LevelUp: A courseware platform where students can interactively engage with different types of technology through visual project-based studies

The platform hosts a variety of different types of project that young students can choose from individually. It is made to encourage them to endeavor in technical fields with projects connected to topics that inspire and motivate them, providing them with hands-on tools to create something they are passionate about. LevelUp will make the learning experience not only more accessible and interesting, but also highly engaging and rewarding for all students, regardless of their gender and background.

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Children and teenagers today were born into a world that relies heavily on digital technologies and is extremely passionate about them. However, there is still an imbalance regarding those who go on to pursue careers in STEM fields and those who don't, and it is largely based on gender. While society certainly still needs to make significant changes to help tackle this issue, education can do a vital part as well.

Studies have shown that especially girls are often intimidated to thrive in technology-based classes when boys are present. But instead of separating the genders, the platform allows for autonomous, location-independent studying. The students can access the platform from any online device, such as a laptop, from wherever they choose and take as much time as they need to complete a lesson. Each student will be given an individual ID number and set up their profile using an avatar and alias, in order to hide their identity and gender until the completion of the project to avoid gender bias during grading.

Through a chat system, students can, where necessary, have direct exchanges with a teacher who specializes in the field their respective project is in.

Teachers teach via pre-recorded video tutorials, providing any kind of virtual material necessary for the student to download right below the video. Each project is divided into lessons that cover the next step in the process. There are milestones where students will upload something to represent their current progress to the platform, which will be reviewed by the teachers and unlock the next level and videos.

Each project will engage the students with different aspects of a variety of technological skills. The students can choose freely which projects to enroll in, depending on their personal interests. All projects will be graded equally.

Project examples:

Digital Architect: Students learn how to create a 3D model of whatever they like. From designing a piece of jewelry, to a room concept, or an entire skate park, the possibilities are almost endless. In the process, they learn to use CAD, 3D software, and basic graphic design skills. They will also learn about different types of material that can be used for 3D modelling, and their respective environmental impact. Upon completion of the project, the students 3D print their model for them to keep.

- ➔ Students learn how to use 3D software (Maya/Cinema4D/Lightwave 3D/Blender 2.8/ZBrush/SolidEdge/SolidWorks…) to plan and execute a project, as well as how to program and operate a 3D printer.

The Influencer Workshop: Teenagers are both fascinated and inspired by so-called influencers and bloggers on social media. In this project, they will learn how to safely set up their own influencer presence. It starts with building a website, which they will learn to develop themselves, including creating matching graphic designs. Advanced stages of the course teach students how to use their phones to take photos and videos, and later edit them with professional photo and video editing software.

- ➔ Students learn PHP and MySQL, as well as how to use graphic design, photo and video editing software (Adobe Illustrator/Photoshop /After Effects). Moreover, they'll learn about online safety issues, data regulations, and privacy.

Fashion Guru: Students will learn how to create an app that can scan a piece of clothing and then make suggestions on what to pair it with, based on what's in their closet. They will learn how to run machine learning algorithms to analyze the data for the app to operate. Within the app, students can rate how they liked a certain outfit that the app suggested. They can also receive statistics about how often they have worn a piece of clothing and how well it has been rated to determine what they like best. There will be an option to share the photos of their outfits with their friends who are using the same app, unlocking features such as swapping clothes with each other in real life to help further the idea of sharing clothing rather than buying new things all the time.

- ➔ Students will learn machine learning, Python coding, the basics of linear algebra and statistics, data collection, analysis and visualization, as well as app development.

Robotics Engineer: Students will receive an Arduino kit to take home and decide between several types of robots they can build, all with practical use that benefit the environment. Based on their choices, they will go on to research the sensors of their respective robot and write a fitting code to activate it. This can, for example, be a weather station, where students will use luminosity, temperature and barometric pressure sensors and print the output data into an excel sheet to then visualize the changes over time.

- ➔ Students will learn the basics of robotics, programming, data mining, visualization and sensors with a focus on environmental issues.

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