## Teacher's reflection on the results and the lessons learnt

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What went well</strong></td>
</tr>
</tbody>
</table>
| **ETHICS:** Students:  
  - working with ICT was motivating,  
  - took care of the quality of the written form (in mother tongue too) both in ‘My Learning’ and in worksheet completion;  
  - found working in Mahara dynamic and versatile.  
**HISTORY:** Students:  
  - working with Mahara tools went smoothly,  
  - had no problems with worksheet completion,  
  - think that the planned two lessons were appropriate. |
| **What did not go well** |
| **ETHICS:** Students:  
  - still too often just copied the information from the source and did not summarise it using their own words,  
  - did not fully understand the source information they read,  
  - needed assistance at working with Mahara – technical aspect (processing »the view«, 'My learning' tab, saving worksheet into ePortfolio document map).  
**HISTORY:** Students needed:  
  - additional information to set goals,  
  - additional explanation of unknown words while reading written historical documents,  
  - to pay attention to grammatically correct writing. |
| **Lessons learnt** |
| **ETHICS:** Teacher: My worksheet was overloaded with sources and activities.  
**HISTORY:** Teacher: Lesson planning needs to be simplified. |
APPENDIX 1a

ETHICS: «My Learning» – Student lessons’ plan

Q VOLITVE PRI ŠESNAJSTIH

Postavljanje ciljev
Kat te v zvezi s znižanjem starosti za volitveno pravico na 16 let zanima?
Zanima me ali o tem razmišlja EU ali samo Slovenija?
Kaj bi s tem Slovenija pridobila?
Ali smo pri šesnañstih dovolj zreli za volitve?

Predznaj
Kaj te v zvezi z nižanjem volilne pravice na 16 let?
Da se o tem govori, drugače pa še ne vem prav dosti.

Strategije
Kje bi lahko pridobil informacijo, da bi prišel do zastavljenega odgovora odgovorov?
Informacije bom lahko dobila na internetu, v časopisih, vprašam lahko učiteljico in gledam kakšno informativno oddajo o tej temi.

Dokazi
Kako, s čim boš dokazal, da si dosegl zastavljen cilj?
De sem dosegla zastavljen cilj bom dokazala tako, da bom veliko vedela o tej temi, da bom znala utemeljiti svoje mnenje do temo, da bom znala odgovoriti na učiteljico in svoja vprašanja.

Samoevaluacija
Mislim, da sem bila uspešna pri doseganju ciljev, saj:
- Vem veliko o tej temi.
- Znam odgovoriti na svoja vprašanja, ki sem si jih postavila pri postavljanju ciljev.
APPENDIX 1b

HISTORY: »My Learning« – Student lessons’ plan

DATOTEKE ZA PRENOS

Delovni list ZGO 8.odt
485JB | četrtek, 13. november 2014 | Poveča

ZGODOVINA 2. KROG-MATIC M.

Postavljanje ciljev
Želimo izvedeti ali sta Deklaracije o neodvisnosti kaj vplivali na današnjo Slovensko ustavo.
Želimo tudi izvedeti kaj vse piše v Deklaraciji.
Želimo izvedeti kako sta deklaracije nastali.
Želimo tudi izvedeti kaj so v tistem času želeli spremeniti in če je sedaj tako kot so si zamišljali.

Predznanje
Državljani, ki so polnoletni lahko volijo.
Lahko smo voljeni.
Ljudje se lahko uprejo, s peticijami ali protest, ki ne vključujejo nasilja.
Ljudje imajo pravico nekoga tožiti na sodišču in do odvetnika.
Demokracija je priča iz besede ljudstvo(demos) in je oblika družbenega sistema kje so si ljudje enaki.
Pravice državljani so zapisane v ustavi.

Strategije
Prebral bom deklaracije in ustavo Slovenije, da bom lahko tako primerjal pravice.
Prebral si bom kaj o začetku deklaracije na internetu ali v knjigi.

Dokazi
Da bom uspešno izpolnil delovni list. Da bom imel neko znanje o primerjanju deklaracij in ustave.

Samoevalvacija
Delovni list sem uspešno opravil. Delovni list je bil dobro mestačen in sem se veliko novega naučil, mislim da če bi bili vsi učenci pri stvari
### APPENDIX 2a

**ETHICS: Checklist (Formative assessment)**

<table>
<thead>
<tr>
<th>ČEKLISTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iz danih virov izbere ključne informacije in pomembne podrobnosti, dejstva in dokaze</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UČENEČ</th>
<th>1. krog</th>
<th>2. krog</th>
<th>3. krog</th>
<th>1. krog</th>
<th>2. krog</th>
<th>3. krog</th>
<th>1. krog</th>
<th>2. krog</th>
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### APPENDIX 2b

**ETHICS: Checklist (Formative assessment)**

<table>
<thead>
<tr>
<th>Učenec</th>
<th>Zna utemeljiti vsebino virov</th>
<th>Odgovori so poglašeni</th>
<th>Znajo narediti primerjavo med različnimi viri – podobnosti/razlike</th>
<th>Zna sklepati glede na vsebino virov</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DA</td>
<td>DELNO</td>
<td>NE</td>
<td>DA</td>
</tr>
</tbody>
</table>

| | | | | |
| | | | | |
APPENDIX 3a

ETHICS: Example of a completed worksheet

gledajo poročila, ampak ljudje vedo kaj se dogaja in se vseeno nič ne spremeni. Morali bi se izvesti bolj močni prijemi. Po moje se tudi osebe na vodilnih položajih ne bi zamenjale. Glede na to, da je veliko upokojencev, ki radi volijo, bi bila vplivnost mladih v državi mogoče malo povečana s to pobudo.

Vir 6: Rok, 19 let, dijak

Menim, da se možnost voliti pri 16 letih ne bi odnesla, saj v tem obdobju mladostniki še niso dozoreli oz. so še v puberteti, zaterez še ne zna razmišljati niti za svoje dobro. Zato menim, da se v te vode mladi ne bi smeli spuščati. Definitivno dvornim, da bi se udeležba na volitvah povečala, s tem pa tudi dvornim, da bi bili mladi bolj aktivni državljani, s tem pa tega nemudoma. Zelo dvornim, da bi se z pobudo zamenjali ljudje na vodilnih mestih v RS, saj mladi že zdaj nimamo veliko besede pri tem. In tudi mladi ne bi prišli do večje vplivnosti v državi, če bi se to sprejelo.


- Preberi Lukovo in Rokovo izjavo o možnosti volitev pri 16.ih. Kakšno je njuno stališče do tega?

Z volilno pravico pri šestnajstih se ne strinjata.

S čim utemeljujeta svoje stališče?

Menita da s volilno pravico pri šestnajstih, ne bi pridobili, saj mladi v teh leht še niso dovolj zreli,

In jih ne bi veliko volilo. Rok meni, da se mladi tako ali tako ne zanimajo predrano za politiko, Luka

pa da so mladi že brez volilne pravice pri šestnajstih dovolj aktivni.

Čemu menijo, da se razlikujeta stališče Sveta Evrope in bivše slovenske vlade, ki jo je vodila Alenka Bratušek?

Razlikujeta se, saj imajo različna mnenja in so oboj navedli realistične argumente, ki jih morajo pri odločitvi upoštevati.
APPENDIX 3b

HISTORY: Example of a completed worksheet

Človekove pravice in temelne svoboščine se uresničujejo neposredno na podlagi ustave. /.../ Človekove pravice in temelne svoboščine so omejene samo s pravicami drugih in v primerih, ki jih ujema ta ustava. /.../

43. člen

Voliina pravica je splošna in enaka.
Vsak državljan, ki je dololumn 18 let, ima pravico voliti in biti voljen. /.../

[https://www.pravice-svoboščine.si/temelna-ustava/cenik-temelnih-svoboščin/nezgodna/3-18/]

1. Katere demokratične pravice zagotavlja naša Ustava?
   Volino pravico, enakost pred zakonom, varovanje človekovih pravic...

Nalog 2: Primerjava listin

<table>
<thead>
<tr>
<th></th>
<th>Deklaracija o neodvisnosti</th>
<th>Deklaracija o pravicah človeka in državljan</th>
<th>Ustava</th>
</tr>
</thead>
<tbody>
<tr>
<td>Katere pravice so omejene v listineh?</td>
<td>Neodvisnost, življenje, sreča, izbira in odstavitev vlade</td>
<td>Enakost pred zakonom, svoboda mišljenja in tiska, sodelovanje pri postavljanju zakonov, obračun dela, poštenih predstavnikov</td>
<td>Demokracija, varovanje človekovih pravic, enakost pred zakonom, volina pravica</td>
</tr>
</tbody>
</table>
APPENDIX 4

ETHICS: Example of a student’s opinion from Mahara – Forum

Examples of good practice: 10 ETHICS AND HISTORY
11 PHYSICS:
The pressure in solids

Valentina Mlakar, Primary school Sava Kladnika, Sevnica

<table>
<thead>
<tr>
<th>Subject</th>
<th>Physics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Design Title</td>
<td>THE PRESSURE IN SOLIDS</td>
</tr>
<tr>
<td>Year group</td>
<td>Grade 8 (average age: 13 years)</td>
</tr>
<tr>
<td>Language</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Duration</td>
<td>Three lessons (135 minutes)</td>
</tr>
</tbody>
</table>

 Goals

Students
- gain knowledge about pressure (understand the concept of pressure, learn how to calculate pressure – using the correct formula),
- increase active participation and involvement during lessons,
- activate cross-curricular skills’ integration,
- establish learning methods that bring sustainable knowledge,
- develop effective learning strategies,
- reinforce their reading comprehension skills.

Concise description of the content

Open-ended assignments are given to students in order to encourage them to further reflect on the lessons learned and to help them develop interdisciplinary connections and reasoning.

Furthermore, in order to increase their involvement and overall participation, each task is solved individually. While reporting on their findings and results, a tabular form is created by the teacher for each student. This table allows students to reflect on their findings and broaden their critical thinking capabilities. For instance, a simple experiment involving a screw placed between two fingers has proved to increase critical thinking of each individual student. Namely, each student must perform the experiment on his/her own and comment on the outcome by using his/her own experience and knowledge.

Each student also has to plan his/her own learning strategies by using web application named Mahara and the ‘My learning’ tab. Such a strategy not only further increases effectiveness of learning, but it also encourages students to take the responsibility for their own learning.

When students are to study new themes on their own (e.g. self-directed learning) they are given appropriate supplementary materials in electronic form. Such learning material is accompanied with extensive explanation, images and figures and examples of answer sheets. The learning material also contains several topic-related questions. This allows students to better understand, conceptualise and visualise the topic discussed and encourages them to read the material carefully.
In order to make the newly-acquired knowledge more lasting and to discuss and use it with greater ease, students are also encouraged to draw mind maps. The mind maps, as drawn by students, are also used while solving problems specified on learning sheets. They are given out and completed during classes. Such an approach has proved to have a positive impact on both content understanding and sustainability of knowledge. The completed learning sheets are corrected by the teacher. This in turn gives students direct feedback on the quality of the acquired knowledge.

Motivation for learning and close reading with reasoning (e.g. active reading) is greatly increased by optional assignments, which students completed as survey questionnaires and delivered as Google documents (e.g. Google Docs).

The text-based assignments are done in e-Portfolio (si. E-listovnik). Although students work in smaller groups, each of them must complete the assignment on his/her own. Individual groups are differentiated according to the complexity of the given assignments. While solving these assignments, tailored to students' abilities, students develop and expand their critical thinking skills. Additionally, the assignments are designed to induce interdisciplinary connections of their background knowledge. Each assignment is reviewed and corrected and appropriate feedback is given to each individual.

The acquired knowledge must then be used when performing, observing and experimenting. Namely, in the given experiment the students must determine the pressure under a cylindrical container. Therefore, in order to be able to use the formula for calculating the pressure, students must first decide on how to determine the area of the bottom of the container (e.g. area of the circle).

<table>
<thead>
<tr>
<th>Concise description of the content</th>
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</thead>
<tbody>
<tr>
<td>In order to make the newly-acquired knowledge more lasting and to discuss and use it with greater ease, students are also encouraged to draw mind maps. The mind maps, as drawn by students, are also used while solving problems specified on learning sheets. They are given out and completed during classes. Such an approach has proved to have a positive impact on both content understanding and sustainability of knowledge. The completed learning sheets are corrected by the teacher. This in turn gives students direct feedback on the quality of the acquired knowledge. Motivation for learning and close reading with reasoning (e.g. active reading) is greatly increased by optional assignments, which students completed as survey questionnaires and delivered as Google documents (e.g. Google Docs). The text-based assignments are done in e-Portfolio (si. E-listovnik). Although students work in smaller groups, each of them must complete the assignment on his/her own. Individual groups are differentiated according to the complexity of the given assignments. While solving these assignments, tailored to students' abilities, students develop and expand their critical thinking skills. Additionally, the assignments are designed to induce interdisciplinary connections of their background knowledge. Each assignment is reviewed and corrected and appropriate feedback is given to each individual. The acquired knowledge must then be used when performing, observing and experimenting. Namely, in the given experiment the students must determine the pressure under a cylindrical container. Therefore, in order to be able to use the formula for calculating the pressure, students must first decide on how to determine the area of the bottom of the container (e.g. area of the circle).</td>
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</table>

<table>
<thead>
<tr>
<th>Keywords</th>
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<tbody>
<tr>
<td>interdisciplinary connections, feedback, active learning</td>
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</table>

<table>
<thead>
<tr>
<th>Methodology</th>
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</thead>
<tbody>
<tr>
<td>individual work, group work and work in pairs</td>
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</table>

<table>
<thead>
<tr>
<th>21st century skill(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>· critical thinking, in particular self-reflection,</td>
</tr>
<tr>
<td>· skills and strategies to enable students to use the program Mahara and similar software,</td>
</tr>
<tr>
<td>· cooperation, communication and teamwork,</td>
</tr>
<tr>
<td>· responsibility to obtain their own knowledge and to learn about active methods, which help students to gain more sustainable knowledge more efficiently</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ICT tools used</th>
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</thead>
<tbody>
<tr>
<td>Mahara – ‘My learning’ tab, forum, views</td>
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</tbody>
</table>
Students:
- activate their prior knowledge and their abilities of interdisciplinary integration while solving an open type assignment (e.g. an assignment which contained an image of the rectangular block and data about the mass and the edges of the block, stimulated the students not only to consider what can be calculated using the given data, but also to check or calculate the newly emerging considerations),
- design and carry out a simple experiment by using a screw. They are supposed to clarify the observed phenomena and provide convincing explanations through which they are further familiarized with the concept of pressure,
- plan and design their own learning in Mahara software (‘My learning’). They fill out the forms of the phases named ‘Prerequisites’ (Predznanje) and ‘Setting goals’ (Postavljanje ciljev). As an assisting tool, they are free to use the materials/sources, text and images, prepared in the ePortfolio,
- read the prepared material on the subject of pressure,
- solve problems (test/task sheets) in order to reinforce the knowledge about pressure:
  - conversion between units for measuring pressure,
  - calculating the pressure,
  - understanding the pressure,
  - while solving the given problems, students are allowed to use mind maps and the materials prepared in ePortfolio,
- review how an individual student understands the newly-learned knowledge about pressure; using multiple-choice assignments prepared by Google Docs technology,
- enhance and consolidate knowledge and interdisciplinary integration by doing ePortfolio text assignments. The assignments are differentiated among several groups of students and tailored to their abilities (each group consists of students with similar level knowledge of physics),
- have to determine the pressure under the cylindrical container during the experimental work,
- complete a report about their learning and activities in Mahara: learning strategies, self-evaluation and evidence.
## Accompanying materials/resources for the learning design

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>File name / URL</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple choice assignments for reviewing the individual’s knowledge about pressure</td>
<td>Prepared by using Google Docs technology – Web link to Mahara</td>
<td><a href="http://url.sio.si/emx">http://url.sio.si/emx</a></td>
<td>Slovenian</td>
</tr>
<tr>
<td>Group assignments – assignments are solved by groups of students in order to gain feedback (easier assignments)</td>
<td>Word document – Web link to Mahara</td>
<td><a href="https://listovnik.sio.si/group/fizika-3-d-sile-os-sevnica/kvader">https://listovnik.sio.si/group/fizika-3-d-sile-os-sevnica/kvader</a></td>
<td>Slovenian</td>
</tr>
<tr>
<td>Group assignments – assignments are solved by groups of students in order to gain feedback (intermediate assignments)</td>
<td>Word document – Web link to Mahara</td>
<td><a href="https://listovnik.sio.si/group/fizika-3-d-sile-os-sevnica/svadra">https://listovnik.sio.si/group/fizika-3-d-sile-os-sevnica/svadra</a></td>
<td>Slovenian</td>
</tr>
<tr>
<td>Group assignments – assignments are solved by groups of students in order to gain feedback (advanced assignments)</td>
<td>Word document – Web link to Mahara</td>
<td><a href="https://listovnik.sio.si/group/fizika-3-d-sile-os-sevnica/valja">https://listovnik.sio.si/group/fizika-3-d-sile-os-sevnica/valja</a></td>
<td>Slovenian</td>
</tr>
<tr>
<td>A product of a student – open-type assignment solved on a task sheet</td>
<td>Scan of a student’s product</td>
<td>Appendix 1</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Mind map drawn by a student – a part of results generated by students during self-directed learning about pressure</td>
<td>Scan of a student’s product.</td>
<td>Appendix 1</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Assignments solved by students for the consolidation of knowledge about pressure</td>
<td>Scan of a student’s product</td>
<td>Appendix 1</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Assignments are solved after the material on pressure has been processed</td>
<td>Scan of a student’s product (Mahara record)</td>
<td>Appendix 2</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Students plan and design their own learning by using ‘My learning’ tab in Mahara software</td>
<td>Scan of a student’s product</td>
<td>Appendix 2</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Survey, multiple-choice assignments – Google Docs technology. The surveys are answered via web-link in Mahara software</td>
<td>Survey scan taken from Mahara software</td>
<td>Appendix 3</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Implementation photos/videos</td>
<td>Experimental work executed in the classroom – measuring pressure under the cylindrical container</td>
<td>Photos of students</td>
<td></td>
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<table>
<thead>
<tr>
<th>Summary of the completed surveys</th>
<th>Results scanned from Google Docs</th>
<th>Appendix 4</th>
<th>Slovenian</th>
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</thead>
<tbody>
<tr>
<td>Example of a group assignment: Pressure under cylinders</td>
<td>Scan of the given assignment</td>
<td>Appendix 5</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Solution of the assignment as solved by students – their feedback</td>
<td>Scan of a feedback as provided by Mahara software</td>
<td>Appendix 6</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Example of a group assignment: Pressure under a block (easier assignment)</td>
<td>Scan of interface in Mahara</td>
<td>Appendix 7</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Example of a group assignment: Pressure under a blocks</td>
<td>Scan of the given assignment</td>
<td>Appendix 8</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Solution of the assignment as solved by students – their feedback and, feedback given to students by the teacher</td>
<td>Scan of interface in Mahara</td>
<td>Appendix 9</td>
<td>Slovenian</td>
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Reflection on the results and on the lessons learnt

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<th>Description</th>
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**What went well**

Open-ended type of assignments were well received. I was quite surprised at their enthusiasm and commitment.

The tabular picture, generated on basis of students’ reports, enabled students to have freedom of judgment about the accuracy of their own claims and results. At the same time students saw how far their knowledge already reaches, which further increased their motivation.

Due to the open type assignments students filled out the ‘My learning’ tab (in Mahara), especially the part on background knowledge, with greater ease. While reading the materials and self-monitored mind map studying, they had to draw and were encouraged to repeatedly return to the material and read through it more carefully. Furthermore, since they were allowed to use the mind maps during solving numerical problems, the given assignments were completed quite successfully. Students completed the open type assignments with enthusiasm. When they asked me about the correct answer, I directed them to read the question carefully and use the mind map, rather than giving them more concrete or direct answers. In this way I tried to familiarise them with the concept of independent, self-monitored learning and its implications in practice.

Students also solved assignments in groups for the first time. All members of each group were solving given problems at the same time and were also able to observe progress and ideas of each individual in the group. This certainly increased motivation as well as productivity of each individual member. Besides, the approach allowed them to communicate and exchange ideas freely, “all in one”.

To sum up, formative assessment and interdisciplinary cooperation definitely increase active involvement of students in the classroom work, as well as students’ motivation and responsibility to learn. By using ICT, I found different effective ways of connecting the content across disciplines and formatively monitoring work and progress of each individual student.

**What did not go well**

While doing text assignments in groups the students expressed a concern regarding the indication of the potencies, especially units (e.g. square meters). Namely, in Mahara software students cannot indicate potencies, nor does a tab for equations (e.g. Word equations) exist. As a result the equations and the problem solving process were written down into notebooks, and only the final results were posted into Mahara. The downside of such technique is also reflected in the review process. Namely while reviewing student’s work teacher cannot indicate where (at which equation) in the problem solving process the student made a mistake.

Furthermore, in order to implement the described teaching process, each lesson has to be well prepared in advance, which requires a lot of pre-prepared material. However, the lesson itself brings satisfaction to both the students and the teachers and allows for teachers to provide each individual student with detailed and structured feedback on the quality of his/her learned knowledge.

The major problem, however, still lies mostly in the eyes and minds of the students. Namely, most of the students who knew what had to be improved or what had to be studied in more detail, were still not prepared to perform the extra effort in order to implement the strategies suggested by/in the feedback.
Lessons learnt

The review of multiple choice assignments, solved in Google Docs is a time consuming effort. The results have to be analysed immediately and the incorrect answers clarified. The summaries of the completed survey (multiple choice assignments), must be prepared, analysed and further discussed with students.

It seems that teachers should also pay more attention while communicating the feedback to students and also observe how students react to the given feedback.

Most of the students are already quite skillful with the Mahara software. Since solving assignments via the software increases their motivation and due to the fact that results are reviewed and corrected in Mahara with a certain degree of ease, some of the homework is already given out to the students electronically via Mahara software.

APPENDIX 1

Examples of students’ products

Picture 1: Open-type assignment solved on a task sheet.

Picture 2: Mind map drawn by a student – a part of results generated by students during self-directed learning about pressure.
Preverjanje znanja:

1. Pretvori:
   a) \( \frac{0.2 \text{ N}}{\text{cm}^2} = \frac{0.2 \text{ N}}{\text{dm}^2} = \frac{0.2 \times 10 \text{ N}}{10 \text{ dm}^2} = 0.2 \text{ Pa} \)
   b) \( 4500 \text{ Pa} = \frac{4500 \text{ N}}{1000 \text{ m}^2} = 4,5 \frac{\text{ N}}{\text{m}^2} = 4,5 \text{ kPa} \)
   c) \( 0,05 \frac{\text{ N}}{\text{cm}^2} = \frac{0.05 \times 10 \text{ N}}{10 \text{ cm}^2} = 0.5 \frac{\text{ N}}{\text{dm}^2} = 0.5 \text{ kPa} \)

2. Vsi kvadri na slikah so enaki. Kvadre smo postavili na tla. Masa vsakega kvadra je 0,5 kg. Kvadre se dotika tla po ploskvi veliki 1 \( \text{dm}^2 \). Koliko je tleh pod kvadrom, ki se dotika tla?

   \begin{align*}
   m_1 &= 2,5 \text{ kg} \\
   m_2 &= 1 \text{ kg} \\
   m_3 &= 1,5 \text{ kg} \\
   \end{align*}

   \( \begin{align*}
   p_1 &= 5 \frac{N}{\text{dm}^2} \\
   p_2 &= 10 \frac{N}{\text{dm}^2} \\
   p_3 &= 15 \frac{N}{\text{dm}^2} \\
   \end{align*} \)

   Kako se spremeni tleh, če silo dvakrat, trikrat povečamo, stična ploskev pa ostane nespremenjena.

Poveča se 2x, 3x, 4x ...

3. Vsi kvadri na sliki imajo enako težo 30 N in smo jih postavili na tla. Pod vsako sliko je zapisana velikost stične ploske med tlemi in kvadrom.

   \begin{align*}
   S_1 &= 10 \text{ dm}^2 \\
   S_2 &= 5 \text{ dm}^2 \\
   S_3 &= 2 \text{ dm}^2 \\
   \end{align*}

   \( \begin{align*}
   F_1 &= 30 \text{ N} \\
   F_2 &= 30 \text{ N} \\
   F_3 &= 30 \text{ N} \\
   \end{align*} \)

   \( \begin{align*}
   p_1 &= 3 \frac{N}{\text{dm}^2} \\
   p_2 &= 6 \frac{N}{\text{dm}^2} \\
   p_3 &= 15 \frac{N}{\text{dm}^2} \\
   \end{align*} \)

   Kako se spremeni tleh, če se stična ploskev dvakrat, petkrat zmanjša, sila pa ostane nespremenjena?

\( 2 \times, 5 \times, 10 \times \) zmanjša

4. Naj ima maso 64 kg. Površina vsakega njegovega stopala je 80 \( \text{cm}^2 \). Naj stoji na obeh nogah.

   a) Kolikšen je tleh pod vsako nogo? 
   \( \begin{align*}
   \text{m} &= 64 \text{ kg} \\
   \text{s} &= 64 \times 9,8 \text{ m/s}^2 \\
   \text{F} &= 627.2 \text{ N} \\
   \text{A} &= 80 \text{ cm}^2 \\
   \text{p} &= 80 \text{ kPa} \\
   \end{align*} \)

   b) Kolikšen je tleh pod obema nogama?

Naj nato stoji na eno nogo. Koliko je tleh pod nogo?

\( \text{p} = 80 \text{ kPa} \)

Picture 3: Assignments solved by students for the consolidation of knowledge about pressure.
APPENDIX 2

Example of a student’s learning plan

Postavljanje ciljev
- naučila bi se enote za tlak
- kako izračunati tlak
- kako pretvarjati enote za tlak
- se naučiti kako izračunati tlak

Priznanje
- znam izračunati ploščino ploskve
- znam izračunati gostoto telesa
- znam izračunati težo
- znam izračunati gostoto, prostornino, silo zemlje na telo ter silo tal

Strategije
- branje snovi v wordu in zapisovati snov v zvezek
- izpolnili smo miselni vzorec
- branje snovi v učbeniku
- razlaga učitelja in sodelovanje
- anketni vprašalnik

Dokazi
- učni list
- zapisana snov v zvezku
- narejen miselni vzorec
- izpovjed zavihek moje učenje

Samoevaluacija
- računanje teže
- računanje gostote
- učni list mi ni bil preveč težek razen pri pretvarjanju sem bila malo slabša.
- znam izračunati tlak
APPENDIX 3

Example of a survey in Google Docs technology

**Tlak**

*Kako izračunamo tlak?*
- Da silo, ki deluje na leto množino s ploščino, na kateri deluje sila...
- Da silo, ki deluje na leto množino s ploščino, na kateri sila deluje...
- Da ploščino po kateri deluje sila delimo s silo.

*Količina, ki nam pove, kolikšna sila deluje na določeno ploskev se imenuje:*

**Kako se spremeniti tlak, če silo dvakrat povečamo, stična ploskev ostane nespremenjena?**
- Tlak se dvakrat poveča.
- Tlak se dvakrat zmanjša.
- Tlak se ne spremeni.

**Tlak se v opisanih primerih ne spremenija. Kako moramo spremeniti stično ploskev, če spremenimo silo?**

<table>
<thead>
<tr>
<th>Ploščina po kateri sila deluje bo trikrat večje.</th>
<th>Ploščina po kateri sila deluje bo trikrat manjša.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silo trikrat zmanjšamo.</td>
<td>Silo trikrat povečamo.</td>
</tr>
<tr>
<td>Silo trikrat zmanjšamo.</td>
<td>Silo trikrat povečamo.</td>
</tr>
</tbody>
</table>

*Kako nas ščiti čelada pred udarci?*
- Poveča tlak.
- Poveča ploskev, po kateri sila deluje.
- Zmanjša tlak.
- Zmanjša silo.

**Namesto čevljev obušeš krpilje. Pojasni, kako se spremenijo sila, ploščina po kateri sila deluje in kako tlak.**
- Sila se bistveno ne spremeni.
- Ploščina po kateri sila deluje se poveča.
- Ploščina po kateri sila deluje se zmanjša.
- Tlak se poveča.
- Tlak se zmanjša.

[Google Forms](https://forms.google.com)
APPENDIX 4

Example of results scanned from Google Docs

APPENDIX 5

Example of a group assignment: Pressure under cylinders

1. Dva valja smo položili na ta, nad vsakim valjem je narisana stična ploskev med valjem in tleni.
Maseboh valjev sta enaki. Vsak valj ima maso $1.57\text{ kg}$. 
   a) Odčitajte pomer prvega valja in drugega valja. Kolikokrat je pomer drugega valja večji od pomena prvega valja?
   b) Izračunajte stična ploskev prvega valja $S_1$ in stična ploskev drugega valja $S_2$.
   c) Kolikokrat je stična ploskev drugega valja večja od stične ploske prvega valja?
   d) Izračunajte tlak pod prvim valjem $p_1$ in ga izrazi v Pa. Izračunajte tlak pod drugim valjem $p_2$ in ga izrazi v Pa.
   e) Kolikokrat je tlak pod drugim valjem manjši od tlača pod prvim valjem?

---

Examples of good practice: 11 PHYSICS
APPENDIX 6

Example of feedback as provided by Mahara software
APPENDIX 7

Example of a group assignment: Pressure under a block

Masa vsakega lesenega kvadra na sliki je 10 kg.

a) Koliko je teža vsakega kvadra? 

b) S kolika silo pritiseta vsak kvader na tla?

c) Izračunaj velikost stične ploskve $S_1$ med kvadrom in tlemi na prvi sliki in velikost stične ploskve $S_2$ med kvadrom in tlemi na drugi sliki.

d) Izračunaj tlak pod prvim kvadrom $p_1$ in tlak pod drugim kvadrom $p_2$. Izrazi ga v Pa.

e) Po kolikokrat večji ploskvi deluje sila kvadra na tla v drugem primeru?

f) Kolikokrat je tlak pod prvim kvadrom večji kot pod drugim kvadrom?
APPENDIX 8

Example of feedback as provided by Mahara software

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Example of feedback as provided by Mahara software.
Example of feedback as provided by Mahara software

APPENDIX 9

Examples of good practice: 11 PHYSICS
# 12 GEOGRAPHY, ENGLISH: Apartheid

**Katja Knific and Maruša Bogataj, OŠ Predoslje, Kranj**

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Geography, English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Design Title</td>
<td>APARTHEID</td>
</tr>
<tr>
<td>Year group</td>
<td>Grade 8 (average age: 13–14 years)</td>
</tr>
<tr>
<td>Languages</td>
<td>Slovenian &amp; English</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>One cycle (about six lessons: one 45-minute lesson in the computer room, other lessons are home study – reading about the topic, writing about it, expressing arguments – every student should have enough time for searching the topic information)</td>
</tr>
</tbody>
</table>
| **Goals**         | Students:  
  - find new information about a given topic and everything connected with it,  
  - find an appropriate photo,  
  - think about the reasons for racism,  
  - consider the reasons for and consequences of racial segregation,  
  - develop the skill of planning and evaluating their work,  
  - share their thinking with their critical friends in Mahara,  
  - improve their own critical thinking skills and autoregulative behaviour,  
  - integrate content and learning (CLIL). |
| **Concise description of the content** | The main aim of the learning cycle for the students is to do a research about the topic, get more information about it, get to know Nelson Mandela, make their own opinion about him and the situation in South Africa in Slovenian and in English. At the same time students plan and evaluate their work.  
  First of all, students are informed about the topic for their work and are given short instructions. They need to fill out the ‘My learning’ tab in Mahara, refresh their pre-knowledge, set their own goals and learning plans. They fill in the ‘My learning’ tab for both subjects, Geography and Slovenian.  
  Then their homework starts. They watch a short video. The link for it was provided by the Geography teacher. They try to find different information about apartheid and Nelson Mandela. They design a short presentation about it, which includes their own thinking and arguments for their statements. They also add an appropriate photo. Then they share the presentation with their critical friends and discuss the topic in Mahara. They share their work and discussion with the teacher as well.  
  Now, when they better understand the topic and they have some more information about apartheid and Nelson Mandela, it is time to make a step forward. There is another title to think about. This time in English. Students think and write about *Black is beautiful*. They express their thoughts, opinions, make arguments for their statements. Again they share their work in Mahara with their critical friends and their teacher.  
  At the end they evaluate their work by filling out ‘My learning’ tabs in Mahara. |
### Keywords
apartheid, Nelson Mandela, Black is beautiful

### Methodology
work in groups, in pairs and individually

### 21st century skill(s)
ICT skills, critical thinking, CLIL (Content and Language Integrated Learning)

### ICT tools used
- Mahara – a fully featured web application to build your electronic portfolio
- Google – the internet search for information

### Students’ activities
Students:
- fill out the ‘My learning’ tab in Mahara (they plan and monitor their work),
- watch a video, taken in the streets of Johannesburg,
- find and choose a photo, which represents the sentence Black is beautiful,
- write about apartheid, Nelson Mandela and his influence using their mother tongue,
- discuss the subject with their critical friends,
- think about the sentence Black is beautiful again, trying to find different arguments for their statements and write a short presentation of their thinking/views in English.

### Accompanying materials/resources for the learning design

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>File name / URL</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers’ guidance, introduction and instruction for ‘My learning’</td>
<td>Instructions for Geography and English work in the school e-class</td>
<td>Appendix 1 and 2</td>
<td>Slovenian English</td>
</tr>
<tr>
<td>An Afl tab in Mahara, where students plan their own learning made for Geography</td>
<td>Instructions in School e-class</td>
<td>Appendix 3 and 4</td>
<td>Slovenian</td>
</tr>
<tr>
<td>At the beginning of their work students watch a short video.</td>
<td></td>
<td><a href="http://www.youtube.com/watch?v=UjjxadhhV5sv=UjjxadhhV5sv=UjjxadhhV5sv">http://www.youtube.com/watch?v=UjjxadhhV5sv=UjjxadhhV5sv=UjjxadhhV5sv</a></td>
<td></td>
</tr>
<tr>
<td>Students choose appropriate photos.</td>
<td>Students’ chosen photos</td>
<td>Appendix 5 and 6</td>
<td></td>
</tr>
<tr>
<td>Students write about Apartheid and about their reactions to the sentence Black is beautiful.</td>
<td>Student’s page in Mahara</td>
<td>Appendix 7 and 8</td>
<td>Mother tongue</td>
</tr>
</tbody>
</table>
**Teacher’s reflection on the results and the lessons learnt**

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What went well</strong></td>
<td>Most students did not have any difficulties finding the information, using the Internet, and they did not have difficulties using Mahara either. They enjoyed watching the video, searching for appropriate photos and sharing their thoughts and ideas.</td>
</tr>
<tr>
<td><strong>What did not go well</strong></td>
<td>Students needed a lot of encouragement and a lot of help at filling out their learning plans – they are still not used to taking control of their own learning. It was a real challenge for everyone to express their arguments. Students found it really difficult to discuss about the topic in English. Some of them did it in Slovenian.</td>
</tr>
<tr>
<td><strong>Lessons learnt</strong></td>
<td>We should use English outside the classroom (English lessons) more often, so that students have an opportunity to use their knowledge and become more self-confident in speaking and expressing their thoughts in a foreign language. They should have more opportunities to create their learning goals and plans and to express their thoughts/views and ideas.</td>
</tr>
</tbody>
</table>
APPENDIX 1

Instructions for Geography

1. Oglej si video, ki je bil posnet na ulici Johannesburga.

2. V e-listovnik pod razdelkom Vsebina_Dnevnik naredi nov vnos Geografija Apartheid.
   a) Izberi in vnesi fotografijo z naslovom »Črna je lepa«.
   b) Zapiši svoje razmišljanje o apartheidu in o vlogi, ki jo je pri tem imel Nelson Mandela. Svoje razmišljanje strni v vsaj desetih povedih.
   c) Svojemu kritičnemu prijatelju pošlji vprašanje na to temo. Njegov odgovor nato vključi v svoje besedilo.

3. Svoj zapis o apartheidu deli z učiteljico.

APPENDIX 2

Instructions for English

V E-listovniku ponovno odpri novo stran v razdelku Dnevnik. Poimenuj jo Black is beautiful.
In kaj te čaka tokrat?

BLACK IS BEAUTIFUL

What do you think about this sentence? Do you agree or maybe disagree? Why?
Do you think there are different meanings of the sentence possible? Can you explain?
Write at least 10 sentences, thinking about the title Black is beautiful. Don’t forget to include arguments for your statements.

Kaj meniš o zgornji povedi? Se z njo strinjaš ali mogoče ne? Zakaj?
Misliš, da se v njej lahko skrivajo različni pomeni? Lahko to razložiš?
Napiši vsaj 10 povedi o zgornjem naslovu »Black is beautiful«. Ne pozabi vključiti argumentov za svoje trditve.

Napisanega ne pozabi shraniti.
Shranjeno besedilo deli s kritičnim prijateljem ter učiteljicami.
In seveda, komentar prijatelju naj bo vzpodoben. Povej, kaj ti je pri njegovem zapisu všeč in kaj ne. Svoj komentar argumentiraj.
APPENDIX 3

Example of student’s “My learning” rubrics for Geography

gEOFrafija 2. naloga

Apartheid

Postavljanje ciljev
- naučila se bom kaj več o Apartheidu (kaj sploh je, od kdaj do kdaj je trajal, kaj se je v tem obdobju dogajalo)
- izvedela bom več o Nelsonu Mandeli, njegovem delu in življenju
- izvedela bom zakaj je bil Nelson Mandela zaprt in kako je prišel iz zapora
- izvedela bom kaj več o človeku, ki je začel to obdobje
- poizvedela bom kateri ljudje so bili za konec tega obdobja pomembni

Predznanje
- vem že nekaj o Nelsonu Mandeli
- vem, da je bil Apartheid obdobje, ki je bilo za ljudi črme rase zelo grozno

Strategije
- na internetu bom poiskala bom podatke o Apartheidu in o dogajanjih med tem obdobjem
- poiskala bom informacije o Nelsonu Mandeli (o njegovem življenju, delu)

Dokazi
- imela bom več znanja
- vedela bom več o Nelsonu Mandeli in o Apartheidu
- še me bo kdo vprašal kaj o tem obdobju mu bom znala razložiti

Samoevalvacija
- ta naloga se mi je zdela res zanimiva zato sem se vanjo tuši zelo poglajila
- mislim, da sem podatke lepo povezala v celoto saj mi je to vzelo kar nekaj časa
- ob pisanju sem se veliko naučila, kar mi je zelo všeč
- z mojim opisom Apartheidu sem zelo zadovoljna
APPENDIX 4

Example of student’s “My learning” rubrics for English

angleščina 3. naloga
black is beautiful

Postavljanje ciljev
- naučila se bom mnenja pisati tudi v angleščini
- v angleščini bom znala bolje pisati tudi besedila, ki niso tako enostavna

Predznanje
- angleščina mi gre kar dobro
- podobno besedilo smo imeli za nalogo pri geografiji (zato imamo že nekaj podatkov o tej temi)

Strategije
- vadila bom pisanje angleščine saj včasih pozabim, kako se določene besede napišajo
- še enkrat bom prebrala besedilo, ki sem ga napisala za geografijo in bom verjetno izvedela še kakšen nov podatek

Dokazi
- besedilo je berljivo in se da razumeti blistvo
- napak je malo

Samoevalvacija
- mislim, da sem napisala precej dober spis o ojem mnenju o črnih rasi
- imela sem manjše težave s pisanjem nekaterih besed a se na srečo to ni zgodilo pogosto
- mislim, da sem zajela blistvo in upam, da je moje besedilo razumljivo
- z moje nalogo sem zadovoljna
APPENDIX 6

Example of a student’s presentation for Geography (Apartheid) in Mahara

**GEOGRAFIJA·APARTEID**


APPENDIX 7

Example of student’s presentation for English (Black is beautiful) in Mahara

**ANGELŠČINA·BLACK IS BEAUTIFUL**

Black is beautiful is a cultural movement that was started in the United States of America in the 1960's by African Americans. It later spread to much of the black world, most prominently in the writings of the Black Consciousness Movement of Steve Biko in South Africa. It aims to dispel the notion in many world cultures that black people's natural features such as skin color, facial features and hair are inherently ugly. John Sweat Rock was long thought to be the first to coin the phrase "black is beautiful"—during a speech in 1858—but historical records indicate he never actually used the specific phrase on that day. The movement also encouraged men and women to stop trying to eliminate African-identified traits by straightening their hair and attempting to lighten or bleach their skin. It wasn't right, because white people were insulting and hitting black people. Whites were so strict, so they put blacks in jail. They put Nelson Mandela in the jail too. But when he came out he became confederate of the blacks. So what I'm trying to tell, it's that whites shouldn't do that things, because it's all wrong.
**13 GEOGRAPHY: Problems of the modern world**

Marjetka Čas, Primary school Gustava Šiliha Laporje

<table>
<thead>
<tr>
<th>Subject</th>
<th>Geography</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Design Title</td>
<td>PROBLEMS OF THE MODERN WORLD</td>
</tr>
<tr>
<td>Year group</td>
<td>Grade 8 (average age: 13–14 years)</td>
</tr>
<tr>
<td>Language</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Duration</td>
<td>Three lessons</td>
</tr>
</tbody>
</table>

**Goals**

- Students:
  - familiarise themselves with the current problems of the modern world,
  - analyse case studies,
  - identify the causes and consequences of these problems,
  - evaluate meaningful solutions to problems,
  - develop the ability to plan, assess and evaluate their own progress, document their own progress,
  - develop critical thinking, in particular self-reflection,
  - develop skills of cooperation and communication (cooperative learning, live communication, communication with ICT).

**Concise description of the content**

By discussing the theme *Problems of the Modern World* we want to sensitise students for the knowledge, understanding and appreciation of current problems of the modern world, with an emphasis on their finding solutions for them.

By using ePortfolio students develop their ability to plan, monitor and evaluate their own progress. Their skills are built on a basis of reading a selected range of books and electronic resources, which they use to extract relevant data and write them in the PowerPoint presentation using keywords. Students make their learning plans – they create a set of learning objectives and plan appropriate strategies for achieving those objectives.

They express their understanding of the topic by creating a PowerPoint presentation and with persuasive oral performance in the classroom.

To make the knowledge more sustainable, students form cooperative groups to carry out cross-examination questions about the theme at various levels of taxonomy.

Formative assessment plays a special role, as we observe students’ knowledge; students plan, monitor, evaluate and document their own progress with their own personal learning goals. They express motivation for learning within the online learning environment Mahara that becomes also as a kind of a new social network through which students make ‘friends’. The role of ePortfolio is most distinctive in developing skills of distance cooperation and communication in terms of quality feedback among students themselves as well as between students and teachers. The knowledge acquired in this way of work is certainly longer lasting. Students develop important key competences of lifelong learning.
**Keywords**
feedback, peer assessment, active learning, interdisciplinary linking

**Methodology**
Individual work, group work and work in pairs

| 21st century skill(s) | Cooperation, communication and teamwork  
Students develop skills of cooperation and communication in terms of feedback, critical friendship, which are developed through collaborative learning.  
Responsibility to obtain their own knowledge and to learn about active methods which help students to gain more sustainable knowledge more efficiently  
Students:  
· are aware of their own knowledge in relation to the problems of the modern world on basis of the current problems in Africa,  
· formulate a learning objective set in the explanatory personal form,  
· seek strategies for their own learning,  
· plan their strategies for achieving the objectives,  
· work through experience and design expertise,  
· gather evidence of their own learning and knowledge.  
Critical thinking and, in particular, self-reflection  
Students:  
· develop metacognitive skills,  
· make self-reflection of the entire learning process.  
Skills and techniques to enable students to use Mahara and similar software  
Students develop skills of critical thinking with self-analysis, reflect on the entire process, plan improvements ... according to the ePortfolio code. |

**ICT tools used**
Mahara – (tabs My learning, Forums, Views)

**Students’ activities**
Part 1: Students plan the process of learning  
Plan and design learning in Mahara software (‘My learning’ tab). Students fill out the forms of the phases named ‘Prerequisites’ and ‘Setting goals’. As an assisting tool, students may also use the materials, texts and images, prepared in ePortfolio.  

a) Students activate their prior knowledge about the theme Problems of the modern world by brainstorming and extracting the most critical problems. They choose a topic problem that will be investigated.  
b) Students plan their personal goals. From the set of targets to choose from, they select the most important ones for them and record the information in the ePortfolio.  
c) Students plan strategies to achieve goals while considering the activities that will lead them towards achieving the set goals. The strategies get recorded in the ePortfolios. They compare their strategies with their classmates’ objectives and provide peer-feedback.  
d) Students co-create the criteria on basis of which the product will be evaluated.
Part 2: Learning process
a) Pupils make meaningful statements from various books and online resources and create a PowerPoint presentation. Pupils write down keywords or phrases. In the introduction, the students write down goals and purpose, define the research question or the hypothesis; in the core they analyse the problem (causes, consequences, solutions); in conclusion they sum up the findings and support or reject the hypothesis. At the end they add a reference list of the resources. Participation is included in the peer evaluation criteria. Students deliver their PowerPoint presentations. They get feedback from classmates.

b) After the presentation students answer classmates’ and teacher’s questions.

Part 3: Evaluation
a) The ePortfolio recorded evidence of their learning.

b) The teacher moderates discussion about the PowerPoint presentations in a “round table”, asks questions, and together with pupils evaluates the presentation against the criteria. Pupils provide peer feedback.

c) Students write the final self-reflections on the lessons learned while addressing the problems of the modern world tracked and recorded in the ePortfolio. Students complete a report on their learning in Mahara: learning strategies, self-evaluation and learning evidence.

Accompanying materials/resources for the learning design

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>File name / URL</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria rubrics for the preparation of presentations</td>
<td>Document</td>
<td>Appendix 1</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Students share the views that enable them to express feedback on the evidence for each other.</td>
<td>Web link to Mahara, Scan of interface in Mahara</td>
<td><a href="https://listovnik.sio.si/">https://listovnik.sio.si/</a></td>
<td>Slovenian</td>
</tr>
<tr>
<td>List of the problems of the modern world, that students investigated</td>
<td>Word document – link to Mahara</td>
<td>Appendix 3</td>
<td>Slovenian</td>
</tr>
</tbody>
</table>

Examples of good practice: 13 GEOGRAPHY
<table>
<thead>
<tr>
<th>Students’ artefacts</th>
<th>Implementation photos/videos</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Final presentations of learners – evidence</strong></td>
<td>Video of students about work with ePortfolio</td>
</tr>
<tr>
<td>Scan of a product of a student – PowerPoint Evidence in Mahara</td>
<td>Photos of students</td>
</tr>
<tr>
<td><strong>Final presentations of learners - evidence</strong></td>
<td><strong>Evidence of completion of the assignment - given feedback (teacher) and peer feedback</strong></td>
</tr>
<tr>
<td>Scan of a product of a student – PPT Evidence in Mahara</td>
<td><strong>Evidence of completion of the assignment – given feedback (teacher) and peer feedback</strong></td>
</tr>
<tr>
<td><strong>Evidence of completion of the assignment - given feedback (teacher) and peer feedback</strong></td>
<td></td>
</tr>
<tr>
<td>Scan of interface in Mahara</td>
<td></td>
</tr>
<tr>
<td><strong>Students plan and design their own learning by using ‘My learning’ tab in Mahara software.</strong></td>
<td>Feedback od evidence: Sexually Transmitted Diseases in Africa</td>
</tr>
</tbody>
</table>
| Scan of a product of a student (Mahara record). | | **http://url.sio.si/prevod_valitveni_vide** | Slovenian

136
# Teacher’s reflection on the results and the lessons learnt

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What went well</strong></td>
</tr>
<tr>
<td>Cooperative learning in pairs or groups in which students were actively involved and responsibly took on their roles, developing the art of cooperation and communication (live and on-line communication) worked out most successfully. To a large extent students’ literacy skills were enhanced as they used various reading and learning strategies, such as searching for key information from different sources. Students developed critical thinking skills through self-analysis. They reflected on the whole learning process and planned improvements according to the ePortfolio code.</td>
</tr>
<tr>
<td>Integration of formative assessment to address the problems in the field of geography is a very effective approach, as it allows greater active involvement of students in all stages of education. It increases students’ motivation and their responsibility for their own learning and achievements. Cooperation with peers, peer learning and feedback information has proved to be most encouraging. By using ePortfolio learners can explore a particular problem of their own choice and plan their working strategies. As a teacher, I can monitor progress of each student. Such approach can be transferred to other topics and subject areas, e.g. history, because it is efficient and up-to date.</td>
</tr>
<tr>
<td><strong>What did not go well</strong></td>
</tr>
<tr>
<td>The initial obstacles: mainly poor knowledge on how Mahara works and my weakness in giving quality and in-depth feedback. Later the quality of feedback was improved, because we used the ‘Sandwich approach’ and related the feedback to the learning objectives.</td>
</tr>
<tr>
<td>We did not achieve all the desired goals. Nevertheless, it isn’t the goal, it’s the path itself, which is the most important.</td>
</tr>
<tr>
<td>One of the possible disadvantages of formative assessment is monitoring students without their feeling involved in the process itself. I myself always try as much as possible to involve students as well. The disadvantages of working with ePortfolio compared with its benefits are negligible. They are mainly of technical nature, such as lack of adequate ICT equipment, and even that is gradually improving.</td>
</tr>
<tr>
<td><strong>Lessons learnt</strong></td>
</tr>
<tr>
<td>The most important achievement of this lesson is the development of students’ (self-) evaluation skills in terms of (self-)regulation, ie. planning (designing their own learning objectives), choosing the strategies to achieve the objectives, choosing the activities, monitoring and evaluating their own progress, because in this way they proved that they can take responsibility for their own learning.</td>
</tr>
<tr>
<td>The students showed great knowledge, which they discussed with confidence and in a variety of formats.</td>
</tr>
<tr>
<td>Students became efficient in working with ePortfolio in Mahara. All subsequent lessons were increasingly more effective, time-saving, and technical problems were fewer and fewer. Students became Mahara tutors to one another, as well as to younger lower grade students.</td>
</tr>
</tbody>
</table>
APPENDIX 1

Criteria rubrics for the preparation of presentations

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vsebinska zasnova</td>
<td>PPT is visually attractive and engaging.</td>
<td>PPT is unengaging and visually monotone.</td>
</tr>
<tr>
<td>Oblikovanje</td>
<td>PPT is visually attractive and engaging.</td>
<td>PPT is unengaging and visually monotone.</td>
</tr>
<tr>
<td>Viri</td>
<td>Information is presented clearly and logically.</td>
<td>Information is presented in a confusing manner.</td>
</tr>
<tr>
<td>Jezik</td>
<td>Language is clear and concise.</td>
<td>Language is unclear and difficult to follow.</td>
</tr>
<tr>
<td>Predstavitelj</td>
<td>Presentation is well-structured and logically presented.</td>
<td>Presentation is poorly structured and difficult to follow.</td>
</tr>
</tbody>
</table>

APPENDIX 2

Example of students’ feedback on the evidence to each other
APPENDIX 3

List of the problems of the modern world investigated by students

1. Poverty and famine in the Sahel
2. Maori and their culture today
3. The disappearance of islands in Oceania
4. Extreme weather conditions in Central America
5. Nuclear test in Oceania
6. Problems in polar regions
7. Problems of Aboriginal
8. Islamic terrorism
9. The spread of the Sahara
10. Sexually Transmitted Diseases in Africa
11. Deforestation of the Amazon
12. Threats to the Great Barrier Reef
13. Problems in the transport links of Australia
14. Urban expansion in South America
15. The problems of Indians in North America
16. The extinction of animal species in Australia
APPENDIX 4

Examples of students’ final presentations

[Images of presentation slides with titles in different languages]
APPENDIX 5

Evidence of completion of the assignment – teacher and peer feedback
APPENDIX 6

Example of a student's learning plan

PROBLEMI SODOBNEGA SVETA

Obravnavali bomo aktualne probleme sodobnega sveta.

Postavljanje ciljev
- Spoznala bom probleme Južne Amerike,
- analizirala bom vzroke problemov, ki se navezujejo na širjenje kriminalnem mest,
- predlagala bom rešitve,
- izdelala bom kvalitenen ppt

Predznance
Vem, da je v Južni Ameriki velik problem kriminal, predvsem mafi, ki je zelo nevarna.

Strategije
- Iскala sem spletno in knjižni vir
- izuščila sem pomembne podatke

Dokazi
- Narejen ppt,
- pridobila bom nova znanja,
- seznanila sem se z največjimi problemi sodobnega sveta,
- polskala sem vzroke, posledice in rešitve posebnega problema,
- spoznala, kako se pravilno citirajo viri.

Samoevalvacija
- Všeč mi je bilo, ker smo delali v šoli;
- všeč mi je bilo, saj sem raziskovala zanimive probleme;
- spoznala sem probleme sodobnega sveta;
- lahko bi imeli več časa za izdelavo in pripravo govora pri PPT-ju;
- izdelala sem kvaliteten PPT.
APPENDIX 7

Evidence of completion of the assignment – teacher and peer feedback

Examples of good practice: 13 GEOGRAPHY
14 MATHEMATICS: Using Math/finding Math in everyday life

Mojca Novoselec, High School for Cosmetics, Pharmacy and Health, Ljubljana

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mathematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Design Title</td>
<td>USING MATH / FINDING MATH IN EVERYDAY LIFE</td>
</tr>
<tr>
<td>Year group</td>
<td>High school, Grade 3 (average age: 17–18 years)</td>
</tr>
<tr>
<td>Language</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Duration</td>
<td>October – December 2014</td>
</tr>
<tr>
<td>Goals</td>
<td>Students:</td>
</tr>
<tr>
<td></td>
<td>· connect the learning goals with facts outside the class,</td>
</tr>
<tr>
<td></td>
<td>· see the usefulness and importance of math,</td>
</tr>
<tr>
<td></td>
<td>· observe their math progress by saving their evidence of learning in Mahara,</td>
</tr>
<tr>
<td></td>
<td>· communicate in the Mahara learning environment,</td>
</tr>
<tr>
<td></td>
<td>· learn to use new learning environment.</td>
</tr>
<tr>
<td>Concise description of the content</td>
<td>Students find and describe the facts learned at school in everyday life. They prepare different presentations (PowerPoint, Prezi etc.). They create their own math problems and reflect on what is important and what not. Then they prepare for the final exams (theory).</td>
</tr>
<tr>
<td>Keywords</td>
<td>Mahara, geometric shapes</td>
</tr>
<tr>
<td>Methodology</td>
<td>individual work or in pairs</td>
</tr>
<tr>
<td></td>
<td>Mahara is used at school during regular hours.</td>
</tr>
<tr>
<td>21st century skill(s)</td>
<td>creativity, communication</td>
</tr>
<tr>
<td>ICT tools used</td>
<td>computers, smart phones, digital cameras</td>
</tr>
</tbody>
</table>
1. After discussing plain geometrical shapes (for almost two months) and their characteristics, we look for basic geometrical objects on the web (www.e-um.si). I invite students to take their smart phones and go around the school building. I give them 15 minutes to find and take a photo of some shapes they can find. Absent students can take photos on their way home at some other opportunity.

2. We make an account in Mahara and create ‘Matavantura’: I ask them to write down some words about their life and goals to introduce themselves. They make a diary note.

3. We open ‘My learning’: Geometric shapes and together we fill in the gaps (because they think they do not have any knowledge so far). Referring to students’ previous knowledge increases their motivation (Appendix 1, 2 and 3).

4. Students create their profiles and set their photos in Mahara.

5. Together we set their photos from activity 1 to Mahara (Appendix 4).

6. Everyday work and learning in class (books, notebooks).

7. Students make a conclusion in ‘My learning’ tab and reflect on their test grades.

Other

In January the work in Mahara will be connected to the topic entrepreneurship. Work in Math will continue on the field of functions.

Website

Mahara

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**Accompanying materials/resources for the learning design**

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>File name/URL</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials during activities</strong></td>
<td>Instructions</td>
<td></td>
<td>Slovenian</td>
</tr>
<tr>
<td>Books,</td>
<td>Web page e-um.si</td>
<td><a href="http://www.e-um.si">www.e-um.si</a></td>
<td></td>
</tr>
<tr>
<td>Wire models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Students’ artefacts</strong></td>
<td>Photos</td>
<td></td>
<td>Slovenian</td>
</tr>
<tr>
<td>Word document</td>
<td>My learning in Mahara</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Implementation photos/videos</strong></td>
<td>Digital photos</td>
<td></td>
<td>Slovenian</td>
</tr>
</tbody>
</table>
## Teacher’s reflection on the results and the lessons learnt

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What went well</strong></td>
<td>Taking photos, arranging Mahara, connecting with student’s career interests.</td>
</tr>
<tr>
<td><strong>What did not go well</strong></td>
<td>Too much Math theory. They are not coping well with Math and therefore it is hard for them to connect theory and practice.</td>
</tr>
<tr>
<td><strong>Lessons learnt</strong></td>
<td>Mahara should stay fun, it’s not to be overused; can be used as a supplement. My learning is useful as it shows at the beginning that students have some prior knowledge from primary school, and then at the end they can look back and see what was done. Students’s reflection on their results is very precious.</td>
</tr>
</tbody>
</table>
APPENDIX 1

Some words about me in ‘My learning’ – Geometrical shapes
APPENDIX 2

Some words about me in ‘My learning’ – Geometrical shapes
APPENDIX 3

Example of a student's learning plan – Geometrical shapes

MATHEMATICS - GEOMETRIC SOLIDS

Setting of goals
1. In all living and mathematical situations, recognize:
   - cuboid
   - cube
   - prism
   - cone
   - pyramid
   - sphere
2. Find which is the volume of a solid.
3. Find which is the surface area of a solid.
4. Solve a problem with solid surfaces and surfaces.

Objectives

Around you, in your environment, I know how to search for simple examples of solids.

Strategies
1. Watch and draw models of solids (from a wire).
2. Use the solid.
3. Solve a problem with the solid.

Proofs

 בהם İz test (I hope you are satisfied).

Self-evaluation

I was 4, and I am very satisfied 😊

SPA

Published by Matjaž Vajda on 14. March 2014, 0:59
APPENDIX 4

Examples of photos of geometrical shapes taken by students

Geometrical shapes at school

Geometrical shapes at home
# 15 HISTORY:
Traces of Roman influence on the Slovenian territory

**Mitja Turk**, High School Grm, Novo mesto

<table>
<thead>
<tr>
<th>Subject</th>
<th>History</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning Design Title</strong></td>
<td>TRACES OF ROMAN INFLUENCE ON THE SLOVENIAN TERRITORY</td>
</tr>
<tr>
<td><strong>Year group</strong></td>
<td>Grammar School, Grade 1 (average age: 15 years)</td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td>Slovenian</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>45-minute lesson in the computer room + 45-minute lesson in the regular classroom</td>
</tr>
<tr>
<td><strong>Goals</strong></td>
<td>Students:</td>
</tr>
<tr>
<td></td>
<td>· use a variety of historical sources to describe some of the Roman cultural monuments on the territory of today’s Slovenia,</td>
</tr>
<tr>
<td></td>
<td>· determine the appropriate time and space the selected historical monuments belong to,</td>
</tr>
<tr>
<td></td>
<td>· develop skills of collecting, selecting and critically assessing the value and usefulness of images available on the World Wide Web.</td>
</tr>
<tr>
<td><strong>Concise description of the content</strong></td>
<td>The purpose of the lesson is to learn about the Roman cultural heritage on the territory of today’s Slovenia. Students get a worksheet with eight cultural monuments (via e-mail) that are inadequately described (just the name of the discovery, a photograph or a description of the findings). Students complete the worksheet by using the Internet where they find the appropriate sources and the missing information. They must consider the credibility of the images from various online sources, cite the sources correctly and describe the monument. Students fill out an AfL tab during the lesson. After they complete their worksheets, they load them into Mahara. They send their worksheets to the teacher who prints them out by the next lesson. Students work in pairs and talk about what they have learnt during the lesson.</td>
</tr>
<tr>
<td><strong>Keywords</strong></td>
<td>using sources, using the Internet</td>
</tr>
<tr>
<td><strong>Methodology</strong></td>
<td>individual work</td>
</tr>
<tr>
<td><strong>21st century skill(s)</strong></td>
<td>ICT skills, digital literacy, critical thinking</td>
</tr>
<tr>
<td><strong>ICT tools used</strong></td>
<td>Mahara – a fully featured web application to build your ePortfolio</td>
</tr>
</tbody>
</table>
### Students’ activities

- Students:
  - fill out ‘My learning’ tab,
  - fill out the worksheet:
    - insert appropriate illustrations or photos,
    - cite sources properly,
    - describe historical monuments,
    - indicate the sites,
    - indicate the time of occurrence/date of origin,
    - describe the characteristics of the findings,
    - recognise the importance of Roman finds as an integral part of the cultural heritage of Slovenia,
  - check the worksheets during the lesson,
  - sum up the learning results and process through interaction,
  - reflect upon their achievements – they complete at least one the following sentences: *The hardest part was ...; Now, when I have filled out the worksheet, I understand ...; I was surprised ...; I enjoyed the process, because ...*

### Other

### Website
## Accompanying materials/resources for the learning design

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>File name / URL</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials during activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>'My learning' tab</td>
<td>A tab in the on-line ePortfolio (Mahara)</td>
<td></td>
<td>Slovenian</td>
</tr>
<tr>
<td>An AfL tab in Mahara, where students plan their own learning (teacher can comment on it) with the help of the following questions:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Setting the goals</strong></td>
<td>What is my goal? What do I want to achieve?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prior knowledge</strong></td>
<td>What do I already know? What can I already do?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Strategies</strong></td>
<td>How can I achieve my goal?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>How will I prove that I have achieved the goal?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Self-evaluation</strong></td>
<td>How successful have I been? Have I reached my goal?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empty worksheet</td>
<td>Appendix 2</td>
<td>Slovenian</td>
<td></td>
</tr>
<tr>
<td>Success criteria for the worksheet evaluation</td>
<td>Appendix 3</td>
<td>Slovenian</td>
<td></td>
</tr>
<tr>
<td><strong>Students’ artefacts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A student’s learning plan</td>
<td>An AfL tab in Mahara, where students plan their own learning</td>
<td>Appendix 1</td>
<td>Slovenian</td>
</tr>
<tr>
<td>Evidence</td>
<td>Student’s worksheets filled with required information</td>
<td></td>
<td>Slovenian</td>
</tr>
<tr>
<td><strong>Implementation photos/videos</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Teacher’s reflection on the results and the lessons learnt

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
</table>
| **What went well** Students:  
  • were very excited to work with the selected resources (and computers),  
  • gained basic knowledge about how to search for historical sources on the internet,  
  • felt responsible for the quality of the materials and their knowledge,  
  • were motivated for this kind of work (though not very highly motivated). |
| **What did not go well** Students:  
  • needed a lot of help and suggestions when creating their learning plans,  
  • were mostly satisfied with the brief descriptions and findings in an AFL tab in Mahara, where they planned their own learning,  
  • were reluctant to fill in the formative assessment sheet,  
  • had difficulties in using the Mahara application – e.g. they were unable to upload attachments.  
  
  Teacher also faced various technical problems using the Mahara application. |
| **Lessons learnt** Teacher should:  
  • encourage interaction among students,  
  • encourage students to use the success criteria in order to improve their worksheets,  
  • provide timely feedback on what the students did well and what could have been done better,  
  • encourage further progress of students’ ICT skills. |
APPENDIX 1

Example of a student’s learning plan

**POMEMBNEJŠE NAJBRE NA TLEH DANAŠNJE SLOVENIJE**

**Postavljanje ciljev**
- Zvedeti želimo najdete, ki so jih našli pri nas
- Navajali veri
- Iskanje ustreznih informacij
- Iepo oblikovati delovni list

**Predznanje**
- Znam iskati po internetu
- Znam "približno" navajati vire

**Strategije**
- Delo z internetom
- Znašla se bom 😊

**Dokazi**
- Izpolnjen delovni list

**Samoevalvacija**
Zdi se mi, da sem bila zelo uspešna, saj mi je uspelo narediti čudovit delovni list
APPENDIX 2

Empty worksheet

<table>
<thead>
<tr>
<th>Najdite</th>
<th>Sempeter v Savinjski dolini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Najdišče</td>
<td></td>
</tr>
<tr>
<td>Čas</td>
<td></td>
</tr>
</tbody>
</table>
| Značilnosti | Rimska utrdba Ad Pirum leži na poti rimske ceste, ki je vodila iz Aquileje (Oglej) čez Hrušico v Emono (Ljubljana). Če je bila zgrajena v času cesarja Avgusta, ko je bilo področje sedanje Slovenije vključeno v rimski imperij.
APPENDIX 3

Success criteria for the worksheet evaluation

<table>
<thead>
<tr>
<th>VSEBINA</th>
<th>😊</th>
<th>😞</th>
<th>😩</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poisče in izbere</td>
<td>Poisče in izbere</td>
<td>Poisče in izbere</td>
<td></td>
</tr>
<tr>
<td>ustrezne podatke</td>
<td>pretežno ustrezne</td>
<td>podatke v s pomočjo</td>
<td></td>
</tr>
<tr>
<td>s pomočjo interneta.</td>
<td>podatke s pomočjo</td>
<td>interneta.</td>
<td></td>
</tr>
<tr>
<td>Vkijučena so vsa</td>
<td>Vkijučena je večina</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pomembna</td>
<td>pomembnih</td>
<td></td>
<td></td>
</tr>
<tr>
<td>zgodovinska dejstva.</td>
<td>zgodovinskih dejstev.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VIRI</th>
<th>😊</th>
<th>😞</th>
<th>😩</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navajanje virov je</td>
<td>Navajanje virov je</td>
<td>Navajanje virov je</td>
<td></td>
</tr>
<tr>
<td>ustrezno.</td>
<td>pretežno ustrezno.</td>
<td>popolnoma ali pretežno</td>
<td></td>
</tr>
<tr>
<td>Kritično izbira vire</td>
<td></td>
<td>neustrezno.</td>
<td></td>
</tr>
<tr>
<td>in informacije.</td>
<td></td>
<td>Vire in informacije</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>izbira nekritično.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TERMINOLOGIJA</th>
<th>😊</th>
<th>😞</th>
<th>😩</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uporaba pojmov in</td>
<td>Uporaba pojmov in</td>
<td>Uporaba pojmov in</td>
<td></td>
</tr>
<tr>
<td>strokovne terminologije je</td>
<td>strokovna terminologija</td>
<td>strokovna terminologija</td>
<td>pretežno ustrezna.</td>
</tr>
<tr>
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