

HOW TO DEVELOP THE NEXT STAGE TEACHERS CONTINUOUS PROFESSIONAL DEVELOPMENT MODEL: ICT IN SCIENCE AND MATH TEACHING/LEARNING PROCESS

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Situācijas analīze

- Veikti projekti pmsk un vidusskolai: iekārtas, ierīces, atbalsta materiāli
- Organizēta skolotāju profesionālā pilnveide

Situācijas analīze

	I stage	II stage
ICT tools and resources	<p>To acquire the technical skills to use various tools:</p> <ul style="list-style-type: none"> - data loggers, sensors, interactive whiteboard, web camera, data camera <p>Teachers identify the resources available for the organization teaching/learning process in science and math:</p> <ul style="list-style-type: none"> - videos, virtual labs, animations etc. 	<p>To use developed teaching materials with use of ICT tools and resources in teaching/learning process (mostly in Latvian):</p> <ul style="list-style-type: none"> - lesson plans - Worksheet for virtual labs etc. <p>To learn from other colleagues 'good practice' examples.</p> <p>Students identify the resources available for learning process in science and math:</p> <ul style="list-style-type: none"> - videos, virtual labs, animations etc.
The aim of teaching	<p>A knowledge transfer model</p> <p>To use ICT in teaching/learning process</p> <ul style="list-style-type: none"> - for visualization - to present students with content - to deliver information 	<p>Support system model</p> <p>To develop and enhance ICT skills to organize teaching/learning process:</p> <ul style="list-style-type: none"> - planned with purpose meaning - to engage students with content - to facilitate collaboration during lessons and beyond

RESEARCH QUESTIONS:

- How meaningful use of ICT tools were in science and math teaching/learning process?
- What information teachers do CPD course developers obtain?

METHODOLOGY OF RESEARCH

- 2013 - 1014
- 10 schools from the same municipality
- 64 science subject lessons (physics, biology, chemistry; grades 7 – 12)

METHODOLOGY OF RESEARCH

Data collection and analysis:

- Lesson observation and analysis
- Analysis of Experts feedback

- Professionally trained experts from the Center for Science and Mathematics Education (10 – 15 years experience)

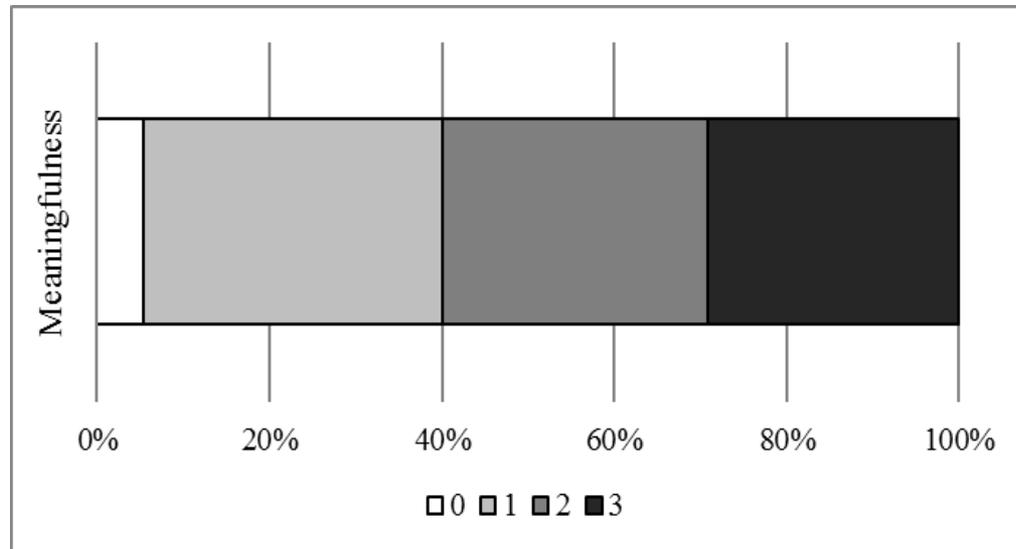
METHODOLOGY OF RESEARCH

Data collection and analysis:

- Specially developed e-observation sheets for transcript and analysis
- Rubric: use of ICT for Learning

RESULTS

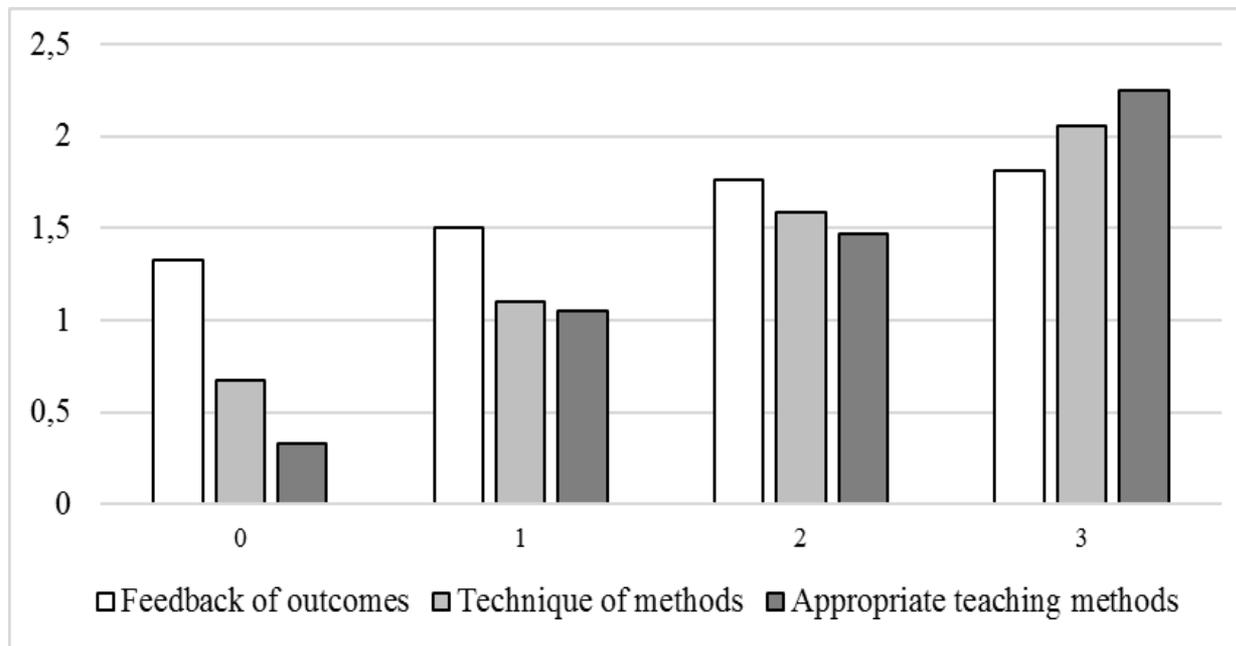
Meaningfulness of ICT tools use in observed science lessons



0 – not present; 1 – minor presence; 2 – moderate presence; 3 – present

RESULTS

The correlation between the use of ICT and implemented teaching methods



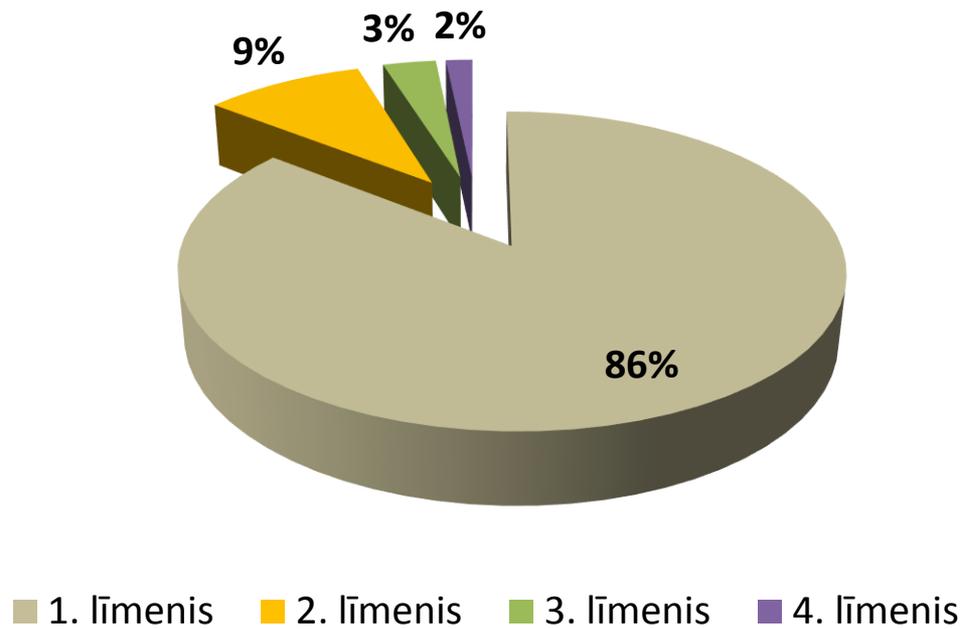
0 – not present; 1 – minor presence; 2 – moderate presence; 3 – present

RUBRIC: USE OF ICT FOR LEARNING

Level	Criteria
1	Students do not have the opportunity to use ICT for this learning activity
2	Students use ICT to learn or practice basic skills or reproduce information. They are not constructing knowledge.
3	Students use ICT to support knowledge construction BUT they could construct the same knowledge without using ICT.
4	Students use ICT to support knowledge construction. AND the ICT is required for construction this knowledge. BUT students do not create an ICT product for authentic users.
5	Students use ICT to support knowledge construction. AND the ICT is required for construction this knowledge. AND students do create an ICT product for authentic users.

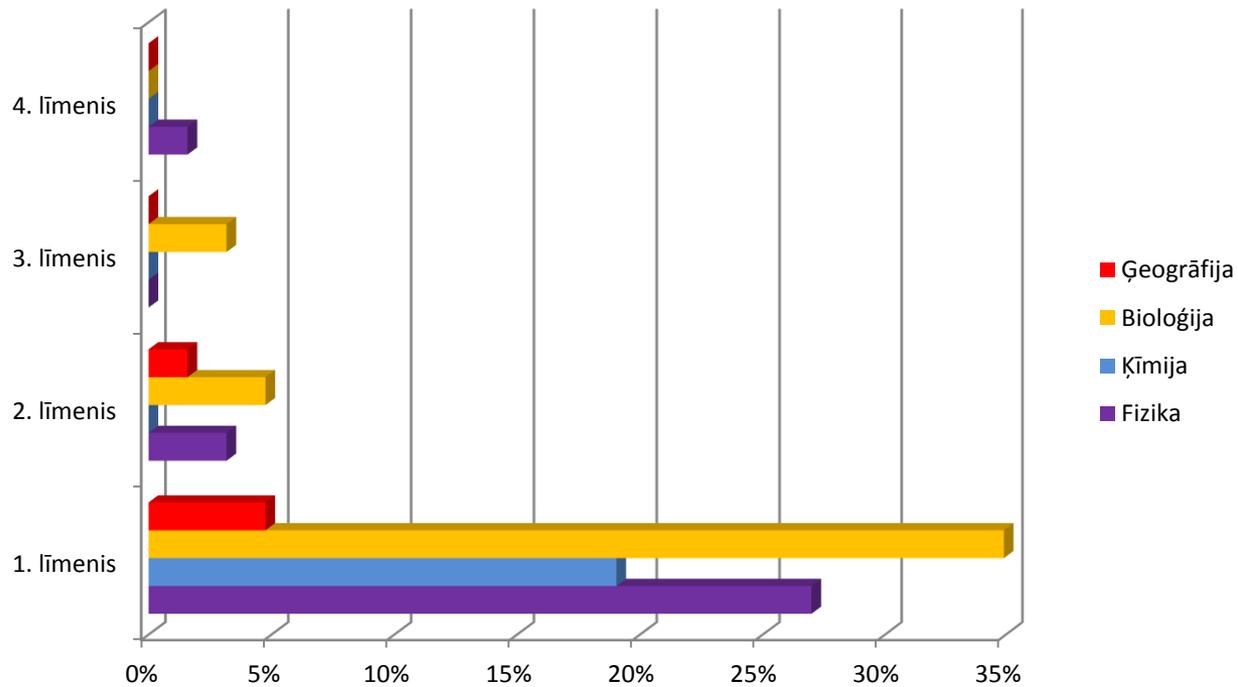
RESULTS

Use of ICT for learning



RESULTS

Use of ICT for learning



Discussion and conclusions

1. Nelieta jēgpilni – 40% novērotās stundas IKT netiek izmantots jēgpilni
2. Stundās, kuras tiek plānotas mērķtiecīgi, arī IKT lietojums ir mērķtiecīgs
3. Vairumā gadījumu novēroto stundu (86 %) skolēniem vispār netiek piedāvāts lietot IKT
4. Ja skolēni lieto IKT, tad pamatā, lai trenētu pamatprasmes un reproducētu informāciju
5. Skolotājiem jāpiedāvā jauna tipa tālākizglītības kursi

Discussion and conclusions

	III stage
ICT tools and resources	<p>To acquire the technical skills to use ICT tools for personalized learning (tablets, mobile phones, digital platforms etc.)</p> <p>To identify and acquire new generation ICT education tools and resources for CPD, for example:</p> <ul style="list-style-type: none">- Learning Designer (http://learningdesigner.org)- InstaGrók (https://www.instagramrok.com) etc.
	Deeper learning model
The aim of teaching	<p>To design own lessons with meaningful use of ICT tools and resources in teaching/learning process:</p> <ul style="list-style-type: none">- to encourage students to think in new ways, to persist in the face of challenges- to help students actively construct knowledge, to solve complex problems- to encourage students to communicate effectively, to work well in teams- to develop student`s skills to monitor and direct their own learning

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