

Shkodër, Albania


DAAD 2023
Workshop

The impact of pandemic years to informatics education: review and next steps

Software as educational content: pedagogical scenarios and examples

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DAAD 2023 Workshop
The impact of pandemic years to informatics education:
review and next steps



Content

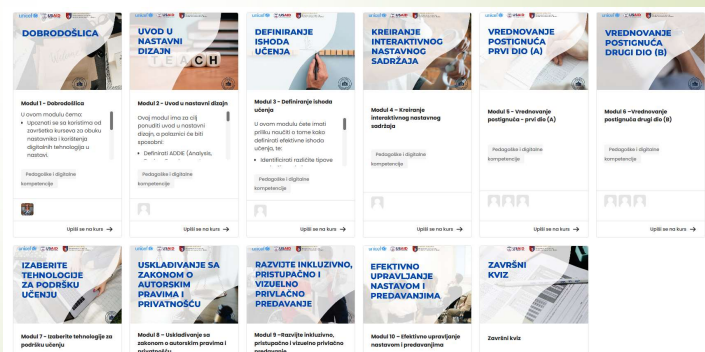
- Context and motivation for the topic
- Importance and benefits of using software/multimedia as educational content
- Classification of pedagogical scenarios for software/multimedia use
- Challenges of motivating students and planning evaluation methods

Pandemic – experience and perspectives

- ▶ Pandemic experiences: Emergent online teaching
- ▶ After-pandemic perspectives:
 - ▶ Benefits of technology aided teaching and learning
 - ▶ Blended teaching – way to facilitate and personalizing both teaching and learning
- ▶ Not all academic staff equally prepared for this change
 - ▶ Pedagogical skills should not be assumed
 - ▶ Digital pedagogical skill also should not be assumed – even for academics with technical background
- ▶ University of Sarajevo launched online platform DIGI.EDU

DIGI.EDU at University of Sarajevo

- ▶ Launched Moodle based platform <https://digiedu.unsa.ba/>
- ▶ Open for all users - self-paced including assessment
- ▶ Registration needed – certificates provided upon completion



DIGI.EDU at University of Sarajevo

- ▶ Launched **10 self-paced online courses** for pedagogical and digital competences – designed by renown expert Elizabeth Hanlis (Canada)
- ▶ Designed and delivered additional **10 in-person courses** – more hands on experience - by academic staff from the University of Sarajevo
- ▶ For me there was one specific topic of interest based on personal experience: using software but not as administrative support but to improve content delivery
- ▶ Software as educational content:
 - ▶ Pedagogical scenarios
 - ▶ and examples

Importance

- ▶ „Effective teaching and learning is impossible nowadays without the use of various techniques based on modern ICTs and innovations of the so-called 'digital' pedagogy. Within a high-tech information-educational environment, multimedia is one of the powerful tools that assists teachers to **enhance their professional capacity** and helps students to achieve their educational goals. Moreover, modern multimedia in combination with social media and open educational resources contribute to reaching one of the UNESCO main goals in education – **to make quality education more accessible for all.**“

Bent B. Andresen & Katja Katja van den Brink (2013). *Multimedia in education: curriculum*. UNESCO Institute for Information Technologies in Education
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Benefits

- ▶ Use of additional channels of perception;
- ▶ Simulating complicated and/or inaccessible actual experiments;
- ▶ Visualizing abstract content;
- ▶ Presenting the process in a dynamic way to enable interpretation in the wider context of the environment, society, history, etc.
- ▶ Encouraging collaborative learning through online discussions on blogs, web groups, etc.

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Classification of pedagogical scenarios

- ▶ Scenarios of using multimedia as a source of information:
 - ▶ Scenario 1. The use of multimedia as linear educational sources - predetermined;
 - ▶ Scenario 2. The use of interactive multimedia (hypertext based) materials – free for exploring;
- ▶ Scenarios of using multimedia as a tutoring tool:
 - ▶ Scenario 3. The use of multimedia supervising products;
- ▶ Student creator of multimedia educational content
 - ▶ Scenario 4. The use of multimedia productive tools and ingredients

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Scenario 1 – linear and predetermined

- Examples of use:** presentation of complex functions and inaccessible structures/features, connections between concepts and objects, view procedure through steps, specifically for abstract and dynamic examples. Students have little or no prior knowledge.
- Advantages:** A structured presentation of the topic, with a specific beginning and end of the presentation. Students have no distractions during the examination. It requires a low level of digital literacy.
- Disadvantages:** The student has no control over navigation, no changes in content, no interaction and therefore no feedback.

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Scenario 1 – example 1

- Solar system - figure



Solar system distances, [CC BY-SA 3.0](https://commons.wikimedia.org/wiki/File:Solar_system_distances.JPG)
https://commons.wikimedia.org/wiki/File:Solar_system_distances.JPG

Scenario 1 – example 2

- [Amsterdam development](#) - animation

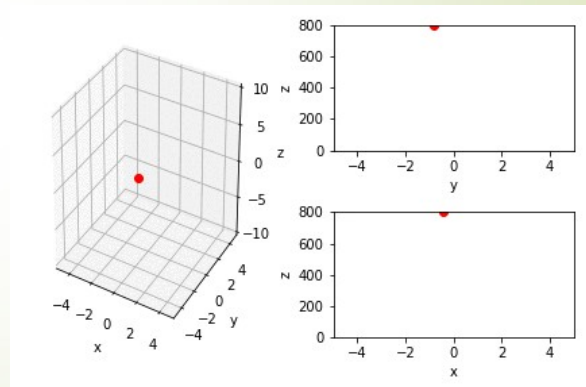


De groei van de Grachtengordel / Expansion of Amsterdam in the Seventeenth Century

<https://www.youtube.com/watch?v=lvSHvfs3G1M>

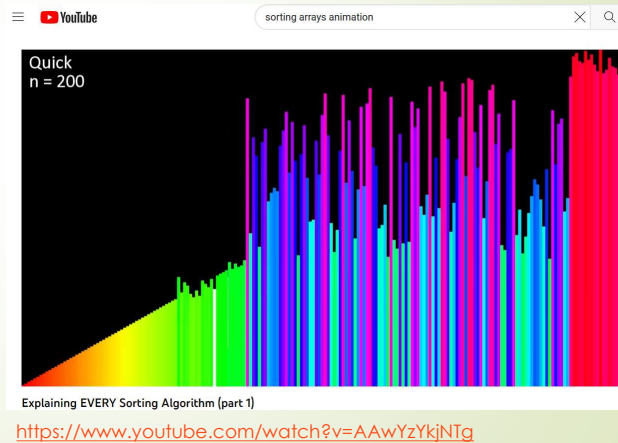
Scenario 1 – example 3

- Vectorcardiogram – dynamic figure



Scenario 1 – example 4

- ▶ Sorting arrays - [animation](#)



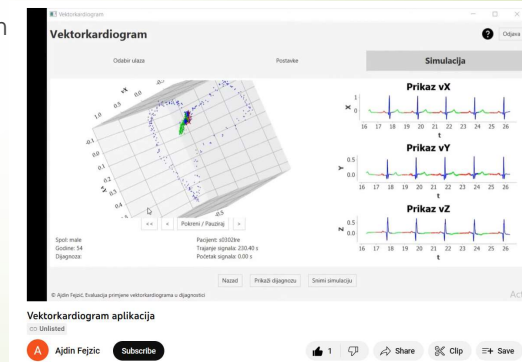
Scenario 2 – interactive navigation

- ▶ **Examples of use:** presentation of information
- ▶ **Advantages:** High interactivity. A very flexible and individual approach to content. Helps the student to become a self-regulated learner who can develop different strategies.
- ▶ **Disadvantages:** The risk of a student getting lost in hyperspace/interaction because navigation is not controlled. Strategies needed to effectively navigate. Although the paths through the content are different, the content itself cannot be altered. No feedback.

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Scenario 2 – example 1

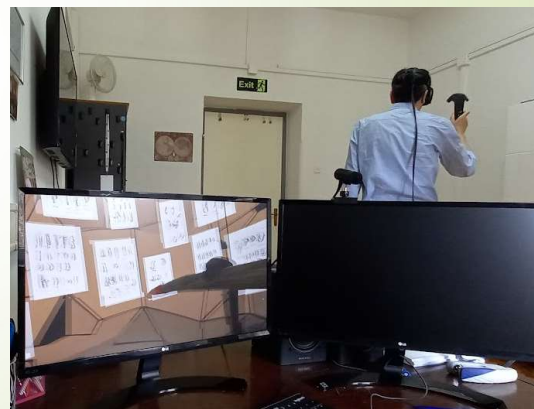
- Vectorcardiogram – [application demo](#)
- Possibility to select signal
- Rotation of the coordinate system
- Diagnosis



<https://www.youtube.com/watch?v=mG7PG69bWFY>

Scenario 2 – example 2

- Serious games - Virtual reality applications
- History and archeology example



Scenario 3 – software as tutoring tool

- ▶ **Examples of use:** Often designed according to the curriculum, in the form of a tutor. Support critical thinking through offering tougher problems to solve. An introduction to the topic being studied.
- ▶ **Strengths:** Students learn at their own pace and according to their needs. Since the student has control over navigation, navigation assistance is provided. Feedback is obtained. Additional motivational factors such as games. The content is structured into tasks.
- ▶ **Disadvantages:** It is necessary to incorporate teaching strategies. Freedom of navigation is limited. The paradox of narrative: The conflict between the freedom of choice or action of the user (student) and the author's (teacher's) control over the narrative.

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Scenario 3 – examples

- ▶ Singing and voice lessons
- ▶ <https://www.facebook.com/Vocalintuition/videos/517917752240056>
- ▶ Foreign languages tutoring applications
- ▶ Programming languages




Singing and voice teachers - apps can work well for online teaching.
 Fancy learning how to use them to enhance your lessons and make your...



Scenario 4 – students as producers

- **Examples of use:** Presentation of his own concepts, the student actively engaged in learning, because he develops the material, and not only reproduces. Use of multimedia as a tool for communication and presentation of students.
- **Advantages:** Concrete presentation of abstract ideas. Conceptualization of thinking. Support thinking and problem solving. Support for collaborative learning. High motivation due to ownership of the result.
- **Disadvantages:** High-tech literacy of students is required. Required resources: software, production tools, even specific hardware.

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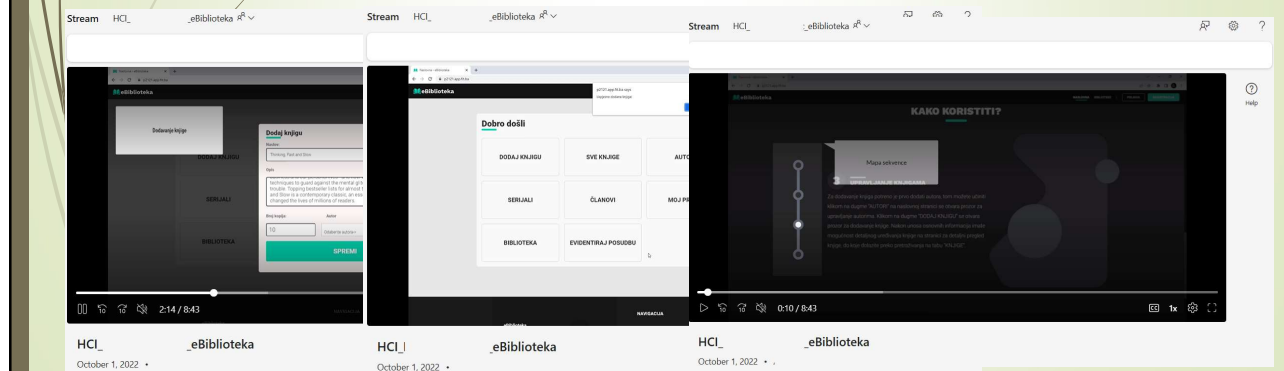


Scenario 4 – examples

- HCI project assessment based on short video
- Video with objective to illustrate:
 1. Implemented functionality
 2. Interaction design principles used in the HCI project implementation
 3. Interaction design patterns used in the HCI project implementation

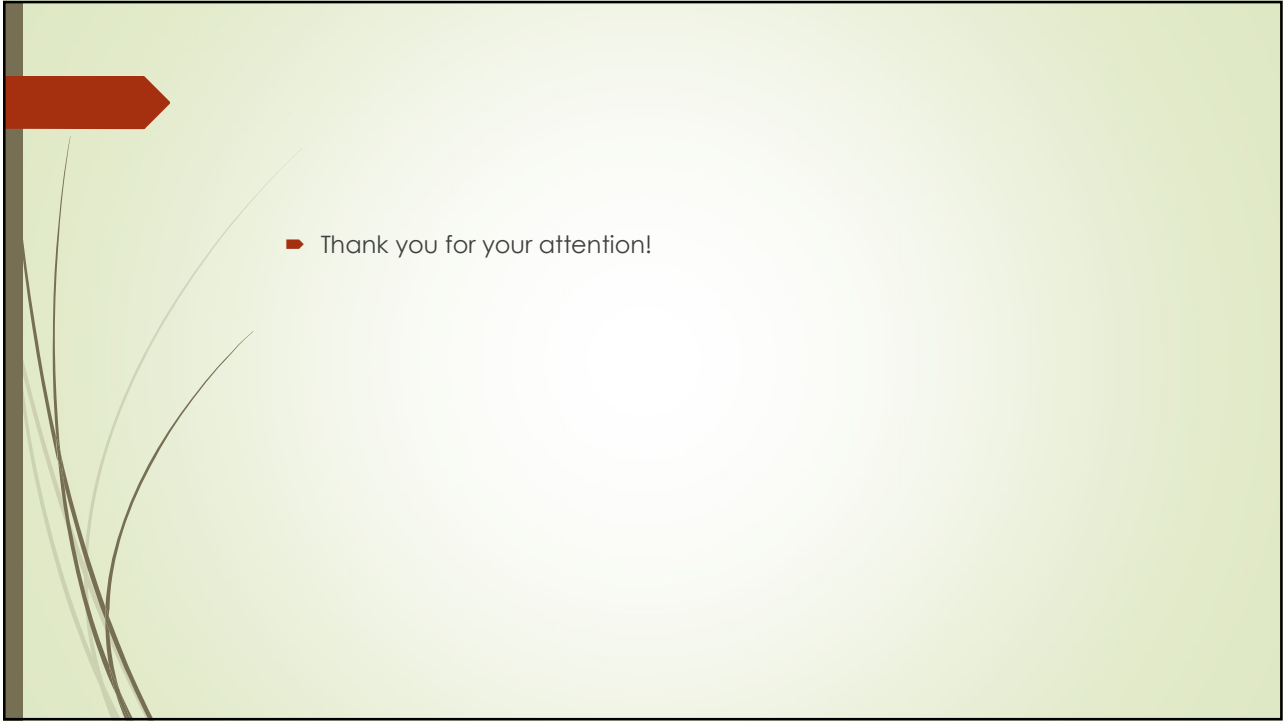
Scenario 4 – examples

1. Functionality – demonstrated and annotated
2. Interaction design principles – highlighted and explained
3. Interaction design patterns – highlighted and explained



Conclusion

- The importance of using applications/multimedia content in teaching is evident
- Important careful planning and choice of scenarios, alignment with planned learning outcomes
- Challenges of resources needed for implementation
- Challenges of linking to evaluation methods



■ Thank you for your attention!