract, the overall dissatisfaction with the platform, three major ideas should be considered for future discussion on digital learners.

A. Social Communities and Collaboration

The establishment of virtual classrooms [15] may foster online collaboration and thus promote learning success.

Tools such as Codepad from Hazel or Etherpad are supporting the simultaneous and joint work of students and teachers (see for example [16]). Massive Open Online Courses (MOOCs) [17] do represent a new way of engaging with course content.

B. Real Time

Relevant information is provided in real time. Push-notifications without annoying log-in and queries provide information automatically. This information could include direct feedback (i.e. grades or verbal assessment) on assignments or activities but also news on newly-created assignments and other important changes made on Moodle.

C. Study Environment

In addition to the classic consummation of content (pdf documents, screencasts and videos), active components such as mobile simulations, quizzes, learning games and other types of training have to be integrated into blended learning courses to make content more accessible for students.

VII. CONCLUSION

Undeniably, the future of learning takes place outside the traditional classrooms. Universities have to make sure that they are able to cope with this challenges which will not only affect curricula designs but also teaching methods and the approach towards technology. According to [14] managing your study life on a smartphone is already part of our future. The constant development of the smartphone and emerging technologies such as the Internet of Things (IoT) are constantly opening up new avenues to explore in order to create a sustainable way for the success of learning and teaching.

APPENDIX

Questions (surveyMonkey)

1. Ich arbeite mit Moodle jeden Tag.
2. Ich schaue mir die Lehrinhalte und neue Aktivitäten regelmäßig über die Plattform an.
3. Die Inhalte der einzelnen Lehrveranstaltungen sind auf Moodle sehr gut konzipiert und übersichtlich.
4. Ich weiß immer was wann und wo zu tun ist.
5. Für mich stellt Moodle eine reine Informationsquelle da.
6. Die Informationsaufbereitung auf Moodle überfordert mich.
7. Die Uploads und Downloads von Handouts aus verschiedenen Lehrveranstaltungen sind mühsam. Man verliert schnell den Überblick.
8. Ich finde die Präsentation der Inhalte interessant.
9. Ich fühle mich motiviert mich mit den Inhalten auf Moodle auseinanderzusetzen.
10. Ich würde mir mehr interaktive Aktivität auf Moodle wünschen (z.B.: Forum Einträge, Peer Feedback, interaktive Lektionen).
11. Ich finde Ansätze wie Level up, Completion Process, und das Sammeln von Badges motivierend mich mit den Lerninhalten auseinanderzusetzen.
12. Der Einbeziehung von weiteren Technologien (Lernapps, podcasts, etc.) motivieren mich sich mit den Lerninhalten intensiver auseinanderzusetzen.

13. Ich habe oft das Gefühl, dass ich mit Moodle alleine arbeite.
14. Das Konzept des „Inverted Classrooms“ motiviert mich sehr mich außerhalb der Lehrveranstaltung mit den Lehrinhalten zu beschäftigen.
15. Die Zusammenarbeit mit anderen Studierenden ist auf Moodle nicht möglich.
16. Das Feedback von Lehrenden ist zu wenig vorhanden.
17. Das Feedback von Lehrenden deckt sich oft nicht mit Abgaben und abgeschlossenen Aktivitäten.
18. Ich schätze es wenn Lehrende neue Technologien für den Unterricht verwenden.
19. Ich würde es begrüßen, wenn es mehr technologie-basierende Wissensvermittlung geben würde.
20. Die Einführung einer sogenannten Study App wäre sinnvoll, da man dann sämtliche Aktivitäten von Moodle auf einen Blick hätte.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

The online survey was conducted by all authors; this paper was collaboratively written and all authors had approved the final version.

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