

PEDAGOGICAL DOCUMENT TO YOUR 3D SCHOOL



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From teacher centered teaching to student centered learning

The world has changed, learning has changed and the expectations for the learner has changed.

A traditional school or community centre is the student's local learning environment. An electronic learning environment, on the other hand, is global, worldwide. Friends can remain the same as in the local environment, but now the user is also given an access to a world of peer learners, outside school experts and the endless possibilities they provide. The benefit of the virtual world is that unlike in a traditional learning environment, it is not restricted to the classroom walls. Technical implementations and use of this particular platform are limited only by imagination.

OLD WAY TO LEARN (teacher centered)

- Teacher talks while students are listening.
- Students are passive while listening.
- Teacher asks questions and students answer.
- Students perform individual tasks.
- Students are taking tests.

NEW WAY TO LEARN (student centered)

- Students are active while learning.
- Students search for information.
- Students make inquiries.
- Students work in teams and collaborate with the outside world.
- Students share their materials with others.
- Students skills are more as goals rather than the learning content.
- Students show their competences in projects.

The FVS 3 D environment supports new pedagogy and provides students and teachers more opportunities for active and more individualised learning.

FVS supports competence based curricula.

PEDAGOGICAL APPROACHES

You may use the 3D environment for various pedagogical approaches and methods. Here are some explained:

Project-based learning

is a teaching method in which students learn by actively engaging in real-world and personally meaningful projects.

Students work on a project over an extended period of time – from a week up to a semester – that engages them in solving a real-world problem or answering a complex question.

In the FVS 3D platform you may design projects, where student teams interact and create and store their project materials: links, texts, videos, pictures.

Problem-based learning

is a student-centered pedagogy in which students learn about a subject through the experience of solving an open-ended problem found in trigger material.

In problem based learning students use “triggers” from the problem case or scenario to define their own learning objectives. Subsequently they do independent and self-directed study before returning to the group to discuss and refine their acquired knowledge. Here the learner uses appropriate problems to increase knowledge and understanding. The process is clearly defined, and the several variations that exist all follow a similar series of steps.

In the FVS 3D platform you can create learning paths, where there are problems to be solved either by individual students or teams.



PEDAGOGICAL APPROACHES

Phenomenon based learning

is a learner-centred, multidisciplinary instructional approach based on student inquiry and real-world phenomena. The students examine the real and current phenomena of the society. Learners investigate and solve their own questions by applying those disciplinary subjects are relevant to the problem.

Phenomenon based learning requires the learner to be active, in collaboration with others. The learners seek for transdisciplinary answers to real-world phenomena. They can utilise outside school experts in their inquiries, and share their information with each other. Their inquiries or experimentations, ie the process, is more important the output. In Phenomenon based learning the students learn transversal skills like critical thinking, collaboration, and communication,

In the FVS 3D platform the students may interact with each other and with out-of-school experts, search for information, make inquiries as well as store and share their collected data on any phenomena.

Gamified learning

is an educational approach to motivate students to learn by using video game design and game elements in learning environments. Gamified instruction uses the mechanics, engines, and underpinning strategies games use to encourage play to encourage learning. It is to leverage the mindset and the unique power of games to sustain interest and build commitment.

Gamified instruction empowers students to own their learning. Students who learn in a gamified classroom have a better capacity for persistence. Self-direction is obligatory in a gamified classroom and is developed by all games. Gamified instruction develops social skills. It also encourages students to build self-directed learning communities.

The FVS 3D platform provides possibilities for playfulness and possibility of creating a 3D gamified learning journey.



PEDAGOGICAL APPROACHES

Playful learning

is when children develop their imagination and physical, cognitive and emotional strengths. Learning through play requires the process or experience to be fun, which can increase student engagement.

Play often involves the breaking or blurring of boundaries. Play occupies a realm outside of everyday events. Playful learning means to imagine, as well as trial and error action. Anything is possible! In playful learning the process is more important than the outcome.

The FVS 3D platform provides sense of fun and playfulness, as only the imagination is the limit.

Design pedagogy

is when students learn to wonder and innovate designs of tools, materials, built environment and services. Design pedagogy develops environmental literacy skills and utilizes the design process. Design learning provides, by doing and experimenting, ways of learning as well as tools for developing ideas for all learning.

Design pedagogy encourages independent and bold thinking, the exchange of ideas and the utilization of mistakes, it also strongly develops teamwork and expression skills. Design pedagogy inspires the learner, facilitator and teacher to experiment, take initiative, exchange perspectives and share their own ideas.

The FVS 3D platform is a great way to learn to design new and play around in 3D environments.





FVS 3 D platform will provide students following opportunities:

1. to communicate through several different channels using communication tools (chat, voice, video and share screen)
2. to be creative, designing 3D spaces
3. to use different tools to simulate both real-life objects and locations
4. to collaborate in a group in easier and more engaging way
5. to become more independent
6. to gain more ownership of their learning, not a mere listener, but an active learner
7. to take advantage of innovative technology: the use of a three-dimensional and multi-user environments
8. to use information from various sources, including cloud storage
9. to think critically
10. to memorize better as hand-eye coordination and visualization of learning

Students gain following transversal skills

- **collaboration and teamwork:**
students create avatars and collaborate with others in different projects.
- **communication:**
students communicate with others via multiple channels (chat, video, screen share).
- **creativity:**
students create avatars, design and furnish their rooms using their imagination.
- **critical thinking and curiosity:**
students learn how to think in a structured and a critical way.
- **digital skills:**
students learn how to create and learn in 3D environment and use digital tools.
- **enhancing empathy:**
students create avatars and collaborate with others. They have avatars connecting with others in real time.
- **enhancing memorization:**
students connect a presentation to a 3D location and objects enhances visualization and memorization.



How to use?

The advanced technical solutions enable users to assume roles through which each topic can be studied in a game-like manner. The teacher and the user can build a plot script through which learning takes place.

Individual learning where the user's access to the materials that are readily available in the platform or where the student creates and upkeeps an individual 3D learning space, like a portfolio.

There are many options for this: e.g. the teacher/student can create a ready 3D environment and a learning package OR that school/ teacher can purchase a ready-made environment from FVS to utilize for student learning.

Facilitated learning where the teachers can conduct online lectures and exhibit and share the presentation with PDF, videos and live lectures, using chat and video functions to communicate. Teachers can use Google tool functions imbedded within the platform. Here there can be one single 3D environment or many.

Team learning where the students or users can collaborate with each other by doing group work. They can share information, documents, links, they can chat and share video. They can virtually tap on each other's shoulders, have individual or group discussions.



How to start?

Teachers:

- create a learning base in the platform in accordance with the new curriculum. Platform is pedagogically suitable for all curricula.
- create a desired virtual room from the ready-made base (with students).
- furnish a virtual room (with students).
- link and bring teaching material related to the project in pictures to the base.
- share link for the students.
- distribute the facilities to the students.
- will guide students through the learning journey.

Students:

- need a computer with Chrome browser. Students use the 3D platform without VR glasses.
- join via link.
- can sign in to the platform with their own personal Google IDs.
- design and decorate their rooms by themselves or with teacher.
- create their own Avatar character on the platform.



How to create an avatar?

The users are represented by realistic and customisable avatars. The avatars are used to interact as a part of a virtual team or peers.

There is a primary default avatar that you can edit.

how to edit your avatar:

Go to tools - avatar editor

You can edit:

- gender
- child or adult
- body tone
- eye colour
- hair style and colour,
- shirt style and colour
- pants
- shoes.



Your avatar is able to act, communicate and collaborate with other avatars (students and teacher) in real-time.

NOTE: A survey we have conducted, indicated, that being able to modify the avatar and to choose a name for it is important to the students.

How to move in the 3D environment?

Basic movement

You can move avatar around the virtual space by using the WASD keys or the arrow keys.

Moving to a specific place in the 3D environment

You can also move the avatar to a specific spot in the virtual space by double-clicking with the left mouse button. If there is no object between the avatar and the spot, the avatar will walk directly. This way the avatar can also sit down on a chair.

Jumping and flying

Avatar will jump when you press the spacebar. Avatar will fly when you press the F key. When you press the spacebar while avatar is flying, it will go up. When you press the C key, avatar will come down. Avatar will land on the ground and end flight mode when you press the C key.

Movement from one space to another is done by teleporting, either with the map and location tool or from the personal teleporting platform.



PEDAGOGICAL USE OF AVATAR

The Character (avatar) is seen in the third person. The students have recounted: “Make him stand”; “He doesn’t want to stand”; “Why won’t he?” Modifying the avatar is considered a fun activity. The children can modify themselves or a character representing them.

Non-verbal gestures are clearly important to pupils. Flying is seen an amazing feature: “Wow!”; “Go flying!” Questionings and patterns of usage also indicate that the pupils wish the character could move in a more human fashion: by running, taking the stairs, swimming or riding. Currently the avatar can walk, sit down, jump and fly. Your avatar is able to act, communicate and collaborate with other avatars (students and teacher) in real-time.

A personal avatar allows easier and more uninhibited expression. In some situations it may be good to be able to take on different roles or to hide one’s username but the rest of the users should be made aware of this. In a virtual environment, no one needs to work alone, but feedback from one’s peers is always available.

Students also learn how to work in an ethical way in the internet while using FVS.

The teaching and discussion of internet ethics is a good lesson plan.



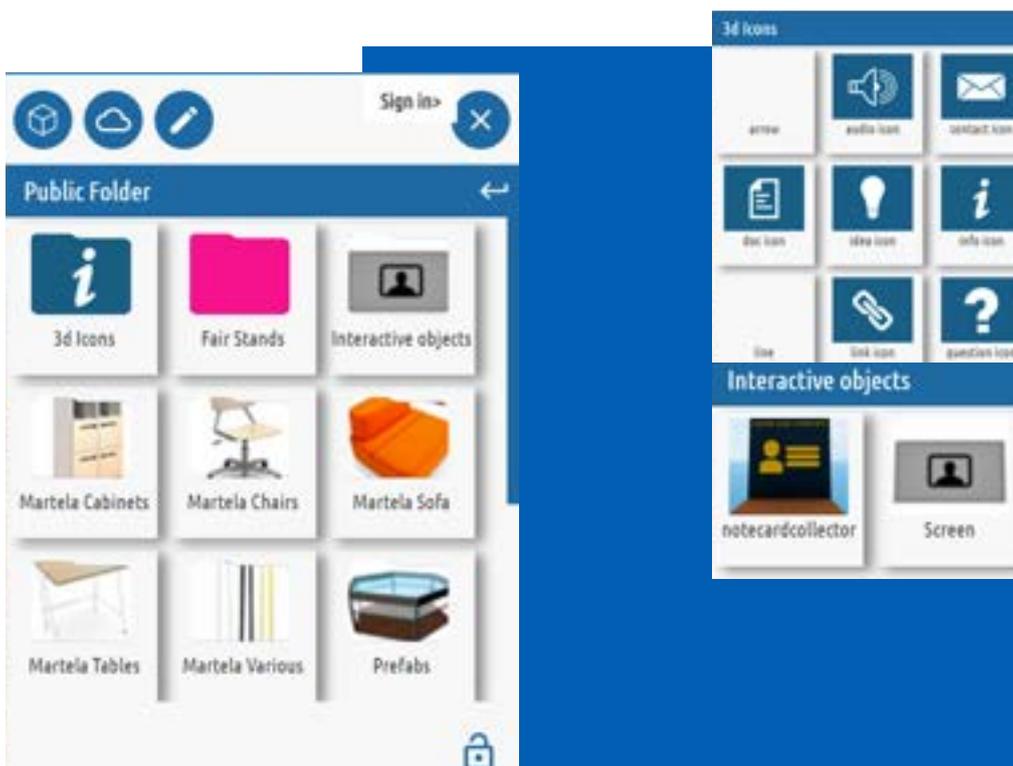
Create a 3D space

Only your imagination is the limit!

Sessions can be started with a blank slate (tabula rasa) or a scenario completed during the previous lesson. The students can save the different stages as the work progresses. They can compile information and create presentations. They can retrieve information on the topic and use that to build a presentation, which can be a link, image, test, sound, simulation or mobile observation. It is also possible to build information together

- You can create any kind of learning space, a playground or a classroom.
- Start from an empty canvas - and create your dream learning space.
- Optional to also use readymade learning spaces.

There is a selection of **Martela** furniture: chairs, tables, cabinets, sofas and other items.



Communication inside the 3D space

Excellent tools for social communication and project work!

1) Communication tools

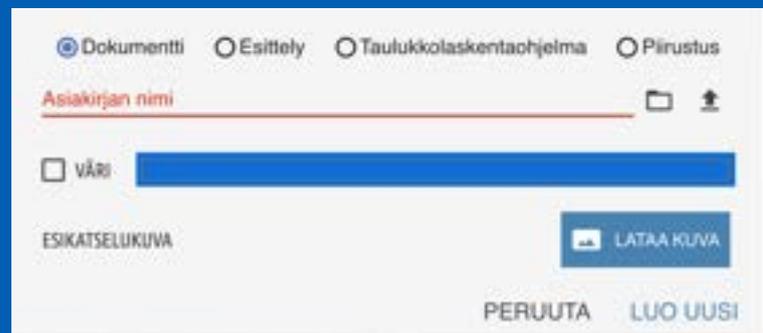
-real-time chat, voice, video and screen sharing. You can turn on your camera and microphone or use chat function to communicate with other users.

2) Project working tools

-Create new and shared documents using Google Docs and Spreadsheet.

3) Presentation tools

-Share presentations, videos, photos, and other materials as links online, you can share directly from your Google Drive.



A screenshot of a document creation form in Finnish. At the top, there are four radio buttons: 'Dokumentti' (selected), 'Esittely', 'Taulukkolaskentaohjelma', and 'Pöytäkirja'. Below this is a text input field labeled 'Asiakirjan nimi' with a folder icon and an upload icon to its right. Underneath is a checkbox labeled 'väri' followed by a blue horizontal bar. Below that is a text input field labeled 'ESIKATSELUKUVA'. To the right of this field is a blue button labeled 'LATAA KILVA'. At the bottom right, there are two buttons: 'PERUUTA' and 'LUO UUSI'.

Send public message



Group and project work in FVS

FVS is an excellent platform for group work and for projects.

Students learn to collaborate and teamwork skills.

Students can share documents, photos and videos in virtual environment.

The platform offers an excellent tools for communication. Students can also chat and have a call with or without video to other students in real time. The student group may also be scattered globally, so project and team work who are not physically near each other can utilize the platform with ease.

Students and teacher can design their own personal spaces. Sometimes also an own virtual classroom can be the most important place because students move through the classroom in 3D environment via links.

The platform can help to learn how to divide into groups.

Projects can be made into gamified learning process.



Case, City of Espoo, 5th graders

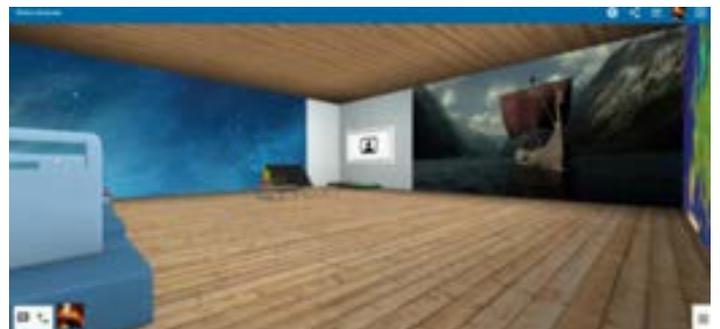
5th graders from Espoo were using FVS for their project about Vikings. The project was utilising phenomenon-based approach.

Students learned to use the virtual environment together with teacher and understand its possibilities for learning.

Teachers told that they learned new way to realize a teaching and learning.

Teacher told that the new curriculum demands for the importance of diverse learning environments, similar to these gaming and virtual environments. The learning environment should be safe and inspiring to learn.

When using platform for history or other projects, students can also build a timeline in the platform. Simulation about timelines or years is representing different centuries. The user defines the timeline for the events and collects related information and other source material. Similarly one can gather information about e.g. Napoleon and his life.



User experiences

"Useful technology for learning at school and possibilities to do group and teamwork."

"FVS is a visual and a particularly inspiring interface for many cloud services products".

Case, STEAM

STEAM education

The web-based Virtual 3D STE(A)M Laboratory (aka Virtual Lab).

The FVS learning environment enables teachers and learning content developers to collaborate and share across the borders the different STEM subjects. The 3D platform makes it possible to analyze and experience natural phenomena as they are: as fascinating objects for learning, for hobbies, and for professional careers for the future.

Teacher in the case study told that he taught the work safety issues in the virtual lab. He had already taught them in the physical lab but the Virtual Space made it possible to create an incident training in the virtual lab. Teaching working safety in the real lab is dangerous and therefore difficult or impossible. In FVS 3 D environment the students can create their own exercises to virtually practice for example how to extinguish a fire or handle chemicals safely.

There can be separate objects or scenarios built in the 3 D platform. The environment can, for example, house a virtual 3D scale model and information package of the solar system, planets and Saturn.

The space can be modified and divided according to the group and its needs by, for instance, creating small assembly areas for group work situations. You can also for example build a volcano in the virtual environment and get to know what is inside of a volcano.



User experiences

"I use Virtual Lab on my biology lessons to teach about water circulation in nature."

"The Virtual lab opens totally new possibilities for teaching."

"I was amazed to see how focused and motivated the kids are during lessons!"

Case, Vocational Education

Case: Diakonia College of Finland in Helsinki.

Virtual Space was made to provide students becoming school assistants or afternoon club facilitators to show their competence of learning.

The FVS 3 D environments includes a showcase, meeting room, and 4 different separate rooms for evaluation of the competences.

Teacher evaluated how students practiced their occupation and how the growth and development was supported and instructed. Teacher was evaluating also how students instructed special need students.

The FVS 3 D environment was built for stages to prove student competence:

- preparing for the screening of competence
- receiving the student's plan
- gathering evidence evaluation material
- participation in the evaluation discussion and evaluation meeting
- evaluation decision



Case, Language teaching scenario

Case: Pupils in the elementary school language club used the platform twice as a virtual school.

As part of the language learning process, each user created a picture in the 3D environment and came up with words based on the picture, and the other students then had the opportunity to invent more words. The platform was used in a gamified way. The students were awarded points for each word, and if one student came up with more words than the others put together, he or she was named the winner and a real wordsmith. In the next phase, the words constituted a basis for writing as many sentences as possible.

The Pig (the lobby ghost) proved to be a likeable and possibly the most popular character. Students recounted it as “A cute pig”; “Lovely”; “It’s a lobby ghost, it tells you things”; “Go to that pig”; “Say hi to it”; “Ride it”.



Special Education

Individual learning paths

The 3D environment provides individual learning paths and is therefore suitable for special education.

Teachers can create special education students their own rooms and tasks in the 3D environment.

The 3D environment can assist some special education students more as they are allowed to proceed on their own pace.

Assisting memorization

Since students can connect a presentation to a 3D location and objects, it therefore enhances visualization and memorization. For some students the connection of learning to visual is most important.

Learning analytics

The sophisticated learning analytics detect possible special education needs at an early phase, supporting teacher's own observations and decision making with data.



Study guidance

The FVS platform can also be used in study guidance.

The users may begin the work by considering their starting point and collecting related information. The final point can be 'me in ten years time'. One can set junctions along the road that relate to life and the choices one has to make while building up an occupational identity. Finally, when traditionally students would make a traditional poster, but this information can be now presented with more ease through links, sources and pictures inserted into the 3D learning environment. When necessary, this information can be transmitted from the virtual world into the real one and it can be printed or posted on notice boards.

At best, pupils may participate in practical training periods and use their camera phones with the mobile observation function.



Summary of technical information

- ★ FVS is a browser-based product. You can use it with Google Chrome browser. FVS can be used on a computer / laptop, tablet or a smartphone.
- ★ A stable, fast Internet connection is needed for the best experience with the product.
- ★ Users need a keyboard and a mouse to use the virtual space.
- ★ For participating in voice chat, speakers or headphones and a microphone or a headset are needed, and a web camera for participating in video meetings.
- ★ Users can get help during the session. There is a pop-up window containing a link to quick-start a guide. Pressing the link begins a tour that goes through all the functions in the virtual space and how to move around it.

