Europeana

Learning Scenario

(Teachers)

Title

A Metaverse Experience: STE(A)M in Archery Sport

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Abstract

This Learning Scenario will include a process and Metaverse experience based on different materials available in Europeana (photos and illustrations) to reflect on the concept of archery sport throughout history via STEAM. STEAM education provides deep learning for students by using Science, Technology, Art, Engineering, and Math. For this purpose, this Learning Scenario has a process covered in STEAM and it also aims at promoting the growth of students' easy and experience-based learning of traditional archery sports in Metaverse. A metaverse experience is described as an experience similar to living a real-life archery experience and it encourages the effects on learner motivation, learning participation, experience, and attitude improvement. It gives equal opportunity for learning and experience. As a result, this experience-based learning scenario makes equity, inclusive, personalized, and easily accessible learning environment with the support of innovative technologies for all.

Keywords

Metaverse, STEAM, archery sport, sustainable learning, experience-based learning, innovate learning

Table of summary

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Subject	*Experience-based Sustainable Learning in the Metaverse: STE(A)M in Archery Sport*
Topic	This scenario is connected with the new trend Metaverse and using it with the STEAM approach for cultural heritage archery sports. **History** - Archery and archery sport in history **Maths** - Mathematical information (math angles and lengths) on the bows and calculate potential energy of ropes. **Science, Technology & Engineering** - Create bow and arrow design for archery sport as digital. designing arrows on 3D modeling TinkerCad program and designing arrows on Blender program. **Art** - Culture feather colors on the arrows and bows. **Experience in Metaverse**: Archery sport in Metaverse via using VR glasses.
Age of students	16/17/18 years
Preparation time	1 hours
Teaching time	6 hours
Online teaching material	*We will use the following online resources:* • *To design arrow: https://www.tinkercad.com* • *To 3D modelling for arrow and bow: https://www.blender.org* • *Share outcomes : https://padlet.com/(virtual wall)*

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Offline teaching material	*Paper, pencil*
Europeana resources used	*The Europeana resources used are collected on this link:* *Soldier of the Archery Corps* *Archery illustration* *Bow and Arrow* *Woman Archery Sport* *International Archery Meeting*

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Integration into the curriculum

The learning scenario has an interdisciplinary approach. "A Metaverse Experience: STE(A)M in Archery Sport" will be linked to the current learning outcomes/syllabi in vocational high schools.

***History (Cultural approach)**:* First phase, students make research about archery in history. Students get information about archery from the Europeana Collection.They learn different types of an arrow and arch. They find answers these questions:

- What is the history of Archery sport in the Olimpic Games?
- What kind of arrows are the least frequently used? Why?

***Math (Creativity)**:* Second phase, students draw bow on paper. Students make drawing mathematical calculations on the bows. Also, identify important mathematical information on the bows and draw their bows on paper. They show another bow from the Europeana collection. Write one mathematical fact from the bow and identify one important mathematical piece of information on it.

***Science, Technology and Engineering (Design Thinking)**:* Third phase, students design arrow using TinkerCad Program. Students introduce, define and provide some information for designing a 3D modeling program on the TinkerCad program about the arrows. Students discuss the kinds of ropes used with bows in history. Also, students discuss the relation of the potential energy of ropes and bows using physics lesson knowledge. In addition, students make 3D modeling using Blender Program. Students build a digital bow and arrow for an archery game experience on the VR Metaverse.

***Art (Cultural approach)**:* Fourth phase, students research the colors of feathers used in arrows. Students research popular culture feather colors on the arrows and bows and they use their color and style selection on their designs.

Aim of the lesson

This STEAM learning scenario aims to give an opportunity to understand mathematical and scientific approach by using archery sport. In addition, the cultural aspects of this STEAM learning scenario are mainly Archery sport on Metaverse. Indeed, this learning scenario aims at promoting a growth students easy and experemential learning of Archery sport through the Metaverse.

Outcome of the lesson

The outcomes of the project will be:

1. Drawing their arrow and bow designs on paper and designs on TinkerCad and Blender program.
2. The final design product is going to reflect on the whole project experiences in all phases.
3. Project report whisch is inculudes students Metaverse experince thoughts and feelings

Trends

Metaverse in education, experince- based learning, project-based learning, collaborative learning, peer learning and innovate Learning

Key competences

Digital competence in Metaverse, critical thinking, design with creativity, communication, collaboration, problem-solving, multilingual competence, personal, experiential, and learning to learn competence, design thinking, cultural awareness, and expression competence.

Activities

Name of activity	Procedure	Time
Meeting	Meeting with the teachers involved in the project.	1h
First Phase History (Cultural approach)	**Part 1: Make resear about archery in history** 1) Students will watch a video about history of archery through the link below. http://meb.ai/EUEkxX Students will be asked about information regards the history of the archery. 2) Students will watch an approx. 9 minutes video to get inspirational champions like Mete Gazoz about the archery sport. http://meb.ai/J14t66 3) Students are organized in groups of 2 or 3 and they have to find information about Europeana resources about archery. 4) Students will be reminded about what is the importance of archery in war is by including an example in the powerpoint. Students will draw different types of an bow and arrow. i) What is the history of Archery sport in the Olimpic games? ii) What kind of arrows are the least frequently used? Why?	1h
Second Phase Math (Creativity)	**Part 2: Draw bows and arrows on paper** 1) Show the different types of bows on the internet. 2) Encourage students to: - To understand and interpret mathematical calculations on the bows. - To identify important mathematical information on the bows and draw their bows on paper. *Take-Home Task* - Show another bow from the Europeana collection. Write one mathematical fact from the bow and identify one important mathematical piece of information on it.	1h
***Third Phase Science, Technology & Engineering* (Innovation)**	**Part 3: Design arrow by using TinkerCad Program** 1) Learn, define and provide some information about 3D modeling program TinkerCad. 2) Research for selection of the materials used in the arrows as material engineering. Examination of the ropes that are used in the arrows. "What are the characteristic properties of ropes?" i) Discuss the kinds of ropes used with bows in history. ii) Discuss the relation of the potential energy of ropes and bows by using physics lesson knowledge. Part 4: 3D modeling for bows and arrows by using Blender Program i) Design a digital bow and arrow by using the Blender program. ii) Students will design a digital bow and arrow for an archery game experience in the Metaverse.	1h
***Fourth Phase* Art**	**Part 5: Research the colors of feathers that are used on arrows in history in different cultures.** 1) Show the different types of feathers on the internet. 2) Encourage students to: Students will research popular culture feather colors on the arrows.	30 mins

(Inspiring imagination)	Students will discuss colors for their arrows. Students will decide the design color for their bows and arrows.	
Fifth Phase *Excited experience in Metaverse* (Emotional Learning)	**Part 6: Play Archery on Metaverse** i) Students will play with their own creative bows and arrows design for archery sport in Metaverse via using VR glasses. ii) Students will share their thoughts and feelings about their Metaverse experiences with each other.	1.5 h

Assessment

Project Portfolio Evaluation	%100
Drawing on paper, designing on TinkerCad and Blender program outcomes.	40%
The final design product is going to reflect on the whole project experiences in all phases.	40%
After the Metaverse, experience writes thoughts and feelings on the project report.	20%

******************************* **AFTER IMPLEMENTATION** ********************************

Student feedback

Students helped each other in drawing and designing their bows and arrows. Then they played with the bow and arrows they designed and had a lot of fun. Students really enjoyed experiencing the sport of archery at Metaverse. They took pride in what they created, designed, and played with. They gained deep awareness of STEAM and self-confidence in STEAM.

Teacher's remarks

Metaverse is a great technology for education. So, teachers should use it for sustainable teaching of their lessons with the STEAM approach. Students can more easily and fast learn in the Metaverse which provides gain experience-based learning environment. Also, especially students meet unforgettable e-sport experiences in Metaverse. This situation facilitates permanent and innovative learning.

About the Europeana DSI-4 project

Europeana is Europe's digital platform for cultural heritage, providing free online access to over 53 million digitised items drawn from Europe's museums, archives, libraries and galleries. The Europeana DSI-4 project continues the work of the previous three Europeana Digital Service Infrastructures (DSIs). It is the fourth iteration with a proven record of accomplishment in creating access, interoperability, visibility and use of European cultural heritage in the five target markets outlined: European Citizens, Education, Research, Creative Industries and Cultural Heritage Institutions.
European Schoolnet (EUN) is the network of 32 European Ministries of Education, based in Brussels. As a not-for-profit organisation, EUN aims to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners. European Schoolnet's task in the Europeana DSI-4 project is to continue and expand the Europeana Education Community.

Annex

http://meb.ai/tCIYaA
https://padlet.com/informationworldforever/Metaverse


Arch Design


metaverse
Archery


Arrow Design