Gamification: An innovative approach to enhance learning skills of students

Kanika Sharma*, Rajni

School of Computer Science & Engineering
Lovely Professional University, Phagwara

Abstract: Educational methods currently used are very broad and include academic teaching, practical training, discussion, directed research, and multimedia-based learning. Technology has taken its toll on the educational scene like never before. Indeed, today's K-12 students have been controversially called digital natives, having been born in the digital era and almost exclusively using technology in their day to day life activities. Moreover, adults and professionals are also adapting to technology and increasing their reliance on it in their day-to-day operations, owing to its omnipresence with the smartphones, tablets, computers, and the internet. These observations suggest a strong influence of technology on all aspects of society. This paper presents the importance of gamification to enhance the learning skills of the students.

Keywords: Education, digital native, gamified learning, technology.

1. Introduction

Imparting learning as disciplined, formal education is a fairly modern invention, only a few centuries old. While it may be efficient, it is often boring, or stressful, or irrelevant, or all of the above. This is because formal education has degenerated into passive consumption of knowledge and its later regurgitation in tests of recall. Whereas, research shows that deep learning happens when a learner is self-motivated to learn and constructs own understanding of knowledge.

This is what happens when we are playing a game. We are intrinsically motivated and overcome difficult challenges of our own volition. Games are high on effectiveness and engagement and they cultivate self-awareness, self-control, attention, effort, persistence, rule following, boundary negotiation, bonding, trust, empathy, respect, fairness and making right choices. But talk about using games in education and you have parents complaining how games are addictive and colossal time-wasters and educationists lamenting that games foster adverse social behaviour, at times resulting in outright violence.

Gamification is use of game-elements in non-gaming contexts. Nike creating an online community where customers share their exercise data with friends and use friendly competitiveness to improve fitness.

Gamification of learning is not simply adding points, badges and leader boards as a layer on top of a learning activity. It involves deconstructing good games to find elements that can be used to enhance learning. According to designer Sebastian Deterring, a good game connects with the personal goals and passions of the players and a great game lets the players customize the goals.
The key take-away from gamification for learners is the understanding that something becomes fun and intrinsically motivating when it is relevant to own context. So, learn to restructure learning activities such that they are better aligned with your own aspirations. For example, you may think that there is no point studying quadratic equations or Calculus because you will never apply them in your daily life. Change this mindset and instead think of them as a learning experience that helps you figure out how to learn difficult and complex concepts, which is a very useful life skill. Thus, for us to pay attention to something for any amount of time, the image must be varied. For example, we usually have no difficulty in paying attention to play because in play novelty is inherent – every minute of a tennis match is different. The trick to improving attention lies in our ability to vary the target of our attention.

We need to figure out ways of looking for novelty in a stimulus that otherwise seems static, say a teacher talking in the class or when we are reading a long research paper. By creating novelty in a stimulus, we make it more interesting and hence do not get distracted. Teach your kids how they can make learning an adventure or a game, for example, by reading a story from the perspective of different characters in the story, or making up different endings to the story. Such mental interaction makes the stimulus (learning content) novel and hence diminishes distractions.

Analysing the design of great games provides an insight into self-motivation – how games can make players toil and persevere. In his book ‘Drive – Surprising Truth About What Motivates Us’, author Daniel Pink explains that motivation 1.0 was based on our biological drive of survival and growth, motivation 2.0 is based on ‘carrot and stick’ approach, but we are now moving towards motivation 3.0, that Pink describes as AMP – Autonomy, Mastery and Purpose. Autonomy: the urge to direct our own lives, Mastery: the desire to get better and better on something that matters, and Purpose: a yearning to do something larger than our self-interest. Knowledge workers can learn from games that beyond material rewards, a key motivator we have is our innate desire to excel, and use this understanding to become excellent lifelong learners, who yearn to learn.

Game elements such as immediate feedback and earning badges for completing the challenges successfully are strongly influential on increasing the students’ drive in engaging in these games even within the walls of a classroom. Additionally, the social component of gamified learning, whereby students gamify in groups, leads to loads of benefits on the brain function. Indeed, social, intellectual engagement activates neurotransmission in the brain, brain plasticity, and rewiring, and mitigates brain inflammation and the deleterious effects of oxidative stress on the brain. The beneficial effects of social interactions have been interestingly highlighted in delaying dementia in the elderly population.

It is well established that games, whereby a person wins or receives positive feedback, can activate the brain’s pleasure circuits by inducing the release of the neurotransmitter dopamine.
Educational games are suggested to have the same influence given their elements of winning challenges or successfully achieving a goal. This pleasure during gamified education results thus in a long-lasting affinity for the academic subject or for solving otherwise complex problems.

Furthermore, the influence of games on the pleasure centre has important effects on learning per se. Indeed, reward-related signals have been reported to promote the storage of new information into long-term memory through dopaminergic modulation of the midbrain, which activates the hippocampus, a structure primarily involved in learning and memory. Dopamine is also involved in controlling neuronal plasticity within the hippocampus, which is a significant brain phenomenon underlying the acquisition of new information and skills. Moreover, hippocampal memory has been reported to improve following the practice of video games in adults through the stimulation of the brain circuits.

2. Literature review

The authors have developed a gaming model “Learn programming with fun”. It is a web-based platform which helps in enhancing the student motivation towards the studies. There are different level sets to test the learning skills of the students [1]. The authors have used quiz-based approach to test the student learning skills [2].

The authors have explained that the teaching offered in the schools lacks in the excitement factors. This is because in a school environment the conditions are not optimal because unlike a game the challenges provided are not novel or interesting (interesting challenges are contextual and learners identify with them because they are based on learners’ aspirations, or life situation), there is no varying of pace in learning, scaffolding that allows gradual learning may not be present and learners at school do not get ‘excessive positive feedback’ which is informational in nature and not controlling or judgmental [3].

The authors have explained that in a game a ‘newbie’ needs to be ‘onboarded’, a ‘regular’ needs fresh challenges so that new learned behaviours become a habit and an ‘enthusiast’ plays the game for achieving ‘mastery’. One size does not fit all – an important lesson for formal education. Kim further propounds that good games embody the same five elements that are imperative for wellbeing and happiness, as suggested by father of positive psychology Martin Seligman – the PERMA elements: Positive Emotions, Engagement, Relationships, Meaning and Accomplishment. Elements that would surely go a long way in enriching a learning experience [4].

The author Daniel Goleman explains the impact of emotions on learning and performance. He explains that our cognitive performance is highest at the right level of stress, and inspired moments of learning combine – full attention, enthusiastic interest and positive emotional intensity. Hans Selye too observed that an optimal amount of stress is important for improved performance. He described it as ‘eustress’ or euphoric stress, which is the opposite of distress. Psychologist Mihaly Csikszentmihalyi describes a similar mental state, which he calls ‘flow’, where one strikes optimal balance between skill possessed and challenge faced [5].

The author explained that the game designers understand this optimal skill-challenge balance very well. That is why they build ‘levels’ in a game. If experience or knowledge is low and challenge is high it leads to anxiety, so games provide scaffolding like hints; if knowledge is high and challenge is low it leads to boredom, and to beat boredom games allow the players to
quickly get to the next level of challenge. Great lessons here for differentiating learning to suit individual learner needs. Such personalization of learning is becoming more and more doable, as described in detail in Clayton Christensen’s book, ‘Disrupting Class’ [6].

The authors have illustrated many examples of how he has used ARG (Alternate Reality Games) in his classroom. He also incorporates other game mechanics. For example, one of the first things he did was to tell the students that in his class they all start at Grade-F (or Score = 0, as in a game) and that they have to work their way to higher grades. They earn Experience Points for what they do in the class, including one point for simply showing up and work their way to better score/grades, akin to moving to higher levels in a game. ‘World Without Oil’ is an example of an ARG to solve real-world problem by chronicling alternate future scenarios [7].

Conclusion

In summary, by deconstructing good games we can identify elements that can be used to augment learning. A good game constitutes a challenge that players have an intrinsic motivation to undertake and master, it has innovative and constantly changing stimulus that ensures intense engagement, it allows autonomous choices while incorporating a rule system that ensures fair play and clear winning conditions, it has instant, juicy and informative, non-judgmental feedback that improves performance, it provides a safe but not sterile place where consequences are not dire, frustration is taken in stride, failure is less shameful and in collaboration there is mutual respect, trust, benevolence and empathy. Surely these are ingredients that can be borrowed for enhancing any learning experience – be it formal education or an app.

References


[2] ParulKhurana, Balraj Kumar. "GAMIFICATION IN EDUCATION-LEARN COMPUTER PROGRAMMING WITH FUN."


