Creating ambassadors of planet Earth: Where virtual reality, serious gaming and artificial intelligence meet education

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The International Space Station (ISS) orbits the earth approximately 16 times per day. European Space Agency (ESA) astronaut André Kuipers, who spent a total of 204 days in space in two missions, often claims the International Space Station (ISS) deserves the Peace Nobel Prize. Indeed, there are very few if any examples where so many countries work so closely together towards the same shared goal, exploring our frontiers. But I think there is another reason the International Space Station (ISS) deserves a prize. I do not know one example where knowledge institutions, industry, governments, governmental organizations, and citizens across the world work so closely together aiming for the same goals, to create a better, healthier and safer world.

When considering the United Nations sustainable development goals, I see overlap with the aims of the International Space Station: no poverty, zero hunger, good health and well-being, gender equality, climate action, life below water, life on land, … A better world with no borders and no boundaries. One of the 17 goals probably brings them all together: quality of education. By educating children across the world, we can indeed make the world a better place. By educating curious minds, all 17 goals may be achieved.

But how to educate curious minds? Today's education faces challenges. What are the 21st century skills we need to teach our younger generation? What will the digital era look like for the younger generation? How can we accommodate the individual differences between learners? How can we reach children across the world with the same high quality of education?

Spacebuzz explores answers to these questions. SpaceBuzz is a non-profit organization that has built an educational virtual reality project developed to offer school children an immersive astronautical experience. In a pre-flight program in school children are trained to become astronauts. After they pass the training, an actual rocket ship arrives in front of their school for a (virtual) rocket launch. Through advanced virtual reality the Spacebuzz rocket ship allows its crew to experience the so-called 'overview effect', a cognitive shift in awareness of the fragility of planet Earth reported by astronauts during spaceflight. An experience of a world with no borders and no boundaries. After returning back to earth, a postflight program in schools lets children share their astronautical experience with friends and family.

The success of SpaceBuzz in the Netherlands, with hundreds of schools already signed up for the virtual reality space mission, is one initial step. SpaceBuzz was always supposed to become an international project, as it has been our mission to turn all children into ambassadors for planet Earth. With a SpaceBuzz rocket ship visit to Houston Space Center the world's astronauts were able to experience a virtual version of what they had experienced themselves. With a presence in Washington at the International Astronautical Congress over 2000 visitors from countries all over the world experienced SpaceBuzz.

The 15ft SpaceBuzz rocket ship and educational program have been entirely financed through private funding and donations. The free program, featuring classroom materials in a pre- and post-flight astronaut training as well as the virtual reality mission can be adopted as a tool to engage with children in their own respective countries. The program can be adapted with the virtual presence of a nation's own national hero, using techniques in virtual reality and artificial intelligence.

In the meantime, academic research has shown the first findings of the effectiveness of the overview effect in combination with the learning gains in hundreds of elementary school children. Not only does the virtual reality experience seem to yield an experience of awe and compassion – resulting in the overview effect – but children also demonstrate learning gains as a consequence of this experience. SpaceBuzz is thus able to create a learning environment for children in which they learn without realizing that they learn.

Let's ask ourselves the following question: Imagine there were no educational system. There were no schools, no classes, no subjects and disciplines, no testing. All there was, was millions of children across the world that needed to be prepared for the future. And there were technologies, such as virtual reality, serious games, intelligent tutoring systems, 5G networks, data science and artificial intelligence. We were asked to build an educational system from scratch. The technologies we already have, the end users we already have. If you can promise that the educational system we were to build together is identical to the educational system we have now, nothing should change. If, however, the educational system we build from scratch for the future is even slightly different from the system we currently have in place, we owe it to our younger generation to rethink, and rethink hard.

Creating ambassadors of planet Earth, teaching children worldwide, seems to be ambitious. However, reaching children worldwide and preparing a younger generation for the future does not have to wait for innovations in hardware. It's all there. Virtual reality headsets are affordable, and smart phones can be proxies, 5G networks can send data from and to users seamlessly, and cloud computing allows for extensive computer use. We do not have to wait for the software either. Serious games, intelligent tutoring systems, learning analytics algorithms, are all readily available. The main challenge may lie in the organizational structure. How can we bring academia, knowledge institutions, industry, governments, governmental organizations, and citizens together? How can we team up the gaming industry, software companies, educators, policy makers, science museums, media companies, teachers, schools, and academia worldwide? How can we together build a better world with no borders and no boundaries?

We already have one example that the organizational challenge is no reason for delay, in the initiative where no boundaries exist, technological or otherwise, the initiative where ambassadors of planet Earth orbit our blue marble approximately 16 times per day.