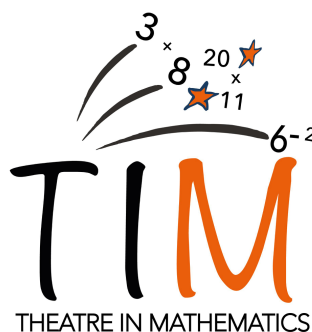


Co-funded by the
Erasmus+ Programme
of the European Union



Erasmus+ Programme
KA2 – Cooperation for Innovation and Exchange of Good Practices
KA201 - Strategic Partnership for school education

Project Number: 2018-1-IT02-KA201-048139
CUP: F29B18000170006

First TIM Multiplier Event **National Conference in Greece**

Proceedings

Deliverable DE1.1

Chania, Greece, October 23rd 2019
Mikis Theodorakis Theatre

Hosting Institution: TUC



1 INDEX OF CONTENT

1	INDEX OF CONTENT	1
2	PREFACE	2
3	ACKNOWLEDGEMENT	3
4	EVENT INTRODUCTION	4
5	SLIDES	5
5.1	PROJECT CONSORTIUM - COREP	5
5.2	PROJECT OVERVIEW	9
5.3	PROJECT CONSORTIUM - HVL	16
5.4	PROJECT CONSORTIUM - TUC	19
5.5	PROJECT CONSORTIUM - DOORS	23
5.6	PROJECT CONSORTIUM - ASTA	24
5.7	PROJECT OUTPUTS – O1 – TIM METHODOLOGY MANUAL	26
5.8	PROJECT OUTPUTS – O2 – E-LEARNING PLATFORM	32
5.9	PROJECT OUTPUTS – O3 – THEATRICAL CONFERENCE	37
5.10	PROJECT OUTPUTS – O4 – SCIENTIFIC PUBLICATIONS	41
5.11	PROJECT OUTPUTS – ASSESSMENT FRAMEWORK	45
5.12	MATHEMATICS EDUCATION IN THE 21 ST CENTURY	48
5.13	THEATRE IN EDUCATION	60
5.14	TEACHING EQUATIONS WITH ROLE PLAYING GAMES	71



2 PREFACE

The following presentation contains the contributions presented at the First TIM Multiplier Event National Conference held on the 23rd of October 2019 in Chania, Greece.

The Event has been developed in the context of the activities of the TIM project "Theatre in Mathematics", funded with the support of the Erasmus+ programme of the European Commission, Key Action 2: Cooperation for innovation and exchange of good practices - Strategic Partnership for School Education.

This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

These proceedings are available on the TIM Moodle Platform.



3 ACKNOWLEDGEMENT

This report, deliverable DE1.1 E1 Chania Multiplier Event - Proceedings was prepared by TUC to report on the Multiplier Event E1 – First National Event organized in Chania, 23 October 2019. All project partners participated in the event and provided presentations of the members of the TIM consortium along with all the expected outputs. These presentation can be found in this deliverable.



4 EVENT INTRODUCTION

This deliverable contains the presentations made during the E1 – First TIM National Event that was organized by TUC in Chania, 23 October 2019.

The event followed the schedule decided by the by the Management Board and included presentations about the aim, objectives, outputs and workplan of the project, presentations by experts on Mathematics Education and Theatre in Education, presentations made by teachers employing theatrical approaches in their teaching in Mathematics and open discussion with the participating stakeholders and many teachers in primary and secondary education.

The event also presented the TIM methodology by means of two workshops organized by the Italian partners (Mathemart) and the Norwegian partners (Process Drama).

TUC has exploited its contacts to ensure a wide participation in the event including university professors, decision makers, education managers, and representatives of associations of teachers of Mathematics, representatives of local authorities and public authorities in education, primary and secondary teachers of mathematics.

Another major objective of the event was to present the TIM e-learning platform and invite the participants to use it and, thus, become members of the TIM Community of Practice. In particular, TUC, has set up before the event a “course space” within the platform dedicated to the event, sent information to all registered participants on how to use the platform to access the event materials as well as how to proceed, after the event, on the issue of their certificates. All certificates of participation were issued electronically, via the e-learning platform, and instructions were given to the participants on how they can find and download them.

All participants received printed information about the project and its objectives while all materials used and presented during the event were uploaded and are available via the e-learning platform.

The event was organized one day after the end of the C3 training event that pilot-tested the TIM methodology with children of two age groups: Primary school and Secondary school students. Both the events attracted the attention of local media (newspapers and radio stations) and special articles were devoted to the event and the TIM project.

The following sections contain the slides used by the presenters during the event.



5 SLIDES

5.1 PROJECT CONSORTIUM - COREP

Presentation made by Maurizio Bertolini (COREP) with general information about the Coordinator organization of the project.

UNIVERSITY OF TURIN (Italy)

**Social and Community Theatre
Centre**

Chania - October 23rd, 2019



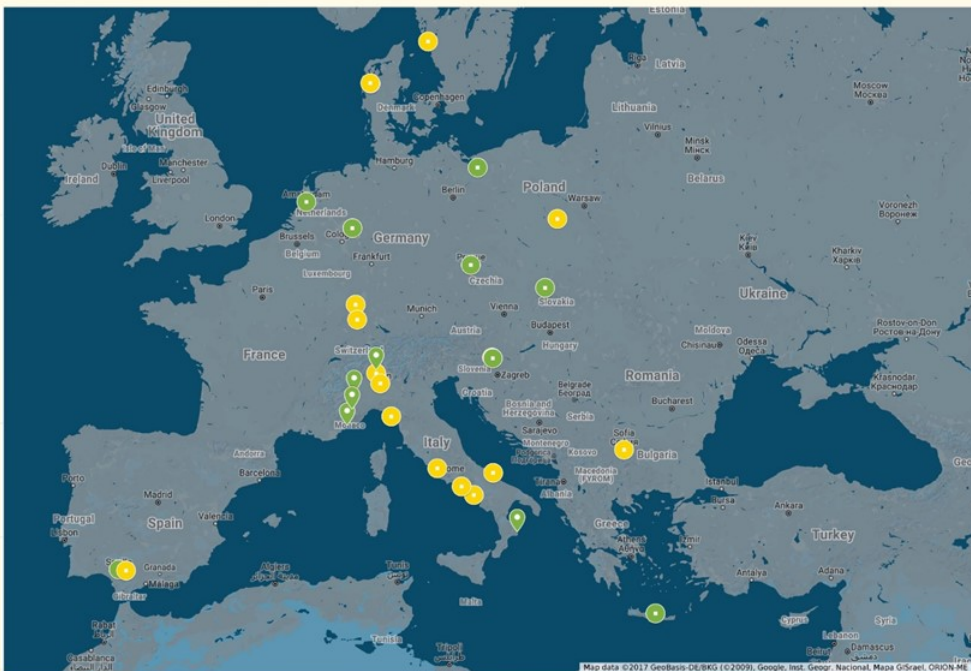


Areas of interventions



SOCIAL COMMUNITY THEATRE CENTRE

SCT Centre in Europe



SOCIAL COMMUNITY THEATRE CENTRE



SCT Centre outside Europe



SCT Methodology

We have our specific methodology that **through theatre** and its creative process **produces** change, empowerment of **life skills**, **growth of the person** and of the relationships between persons and between **groups**

In the field of “Education and training” our methodology is mainly developed through the **social theatre workshop**





Education and training

- Master in Social and Community Theatre (since 2004 – 4 editions)
- Mathemart – teaching mathematics in the theatre workshop (since 2011)
- Social and Community Theatre school (since 2017)
- Training for educators (since 2004)
- Training for nurses (since 2005)
- Training for social entrepreneurs (since 2013)



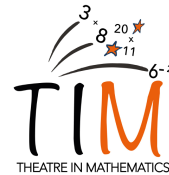
www.socialcommunitytheatre.com

<https://www.facebook.com/socialcommunitytheatre/>

Youtube - [goo.gl/3ujADp](https://www.youtube.com/channel/UC3ujADp)



Co-funded by the
Erasmus+ Programme
of the European Union



5.2 PROJECT OVERVIEW

Presentation made by Maurizio Bertolini (COREP) with general information about the project, its partners, workplan and expected outputs.




TIM – Theatre in Mathematics
Project Number: 2018-1-IT02-KA201-048139

PROJECT OVERVIEW

MAURIZIO BERTOLINI
Corep – SCT Centre

Multiplier event E1

Chania - Greece

Co-funded by the
Erasmus+ Programme
of the European Union 



TIM DATA

Co-funded by the
Erasmus+ Programme
of the European Union



KA2 – Cooperation for innovation and exchange of good practices

Strategic Partnership for school education

CONSORTIUM

- **Italy**
 - **COREP**, Consorzio per la Ricerca e l'Educazione Permanente (coordinator), Torino
 - **ASL TO 3**, DORS, Collegno
- **Norway - HVL**, Western Norway University Of Applied Sciences, Bergen
- **Greece - TUC**, Technical University of Crete, Chania
- **Portugal - ASTA**, AlbiAsta, Covilhã



TIM main objectives

Face the main obstacles in the way of teaching and learning mathematics **providing a new methodology - TIM Methodology** - to teach mathematics, using drama and theatre workshop.

Addressing any context or level of literacy of the students within the **range 8-14 years old**.

The main target group will include **teachers and student teachers**. Secondary target students, schools, universities, Institutions that deals with mathematical education...

TIM outputs

- **O1 TIM - Methodology Manual**
- **O2 TIM - e-Learning platform**
- **O3 TIM - Theatrical conference "The fear of mathematics"**
- **O4 TIM - Scientific Publication**



TIM events

- LTTA - Learning/teaching/training activities
- TPM – Transnational project meetings
- Multiplier events

The workflow

We start sharing the experience gained:

- C1 (LTTA) – December 2018 – Turin – **“Mathemart Sharing”**
- C2 (LTTA) – March 2019 – Bergen – **“Process drama sharing”**



The workflow

We experiment the TIM methodology:

- C3 (LTTA) – October 2019 – Chania – **“TIM pilot - test”**

8

The workflow

We teach and spread the TIM Methodology:

C4 (LTTA) – April 2020 – Covilha – **“TIM training for trainers”**

December 2020 – June 2021. **5 trainers per country** (20 in total) **use the TIM Methodology** in workshops with 20 students and 20 teachers each. In total at least 400 teachers and 400 students are trained within the end of the project.



The workflow

In the meanwhile the theatrical conference

“The fear of mathematics” is being born:

C5 (LTTA) – February 2020 – Turin – **“First session of rehearsal”**

C6 (LTTA) – September 2020 – **“Final session of rehearsal, the show is ready”**

The workflow

In the meanwhile...

TUC, with all the partners, is working at the **TIM e-learning platform (O2)**

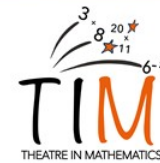
HVL, with Corep and Dors, is working at the **4 scientific articles (O4)**



Multiplier Events

- **Chania** M13, Oct 2019 (TUC)
- **Covilha** M20, Apr 2020 (ASTA)
- **Bergen** M27, Nov 2020 (HVL)
- **Torino** M35, Jul 2021 (COREP)

TIM REFERENCE & CONTACTS



TIM website

www.theatreinmath.eu

To join the Virtual Community:

facebook.com/theatreinmath

**THANK YOU FOR
YOUR ATTENTION!**



5.3 PROJECT CONSORTIUM - HVL

Presentation made by Tor-Helge Allern with general information about HVL.



Western Norway
University of
Applied Sciences

Main campus: Bergen

For faculties – 16 000 students

Tor-Helge Allern
Campus Kronstad
23. October 2019



A merged institution

- ▶ From January 2017, Bergen University College merged with two university colleges to form Western Norway University of Applied Sciences.
- ▶ 16,000 students - one of the largest higher education institutions in Norway.
- ▶ The new institution offers a broad range of academic programmes at Bachelor's, Master's and PhD levels.
- ▶ Four faculties
 - ▶ Faculty of Business Administration and Social Sciences
 - ▶ Faculty of Education, Arts and Sports
 - ▶ Faculty of Engineering and Science
 - ▶ Faculty of Health and Social Sciences





Faculty of Education, Arts and Sports

- ▶ 6200 students, 55 Ph.D.-students – from BA and MA to Ph.D.
 - ▶ Five campuses: Four in regions outside Bergen.
 - ▶ Teacher- and Pre-school teacher training are the major fields.
- ▶ Four institutes
 - ▶ Dep. of Sport, Food, and Natural Sciences
 - ▶ Dep. of Arts Education
 - ▶ Dep. of Pedagogy, Religion and Social Studies
 - ▶ Dep. of Language, Literature, Mathematics and Interpreting



Research

in Faculty of Education, Arts and Sports

- ▶ **Five research centres**
 - ▶ CASE – Creativity, Arts and Science in Education
 - ▶ The Norwegian National Centre for Food, Health and Physical Activity
 - ▶ Centre for Arts, Culture and Communication
 - ▶ Centre for Educational Research
 - ▶ KindKnow – Kindergarten Knowledge Centre for Systemic Research on Diversity and Sustainable Development
- ▶ **Five research programs**
 - ▶ Arts, Creativities and Cultural Practices
 - ▶ Languages, Communication and Learning
 - ▶ Professional and Applied Research in Education
 - ▶ Sustainability, Participation and Diversity
 - ▶ Sports, Physical Activity and Food



Research relevant to TIM at one of five research centres

CASE – Creativity, Arts and Science in Education

▶ ART@CREATIONS

- ▶ Producing knowledge through artistic inquiry within a science education framework. An international network of artists within the European Commission's Horizon2020 project, Coordinated by HVL.

▶ DigiSus

- ▶ *Sustainable* digital practices (SDPs) in kindergartens supporting playing and learning in literacy and arts practices.

▶ The Global Science Opera

- ▶ To envision, create, produce and perform operas as a global community – A meeting point of science and art, of pupils and scientists, of all human cultures, of research and practice.

Relevant research in research PROGRAMS

Sustainability, Participation and Diversity

▶ Critical mathematics education in multilingual classrooms.

- ▶ A large Norwegian Research Council funded project.
- ▶ Teaching argumentation for critical mathematics education in multilingual classrooms" - running from 2018-2021.

▶ Lived Democracy in school

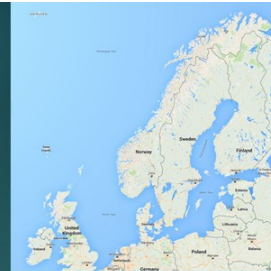
- ▶ The project studies how democracy is lived and learned in education. In particular: how classroom discussions on societal issues can promote democratic Bildung, and the cultural conditions for such development.
- ▶ Societal and social topics in the students' local community are used to catalyze classroom discussions and learning situations.



Applying drama in mathematics – Out of Syria – A process drama in mathematics ...



Associated partners to HVL in Norway



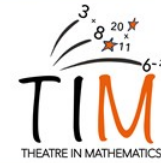
- ▶ **University of Tromsø – The Norwegian Arctic University**
 - ▶ Associated Professor of mathematics, Ove Gunnar Drageset, who initiated the Norwegian project.
 - ▶ Collaboration on the Norwegian project with THA since 2014
 - ▶ Process drama in mathematics with change of roles and perspectives
- ▶ **Nord university**
 - ▶ Professor of Mathematics Mohamed el-Ghami
 - ▶ Professor of drama and theatre, Director Anne Meek

5.4 PROJECT CONSORTIUM - TUC

Presentation made by Nikos Pappas. Slides integrated with the presentation of Output O2.



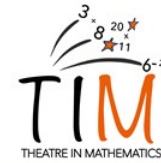
TUC/MUSIC Lab : Info



- Belongs to the Electrical and Computer Engineering School of the Technical University of Crete
 - ~ 30 faculty staff members
 - ~ 20 lab teaching staff members
 - ~ 200 undergraduates per year
 - offers Diplomas, MEngs, PhDs
- Is the first lab of ECE School since 1990
 - faculty members (3)
 - permanent staff (6)
 - many undergraduate/postgraduate students



TUC/MUSIC Lab : Info



- Has participated in more than 60 European R&D projects, and several national projects
- Cooperated with the major organizations in European industry & academia
- TUC/MUSIC has also participated in several European Networks of Excellence

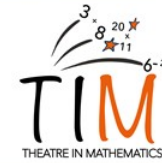
The Coursevo platform



- A multilingual, multifunctional, multimedia oriented platform that supports communities by providing them with activity spaces to
 - co-work in projects (knowledge creation)
 - organize, describe, share and re-use digital resources (knowledge management)
 - support learning processes (knowledge transfer)



Coursevo Platform Evolution



- **2005 - 2010: Courses**
 - Launched and used to support ECE School in TUC employing a Blended Learning Approach
- **2010 - 2016: MOLE**
 - Extended with various multimedia services(video conferences, video presentations synchronized with slides), mechanisms to support multi-linguality
 - MOLE adopted a multi-tenant architecture to enable the support of multiple independent learning spaces
 - Used in various EU and national projects

Coursevo Platform Evolution



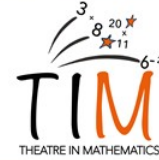
- **2016-today: Coursevo**
 - Improved learning experience design/execution (new services introduced: course structure/units, learning paths, online classrooms and working spaces)
 - Enabled authentication via popular social networks
 - Introduced the Activity Space concept by allowing:
 - Projects (Collaboration),
 - Repositories (Content Sharing),
 - Courses (Learning)



5.5 PROJECT CONSORTIUM - DOORS

Presentation made by Vincenzo Rubino and Simonetta Lingua. Slides integrated with the presentation of Assessment methodology.

DORS –HEALTH PROMOTING CENTER



Who we are

We are a **documentation center** established by the Region of Piedmont in 1998.

Working at the center is a group of professionals in documentation, communication, planning, training, and evaluation who provide the Center's services:

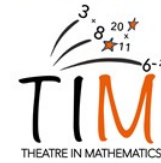
To **disseminate** the culture and practice of health prevention and promotion and to facilitate actions for their development in various sectors with an equity focus

To **facilitate** the process of knowledge transfer and exchange

To **make accessible** robust and updated documentation for planning, managing, and evaluating health promotion and prevention projects and interventions via the inter-sectoral Health in All Policies approach



TIM OUTPUT



Dors will

contribute to the general and quality management of the project

Lead the assessment and the evaluation of:

- TIM methodology design,
- Teachers training design,
- Development of TIM activities,
- Exercises and toolkit for teachers

Write a scientific article about the results of assessment and impact evaluation of TIM methodology on the self efficacy and competences of the teachers trainer and teacher

Contribute to dissemination and exploitation of the project

5.6 PROJECT CONSORTIUM - ASTA

Presentation made by Sergio Novo to present ASTA and its role in the project. No slides used during this presentation, the site of ASTA was projected instead.

Co-funded by the
Erasmus+ Programme
of the European Union



A ASTA CRIAÇÕES CONTRADANÇA PROJETOS SERVIÇO EDUCATIVO CONTACTOS



A ASTA CRIAÇÕES CONTRADANÇA PROJETOS SERVIÇO EDUCATIVO CONTACTOS



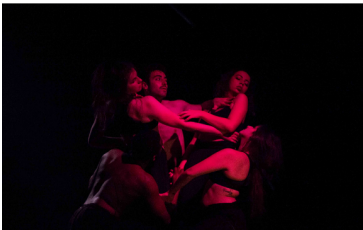
LAVANDARIA EUROPA | 2019



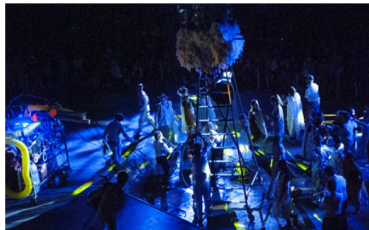
VIAGENS | 2019



LANO KAJ NEĀO | 2019



CÂNTICO NEGRO | 2019



ODISSEIA | 2018



PARADJANOV | 2018



TIM



TELLME



CICLO DE TEATRO UNIVERSITÁRIO DA BEIRA INTERIOR

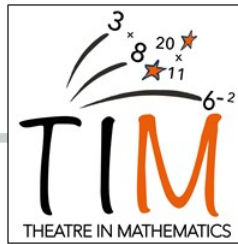
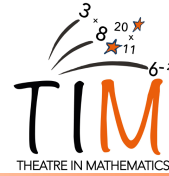


ENSINARTE - MOSTRA DE TEATRO ESCOLAR DA BEIRA INTERIOR

5.7 PROJECT OUTPUTS – O1 – TIM METHODOLOGY MANUAL

Presentation made by Maurizio Bertolini (COREP) on the Intellectual Output O1 – TIM Methodology Manual.

Co-funded by the
Erasmus+ Programme
of the European Union



TIM – Theatre in Mathematics
Project Number: 2018-1-IT02-KA201-048139

O1 – TIM METHODOLOGY MANUAL

MAURIZIO BERTOLINI

Corep – SCT Centre

Multiplier event E1

Chania - Greece

Co-funded by the
Erasmus+ Programme
of the European Union





Output 1: Methodology Manual

Objective

Create a manual containing all the new methodological outputs produced in the project

Target

Professors, trainers and teachers that are using the TIM methodology

The TIM methodology

**“Mathemart -
Playing with
mathematics in the
theatre workshop”**

**“Process Drama -
Change of roles,
perspectives and
role aspects in teaching
mathematics”**

- Adaptable to different contexts
- Efficient, alternative teaching tool
 - Life skills development
- For students from 8 to 14 years old



The Manual will have 4 sections

1. Description of TIM Methodology
2. The TIM training of teachers, to be used by educators (or specialized trainers) to train other teachers
3. Description of Activities and Exercises categorized by curriculum topic
4. Assessment and evaluation toolkit for teachers to evaluate efficacy/efficiency of TIM in their classes

Working process

O1/A1

Methodology design, test and refinement

O1/A2

Teachers training design, test and refinement

O1/A3

Development of TIM activities, exercises and evaluation toolkit



O1/A1 Methodology design, test and refinement

- Creation of a common ground of knowledge:
 - a.** Corep shows Mathemart methodology to Operational Board (**C1**- M4 Dec 2018 Turin - duration 6 days)
 - b.** HVL shows Process Drama methodology to Operational Board (**C2** - M7 Mar 2019 Bergen – duration 6 days)
- TIM methodology first draft (M12 Aug 2019)
- TIM methodology first draft tested with 2 groups of children (**C3** – M13 Sept 2019 Chania - duration 6 days)
- TIM methodology second draft (M18 Feb 2020)

O1/A2 Teachers training design, test and refinement

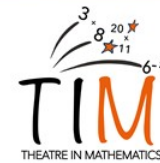
- Beginning of Teachers training design (M14 Oct 2019)
- Release of Teachers training first version (M19 Nov 2019)
- Training of 20 **specialized trainers** (5 from each country)
C4 - M20 Apr 2020 – Greece duration 9 days)
- **Specialized trainers** train **20 groups of 20 students** (5 groups for each country) with OB supervision (M20 Apr 2020 - M27 Nov 2020)
- Release of Teachers training second version (M28 Dec 2020)
- **Specialized trainers** train **20 teachers** each (M28 Dec 2020- M33 May 2021)
- Finalization and release of Teachers training (M34 Jun 2021)



O1/A3 Development of TIM activities, exercises and evaluation toolkit

- Observation, adaptation and revision of TIM exercises and activities used in the project (ends in M34 Jun 2021)
- It will be an ongoing production process parallel to **C1, C2, C3, C4**.
- Sources: DORS assessment and evaluation tools, university professors, researchers, teachers from partners organizations.

TIM REFERENCE & CONTACTS



TIM website

www.theatreinmath.eu

To join the Virtual Community:

facebook.com/theatreinmath

**THANK YOU FOR
YOUR ATTENTION!**



5.8 PROJECT OUTPUTS – O2 – E-LEARNING PLATFORM

Presentation made by Nikos Pappas to present the current status regarding the e-learning platform. A demonstration of the current installation of the platform was also made presenting the initial set up of the platform to enable the initiation of the TIM Community of Practice.

TIM – Theatre in Mathematics
Project Number: 2018-1-IT02-KA201-048139

e- LEARNING PLATFORM
Nikos Pappas

Technical University of Crete
TUC/MUSIC Lab

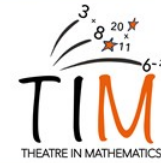
Multiplier event E1

Chania - Greece

Co-funded by the
Erasmus+ Programme
of the European Union



The e-learning platform of TIM

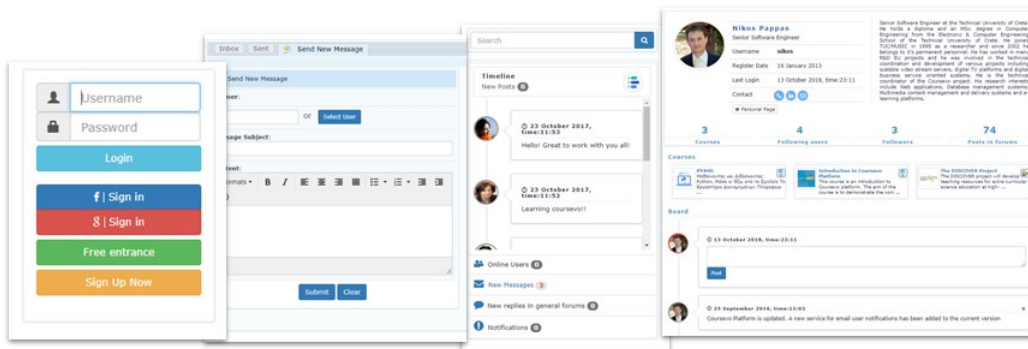


- The TUC/MUSIC as the technical partner in TIM project will provide, setup and support the TIM e-learning environment
- The target group of the TIM project are teachers.
- 20 experts (5 per country) will be trained to train teachers and at least 400 teachers will be trained in TIM Methodology
- The TIM e-learning platform will be the virtual place where all these professionals can meet, exchange opinions and share knowledge about TIM.

Coursevo Platform / Users



- Social Network Authentication/Registration
- User Directory - User Profiles - Presence
- Personal messages - Instant Messages - Personal Board - Timeline

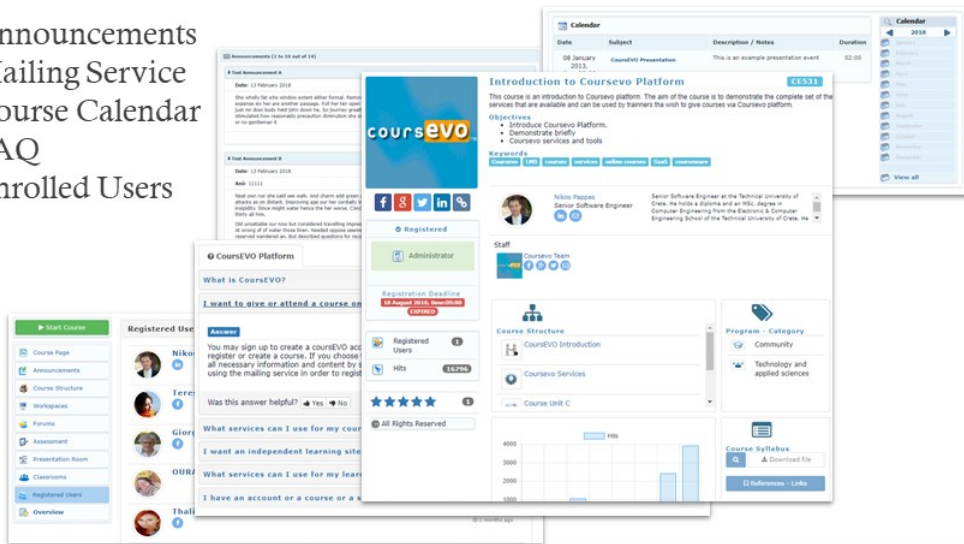




Coursevo Platform / Course Services



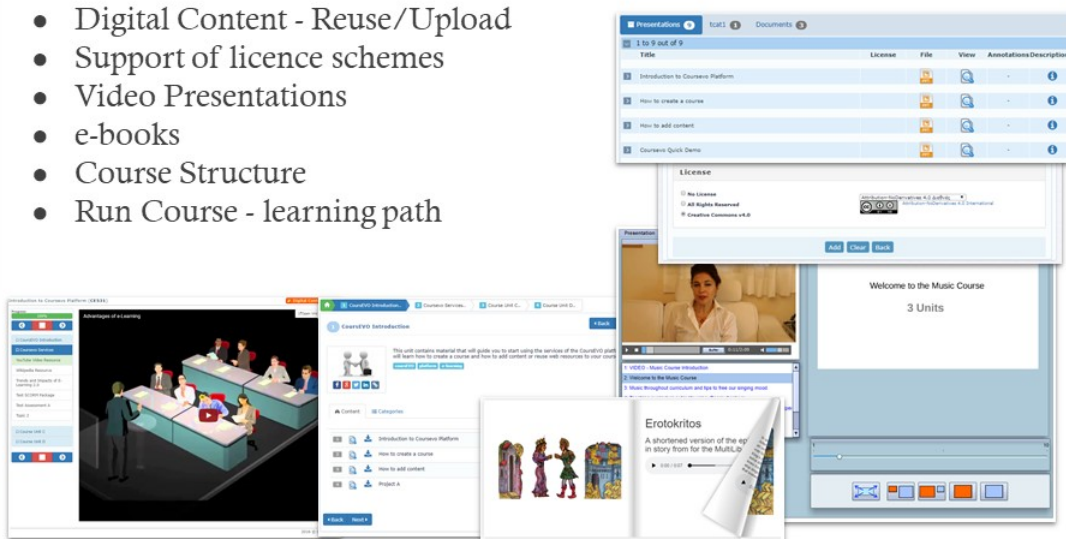
- Announcements
- Mailing Service
- Course Calendar
- FAQ
- Enrolled Users



Coursevo Platform / Course Services

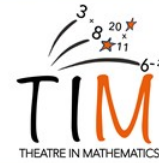


- Digital Content - Reuse/Upload
- Support of licence schemes
- Video Presentations
- e-books
- Course Structure
- Run Course - learning path





Coursevo Platform / Course Services



- Workspaces
- Work groups
- Forums
- Chat
- Online/recorded Classrooms

Lab Exercises
Description 2 vs vsd fvs dfv wbs fhw fb wfb wfb wfb h bw redf asd etr ald he of vs fe rrr

Working Groups
-The working groups consist of 5 persons
-The registration of participation is not active
[My Working Group](#)
[View working groups](#)

Reference Material
Notes - Useful Digital Material
[View](#)

Group Discussions
Discussion and cooperation among members of working groups
Group Forums
[Enter](#)

Group Meetings
Live meetings into virtual room among members of working groups
[Enter](#)

Forum: Questions about the use of the Coursevo Platform

Apply Send me notifications about new posts in this topic.

Forum Post:
Welcome to Coursevo Introduction Course. I will give my best to answer any questions about the platform.
Hello! How can I paste a reply in the message box in the forum? I have written something on word and I right click in the message box but there is no option to paste it.
thank you

Project A

INTRODUCTION

- CourseEVO is an online e-learning solution.
- CourseEVO is offering the space and the technology for those that wish to find an effective e-learning solution, without having to cope with system setup and maintaining issues.
- The platform is targeting a wide range of audience, from individuals that wish to teach or train to organizations that seek for advanced learning, course and user management capabilities.
- CourseEVO can be used to both distance e-learning and blended learning schemes.

Coursevo Platform / Course Services



- Personal Storage
- Polls
- Course rating
- Reservations
- Assessments
- Certificates

Upload files

Registered Users

My material

Course Rating

Test Assessment A
Pappas Nikos
Start: 15 October 2018, 15 October 2018, Time: 10:07
End: 15 October 2018, 15 October 2018, Time: 10:12
Question: 1 out of 1, Weight: 10, Time: 5 m

1. Question
What is CourseEVO?

1. Reply
Select more than one answer choices

A Social Platform

Your space to share knowledge

An online e-Learning solution

[Post Reply](#)

Resource
Description: Test description. Case read they re favourable on. Nay preference dis

Hour	Monday
09:00	
10:00	K.1
11:00	
17:00	
18:00	

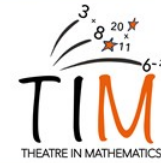
Reservation: K1
Monday [09:00:00 - 12:00:00]
User Code: 1 1000454
Pappas Nikos

Bar Chart: What is your opinion about the Coursevo

Opinion	Count
Not useful	~1000
Very useful	~4500
Useful for blended learning	~3500



Activity Space in Coursevo E1 – First Multiplier Event



English (en) | Home | Programs | Statistics | Contact | Coursevo | Login

E1 - First National Event - Δράση Διάχυσης Αποτελεσμάτων, Χανιά 23/10/2019

E1 - First National Event - Δράση Διάχυσης Αποτελεσμάτων, Χανιά 23/10/2019

Μεταβα επιμέρους με στόχο την ενημέρωση των εκπαιδευτικών και κάθε ενδιαφερόμενου για τους στόχους και τα αποτελέσματα του έργου TIM με έμφαση στην παρουσίαση τη μεθοδολογίας TIM - Theatre in Mathematics - Το θέατρο στα Μαθηματικά. Η παρουσίαση γίνεται με βιωματικό τρόπο, μέσω θεατρικών εργασιών. Παρουσιάζεται επίσης η ηλεκτρονική πλατφόρμα του έργου καθώς και τα πρώτα αποτελέσματα συνεργασιών με τοπικά σχολεία και ομάδες εκπαιδευτικών.

σbjectives

- Παρουσίαση των στόχων και των αναμενόμενων αποτελεσμάτων του έργου.
- Διεξαγωγή βιωματικών εργασιών για τη γνωριμία με τη μεθοδολογία TIM - Το θέατρο στα Μαθηματικά
- Παρουσίαση της ηλεκτρονικής πλατφόρμας TIM
- Διερεύνηση της αρχικής κωνότητας εκπαιδευτικών στην Ελλάδα που ενδιαφέρονται να παρακολουθήσουν την πορεία του έργου και να συμμετάσχουν στις δράσεις του

Keywords
Theatre in Mathematics

Registered

- Administrator

Registration Deadline: **Open**

Registered Users: **71**

Hits: **925**

Contributors

- Nikos Pannic, Senior Software Engineer

TIM REFERENCE & CONTACTS



TIM website

www.theatreinmath.eu

To join the Virtual Community:

facebook.com/theatreinmath

**THANK YOU FOR
YOUR ATTENTION!**



5.9 PROJECT OUTPUTS – O3 – THEATRICAL CONFERENCE

Presentation made by Elena Cangemi (COREP) about Intellectual Output O3 – Theatrical Conference “The Fear of Mathematics”



TIM – Theatre in Mathematics
Project Number: 2018-1-IT02-KA201-048139

THEATRICAL CONFERENCE
“THE FEAR OF MATHEMATICS”

Elena Cangemi – COREP|SCT Centre

Output presentation

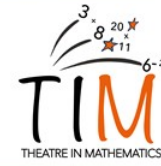
Oct. 23rd, 2019 Chania, Greece

Co-funded by the
Erasmus+ Programme
of the European Union





WHAT IS A THEATRICAL CONFERENCE?



Storytelling

Performance

Games

**Audience active
participation**



WHAT IS A THEATRICAL CONFERENCE?



Objective

Critical thinking + emotions
to overcome and reflect on fear of mathematics



Actors and target

1 actor for each partner's country
Students and teachers



Tools

Social Community Theatre Methodology in class
to collect material for the performance



COLLECTING MATERIALS AND DRAWING A FIRST THEATRICAL SCRIPT



Materials search and collection

existing literature, experts and partners,
students and teachers.

Creation of a first draft of the theatre script

First session of rehearsal

Actors Training (March 2020 Turin, Italy)

WRITING THE THEATRICAL SCRIPT AND PREPARING THE ONSTAGE THEATRICAL CONFERENCE



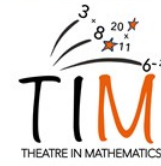
Creation of the final theatre script (July 2020)

Script translation in 4 languages

Second session of rehearsal and preparation of onstage performance (Fall 2020 Chania)



SHOWS IN EACH COUNTRY



Show of the theatrical conference to 1st audience

Feedback collection

Final presentation in each country

October 2020 – Portugal

November 2020 – Norway

February 2021 – Greece

July 2021 - Italy

TIM REFERENCE & CONTACTS



TIM website: www.theatreinmath.eu

To join the Virtual Community:

facebook.com/theatreinmath

tim.coursevo.com

**THANK YOU FOR
YOUR ATTENTION!**



5.10 PROJECT OUTPUTS – O4 – SCIENTIFIC PUBLICATIONS

Presentation made by Tor-Helge Allern to present Intellectual Output O4 – Scientific Publications.

TIM – Theatre in Mathematics
Project Number: 2018-1-IT02-KA201-048139

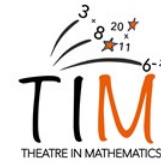
OUTPUT 04 – SCIENTIFIC ARTICLES

Tor-Helge Allern
Norwegian University of Applied Sciences
E1 – Chania
Chania, Crete

Co-funded by the
Erasmus+ Programme
of the European Union



INTELLECTUAL OUTPUT



- The results of central issues in the project will be presented and analysed in four scientific articles:
 - written in a collaboration between the partners.
- The empirical foundation and documentation for the discussion in the four articles are:
 - observation (researchers) and participatory observation (teachers and instructors), interviews and conversations with teachers and students, log, photos-video, and questionnaire.

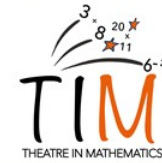
Tasks: Four articles



1. “On the use of roles and role categories in drama and learning processes in mathematics”.
2. “Ethical problems, dilemmas and controversial issues in education”.
3. “Depth learning in mathematics through drama - challenges and possibilities”.
4. The results of assessment and impact evaluation of TIM-methodology on the self-efficacy and competences of the teacher-trainers and teachers. (DORS).



Action line - A1 (Month 7-Month 20)



- Preparations – a common phase with planning and basic questions in the writing process for all four articles:
- Introduction to writing scientific articles.
 - A seminar on the writing process, its phases, demands (including a common system of references), and relation to the research questions.
- Theoretical background studies, exchange of viewpoints on theory related to the research questions. Skype-meeting after the seminar.
- Theoretical summary relevant for the article.

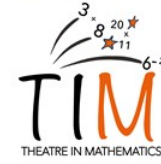
Action line – A2 (M15-M28)



- **Investigations**
 - A phase oriented towards working on the specific research questions:
- **Transcription of material**
 - with an analysing process.
- **First draft of article.**
 - Exchange among authors through a Skype-meeting, and rewriting the article.

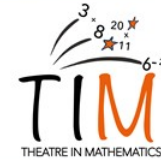


Action line - A3 (M17-30)



- **Closing work**
- **Complete the article**, using a Skype-meeting to finish the writing process.
- **Publishing**, including contact with editors on the referee-process.

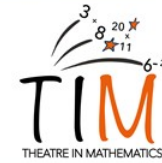
Stages in the writing process



- **Investigations**
- **Transcriptions and analysing** the material ending in
- **A first draft**
- **Discussions** in Skype-meeting
- **Closing work** and work on ...
- **Publishing.**



TIM REFERENCE & CONTACTS



TIM website

www.theatreinmath.eu

To join the Virtual Community:

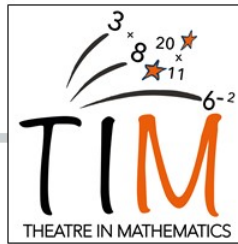
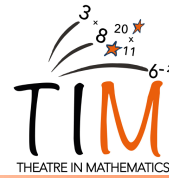
facebook.com/theatreinmath

**THANK YOU FOR
YOUR ATTENTION!**

5.11 PROJECT OUTPUTS – ASSESSMENT FRAMEWORK

Presentation made by Vincenzo Rubino and Simonetta Lingua to present DOORS role in the project as responsible for the evaluation of project results and the corresponding assessment framework.

Co-funded by the
Erasmus+ Programme
of the European Union



TIM – Theatre in Mathematics
Project Number: 2018-1-IT02-KA201-048139

ASSESSMENT AND EVALUATION

VINCENZO RUBINO SIMONETTA LINGUA

Dors - Italy

Multiplayer Event

CHANIA - CRETE

Co-funded by the
Erasmus+ Programme
of the European Union





LOGICAL EVALUATION FRAMEWORK



TIM + Teacher of Math

1° Hp: Development

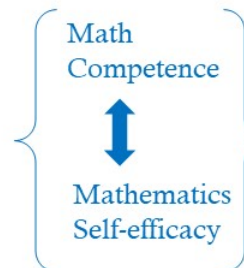
2 Hp: Decreasing

3 Hp: Improvement



HEALTH LITERACY

- Anxiety
- Fear
- Prejudice
- Boring
- negative self-judgment
- Boredom
- Shame



MATH LITERACY

TIM VALIDATION PROCESS



Administration of:

- Mathematics Self-Efficacy and Anxiety Questionnaire to the pupils, preferably a week before the C3 begins
- A simple likert scale to evaluate liking about a usual math lesson with a math teacher.

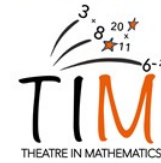
Deepen assessment with observation greeds about life skills and math competence and a smart questionnaire with open ask about soft skills needful to use TIM by a math teacher.

Administration of:

- Mathematics Self-Efficacy and Anxiety Questionnaire to the pupils focused on TIM, after last session of TIM;
- A simple likert scale to evaluate liking about specific attitude of trainer, tools employed, exercise and game used, etc.



TIM REFERENCE & CONTACTS



TIM website

www.theatreinmath.eu

Dors website

www.dors.it

To join the Virtual Community:
facebook.com/theatreinmath

**THANK YOU FOR
YOUR ATTENTION!**

5.12 MATHEMATICS EDUCATION IN THE 21ST CENTURY

Presentation made by Mona Røsseland (HVL) presenting important insights and current trends regarding Mathematics education in the 21st century and linking modern approaches to mathematics education with drama and TIM vision.



Mathematics education in the 21st century

Mona Røsselund,



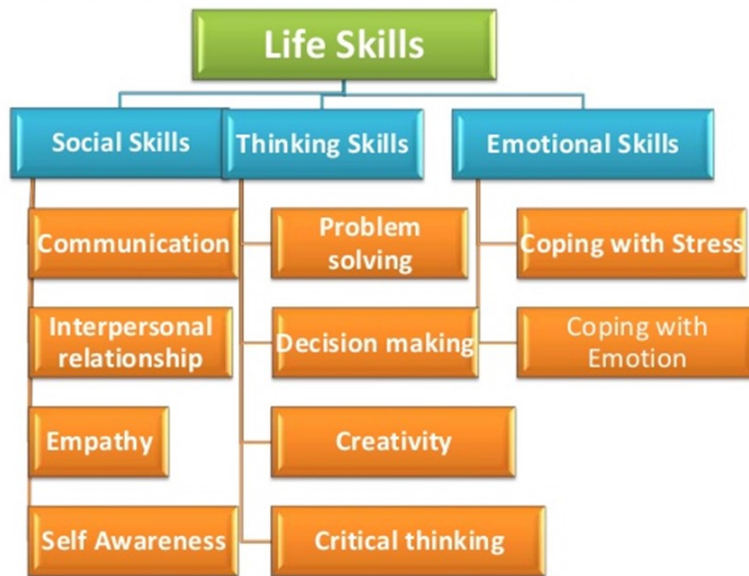
International trends

Deeper learning





The Ten core Life Skills as laid down by WHO are:



New curriculum in Finland

- The new Finnish curriculum **emphasizes the joy of learning** and the active role of students.
- Learning should provide **positive emotional** experiences. Emphasis on interaction and creative activities to improve learning.
- There **will be changes** to the traditional format where students sit passively in front of the teacher, listen to lessons or wait to be asked.

➤ Imeli Hollinen,
Head of Curriculum Development at the FNBE





WHAT IS THE KEY BUSINESS OF DOING MATHEMATICS TODAY AND IN THE FUTURE?

To memorize? To think?

“As the 21st century approaches ...
countries will need citizens prepared
to participate in ‘brain-power’
industries”

Beaton, Mullis, Martin, Gonzalez, Kelly & Smith 1996

The background for the new curriculum in Norway

- What the students learn should be **relevant**.
- **The world is changing**; new technology, new knowledge and new challenges. We need children and young people who reflect, are critical, inquiring and creative.
- There will be **a better connection** between the subjects.
- More **deeper learning** and more practical approach



What is deeper learning?

Deeper learning means that students use their **ability to analyze, solve problems** and **reflect** on their own learning to construct a lasting understanding.

The central point of competence is **application**, that is, the capacity to apply knowledge and skills to cope with challenges and solve tasks.

Instrumental understanding
- Surface structure

Relational understanding
- Deep structures



Richard Skemp





Core elements in the teaching and learning of mathematics

in Norway

Representation and Communication

Inquiry and Problem Solving

Modeling and Applications

Abstraction and Generalization

Reasoning and argumentation

Representation and Communication

Students should:

- develop a mathematical language through conversations, reasoning and reflection
- alternate between appropriate representational forms such as symbols, figures, drawings, graphs, tables, diagrams, verbal expressions, concrete
- understand the relationships between different forms of representation



Different representation for a number

Developing good numerical understanding depends on different representations


(various representations in mathematics, such as symbols, drawings, stories, hands-on, charts and tables) and understanding of their relationship.



Freudenthal Institute,
Webb, D. C., Boswinkel, N., & Dekker, T. (2008).

Algebra with multiple unknowns

- $4x = 80$
- $3x + 3y = 75$
- $2z + q = 80$
- $3q + 2x + y = 75$

★ =	■ =	▲ =	● =	
▲ ▲ ▲ ▲		= 80		
▲ ▲ ▲ ● ● ●		= 75		
■ ■ ★		= 80		
★ ★ ★ ▲ ▲ ●		= 75		

- Finn verdiene til x , y , z og q



How much have they saved?

Ana, Thea and Philip save money for their vacation.

Ana has saved three times as much as Philip.

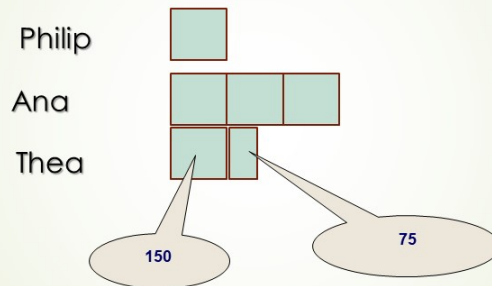
Thea has saved half as much as Ana.

Thea has saved 75 Euro more than Philip.

How much has each of them saved?



Bar model strategy





Modeling and Applications

Students should

- translate into a mathematical language
- use mathematical models and interpret solutions
- consider the scope and limitations of a model
- use programming to explore mathematical models



Abstraction and Generalization

Students should

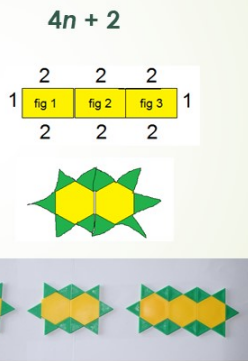
- explore the pattern
- generalize contexts
- develop algebraic thinking





To change between representations

- Abstract
- Abstract model
- Model of real things
- Real things



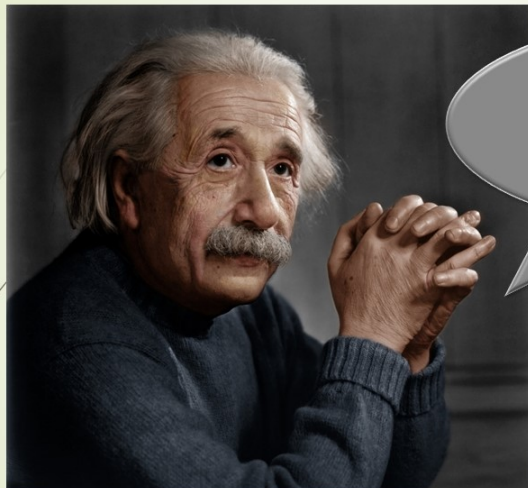
Pre-algebra



Inquiry and Problem Solving

Students should:

- look for patterns and find relationships.
- place more emphasis on the strategies and the process than on the solutions



«It's not that I'm so smart; it's just that I stay with problems longer»



Reasoning and argumentation

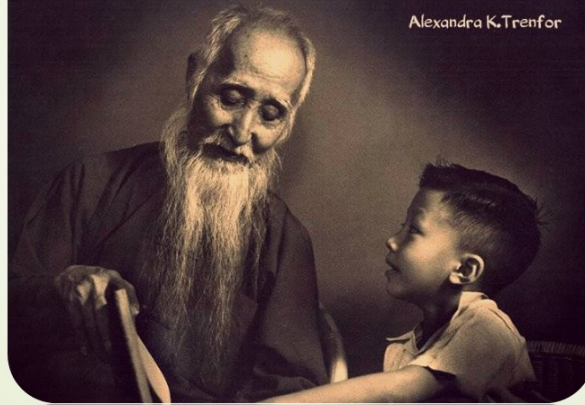
Students should:

- ▀ argue for their own solutions and procedures
- ▀ understand a mathematical reasoning
- ▀ evaluate the validity of procedures and results
- ▀ Take advantage of other people's ideas and arguments



"The best teachers are those who show you where to look, but don't tell you what to see."

Alexandra K. Trenfor



5.13 THEATRE IN EDUCATION

Presentation made by Nikos Govas, Leader of the Network for Theatre in Education in Greece on various aspects of Theatre in Education, the activities of the network and possible synergies with the TIM project.



"Theatre in Education"
what do you mean?



An..obvious answer:

A group of young people performing a play

A ...not so obvious vocabulary

- **Symbolic Play / Dramatic Play (Συμβολικό-Δραματικό παιχνίδι)**
- **Playing-Through-Theatre (Θεατρικό παιχνίδι)**
- **Role Playing (Παιχνίδια ρόλων)**
- **Theatre Studies (Θεατρολογία)**
- **Theatre-in-Education (Θεατροπαιδαγωγική)**
- **Drama-in-Education (Εκπαιδευτικό δράμα)**
- **Process Drama (Θέατρο Διαδικασίας)**
- **Dramatization (Δραματοποίηση-Δραματική Τέχνη στην Εκπαίδευση)**
- **Theatre for development (Θέατρο για την ανάπτυξη)**
- **Theatre of the Oppressed – Forum Theatre (Θέατρο του Καταπιεσμένου, Θέατρο Φόρουμ)**
- **Social-Community Theatre (Κοινωνικό Θέατρο, Θέατρο της Κοινότητας)**
-



What teachers do or can possibly do with their students?

What teachers do or can possibly do with their students (I)

- Choose or devise a play to perform
- Teach theatre studies class
 - *"Theatre as Art Form (Μορφή Τέχνης)"*



What teachers do or can possibly do with their students
(II)

- Teach core subjects syllabus within curriculum (i.e language, history, social sciences, geography, maths etc).
 - **«Theatre as Teaching/Learning Tool»**
 - **διδακτικό εργαλείο».**

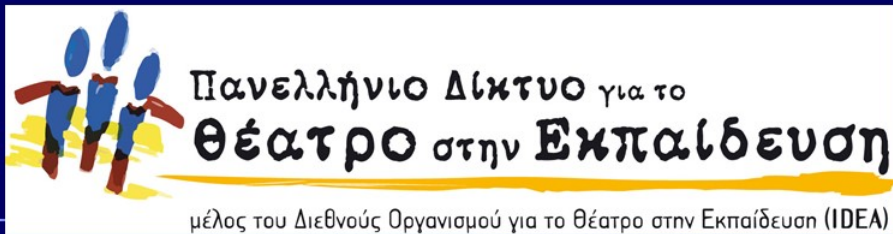
What teachers do or can possibly do with their students
(III)

- Projects on issues where “decision making”, “personal expression & views”, “empowerment”, are very important and develop in a “problem solving environment” .
- .
 - **Theatre**
 - **as a social intervention and research tool**
 - **εργαλείο «έρευνας και κοινωνικής παρέμβασης».**



- theatre in education:
- as an art form,
- as learning tool
- as a tool for research & social intervention.

▪ How? Who? Where?



Greek teachers & artist association for the promotion of research on and practice of theatre, educational drama and other performing arts within formal and non formal education

www.TheatroEdu.gr
info@theatroedu.gr

TENet-Gr



Est. 1998

We do not know if every student can become an artist; we do know that all students can be creative.

The power of creativity is like the power of love, which strives to come out.

It cannot be taught, but we, educators, can shape the environment for it to take place.



Πανελλήνιο Δίκτυο για το Θέατρο στην Εκπαίδευση
μέλος του Διεθνούς Οργανισμού για το Θέατρο στην Εκπαίδευση (IOPEA)

“ Δεν ξέρουμε αν όλοι οι μθητές μπορούν να γίνουν καλλιτέχνες, ξέρουμε, όμως, ότι όλοι μπορούν να είναι δημιουργικοί. Αυτή η δημιουργικότητα είναι κάτι σαν τη δύναμη της αγάπης, που προσπαθεί να βγει προς τα έξω. Δεν διδάσκεται. Αλλά εμείς μπορούμε να διαμορφώσουμε τις συνθήκες, ώστε κάτι τέτοιο να συμβεί. ”

Athens International Conferences





Teacher's Training Seminars



Theatre Summer Camps





Publications

Books, Conference Proceedings, Workshop Materials,



Journal



Co-funded by the Erasmus+ Programme of the European Union



TiE/DiE Projects
θεατροπαιδαγωγικά προγράμματα



κι αν ήσουν εσύ;

2015 Αθήνα | Θεσσαλονίκη | Πάτρα | Ρόδος

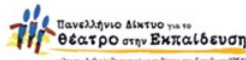
Ένα πρόγραμμα ευαισθητοποίησης στα Ανθρώπινα Δικαιώματα και τους Πρόσφυγες με βιωματικές δραστηριότητες, τεχνικές θεάτρου και εκπαιδευτικού δράματος.



WWW.THEATROEDU.GR



Με τη συνεργασία του Υπουργείου Παιδείας και Θρησκευμάτων και του Οργανισμού για τους Πρόσφυγες



it could be me— it could be you

An awareness raising project, targeting the educational community on human rights and refugees issues using experiential learning, theatre and educational drama techniques.

Teacher seminars
Students Workshops
Student Festivals
"Together" Action

2015-2019
Over 9000 teachers & 18000 students



➤ Theatre in Mathematics ?

www.TheatroEdu.gr



5.14 TEACHING EQUATIONS WITH ROLE PLAYING GAMES

Presentation made by Thodoris Paraschou, teacher of Mathematics in Secondary Education, on a specific example of employing theatrical techniques to teach a subject in Mathematics: How to solve equations. The actual experience in using this approach in the classroom are presented and commented.





Σενάριο μαθήματος: Η δραματοποίηση των εξισώσεων

Σκοπός

Να αναπαραστήσουν, μέσα από τη δραματοποίηση, τις έννοιες των εξισώσεων, των μεταβλητών και των θετικών και αρνητικών αριθμών.

Οι επιμέρους στόχοι

Να επιλέξουν ένα μαθηματικό πρόβλημα που να λύνεται με εξισώσεις και να το κατανοήσουν.

Να αντιληφθούν την αλλαγή των μεταβλητών με συγκεκριμένα παραστατικά μέσα, όπως ρούχα ή αξεσουάρ ένδυσης.

Να εξοικειωθούν με τις νέες έννοιες των μαθηματικών με έναν ευχάριστο και παιγνιώδη τρόπο.

Να παρουσιάσουν στους συμμαθητές και συμμαθήτριάς τους το αποτέλεσμα της δραματοποίησης την οποία, προηγουμένως, προετοίμασαν.

Να συνεργαστούν μεταξύ τους με στόχο να πετύχουν την συντονισμένη παρουσίαση στο κοινό.

Σενάριο μαθήματος: Η δραματοποίηση των εξισώσεων

Ενδεικτική περιγραφή υλοποίησης

Ισον

Θετικό πρόσημο

Αρνητικό πρόσημο

Μεταβλητές

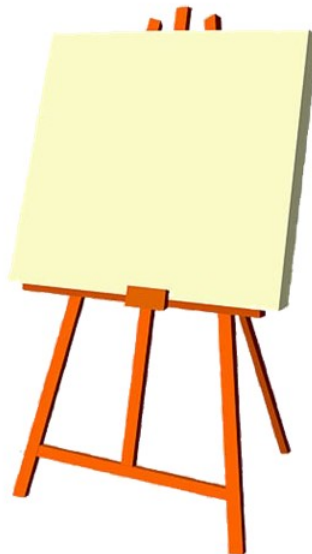
Αριθμοί



Η παρουσίαση του παιχνιδιού ρόλων από μαθήτριες και μαθητές

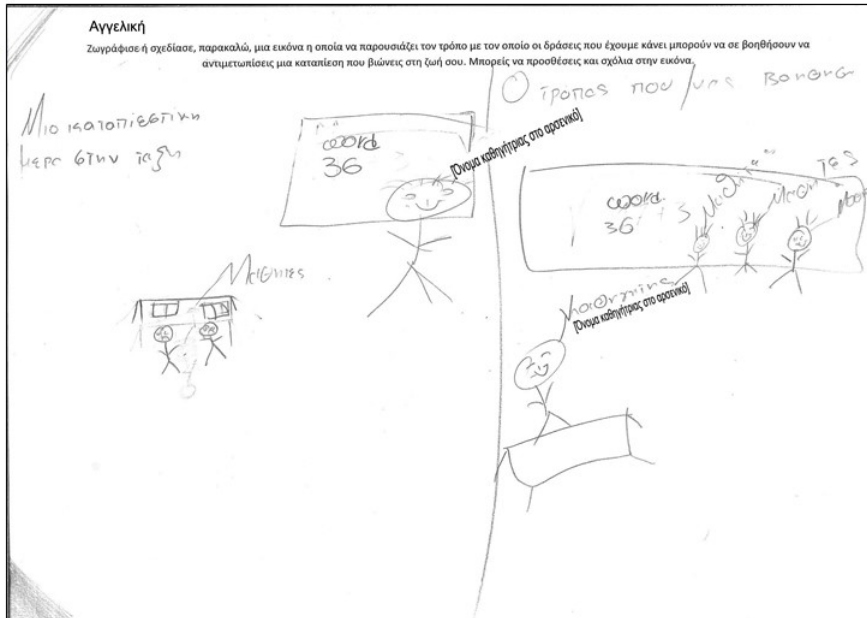


Ερευνητικές ιχνογραφίες μαθητριών και μαθητών
αναφορικά με το παιχνίδι ρόλων που υλοποίησαν

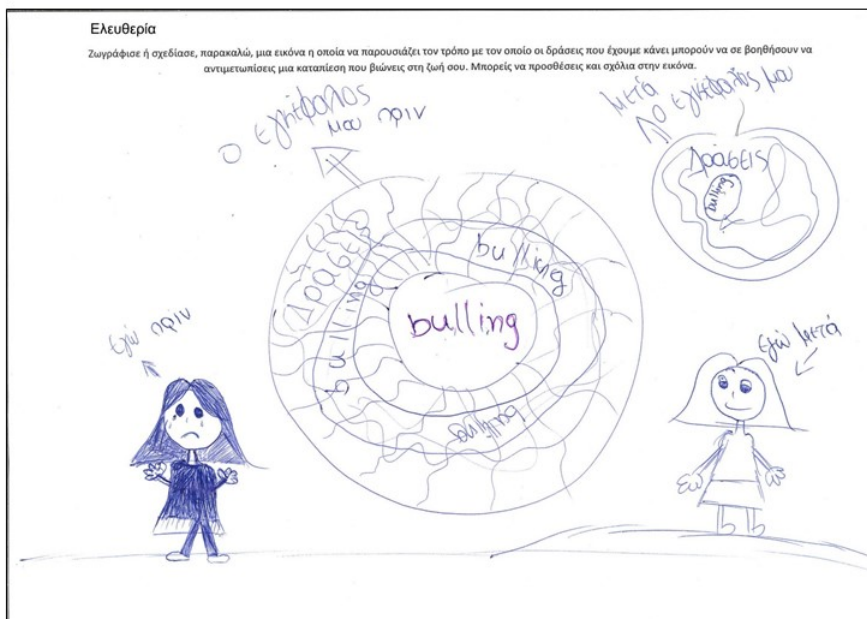




Ερευνητικές ιχνογραφίες μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν



Ερευνητικές ιχνογραφίες μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν





Ερευνητικές ιχνογραφίες μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν

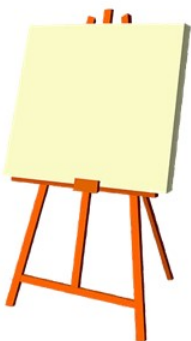


Μαρία
Ζηγράψοε ή σχεδιάσε, παρακαλώ, μια εικόνα η οποία να παρουσιάζει τον τρόπο με τον οποίο οι δράσεις που έχουμε κάνει μπορούν να σε βοηθήσουν να αντιμετωπίσεις μια κατάσταση που βιώνεις στη ζωή σου. Μπορείς να προσθέσεις και σχόλια στην εικόνα.

Από: μαθηματικά

Δραματοποίηση μαθηματικών.

Ερευνητικές ιχνογραφίες μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν



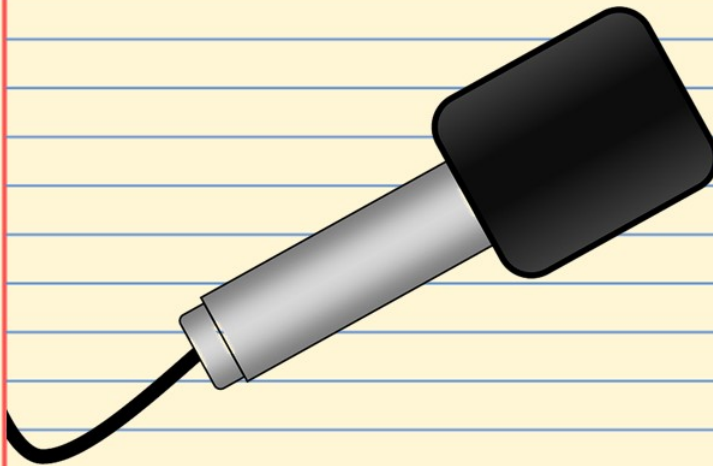
Αντωνία
Ζηγράψοε ή σχεδιάσε, παρακαλώ, μια εικόνα η οποία να παρουσιάζει τον τρόπο με τον οποίο οι δράσεις που έχουμε κάνει μπορούν να σε βοηθήσουν να αντιμετωπίσεις μια κατάσταση που βιώνεις στη ζωή σου. Μπορείς να προσθέσεις και σχόλια στην εικόνα.

ΜΕ ΚΑΤΑΛΕΞΕΙ Η ΜΑΡΙΑ ΗΟΥ.

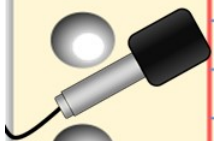
ΤΟ ΑΝΕΙΜΕΤΩΛΙΣΜΕ ΕΓΩ!



Ερευνητικές συνεντεύξεις μαθητριών και μαθητών
αναφορικά με το παιχνίδι ρόλων που υλοποίησαν



Ερευνητικές συνεντεύξεις μαθητριών και μαθητών
αναφορικά με το παιχνίδι ρόλων που υλοποίησαν



Να μαθαίνει μέσα από εναλλακτικούς
τρόπους που θα τον/την βοηθούν να
εκφράζεται και να νιώθει άνετα.



Ερευνητικές συνεντεύξεις μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν

Η Μαίρη θέλοντας να μαθαίνει βιωματικά υποστηρίζει ότι:

“[Τη δραματοποίηση στα μαθηματικά] το πήρα πιο πολύ σαν να πω ότι θα μάθουμε καλύτερα τα μαθηματικά με βάση να βάζουμε τον εαυτό μας μέσα σε αυτά. Και με βάση αυτό το πήρα, δεν το πήρα ως διαγώνισμα ή ως τεστ.”, “Πιστεύω ότι πιο ωραίο ήταν αυτό [η δραματοποίηση] διότι με αυτόν τον τρόπο, δηλαδή, ότι είσαι εσύ ο αριθμός, δηλώνεις σαν να σκέφτεσαι τι πρέπει, ποιος αριθμός πρέπει να γίνεις για να λύσεις και την εξίσωση. Πώς το εννοώ αυτό τώρα; Όταν ανεβαίναμε πολλά άτομα και έπρεπε να λύσουμε την εξίσωση, πιστεύω, βοηθούσε το κάθε άτομο να καταλάβει, και εμένα, γιατί έμπαινα σαν να ήμουν ο αριθμός που έπρεπε να λύσει την εξίσωση. Και ο αριθμός να ήταν ο ίδιος μου ο εαυτός.”

Ενώ σχολιάζοντας τη δραματοποίηση θεωρεί ότι

“Κάποια παιδιά μπορεί να πιστεύουν ότι δεν κάνουν μάθημα, αλλά καταλαβαίνουν την εξίσωση πως να τη λύσουν και στα διαγωνίσματα και αυτά λένε «πως το έλυσα αυτό;» ενώ το είχαν καταλάβει από τη διασκέδαση που πέρασε σε αντίληψη, που λύσανε την εξίσωση έτσι”.

Ερευνητικές συνεντεύξεις μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν

Η Αντωνία θέλοντας να έχει το μάθημα ενδιαφέρον, να κάνει κάτι καινούριο και να μαθαίνει με καινούριο τρόπο επισημαίνει ότι :

“Μου άρεσε πολύ όταν ασχοληθήκαμε με το θεατρικό, παρόλο που ήταν κάτι δύσκολο, ήταν ενδιαφέρον. Γιατί συνήθως οι καθηγητές έρχονται, κάνουν τη δουλειά τους, ένα μάθημα, τέλος πάντων, και συνήθως, τα παιδιά βαριούνται και τέτοια. Ενώ με αυτό προσπαθήσατε να μας βοηθήσετε να δούμε τα μαθηματικά με άλλο μάτι.”, “θεωρώ ότι, προσωπικά εμένα, μου άρεσε γιατί, όπως σας είπα, ήταν ένας διαφορετικός τρόπος, είδα διαφορετικά το μάθημα και ήταν ενδιαφέρον”, “Οπότε πιστεύω ότι στη σκηνή θα μαθαίνεις περισσότερο και με τον τρόπο που θα μιλούσε ο αφηγητής. Από κει πιστεύω ότι, για μένα τουλάχιστον, θα μάθαινες περισσότερο”.



Ερευνητικές συνεντεύξεις μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν

Η Λία αναφερόμενη στη μάθηση μέσα από το παιχνίδι και τη διασκέδαση επισημαίνει ότι:

“[Το όταν παίζουμε και μαθαίνουμε] Είναι πιο εύκολο. Είναι πιο εύκολα. Για τα μικρά παιδιά υπάρχουνε, για να μάθουν, υπάρχουν βιβλιαράκια που τραγουδάνε, που... Διάφορα πράγματα. Οπότε, γιατί και για μας τους μεγάλους να μην υπάρχει κάτι τέτοιο. Ναι, γιατί όχι. Για να μάθουν κάτι παραπάνω. Αν τα μαθηματικά ήταν ένα τραγούδι θα το είχα μάθει απέξω και τα κείμενα και όλα. Έχω περίπου 28 τραγούδια στη συλλογή μου, στο κινητό μου και τα ξέρω όλα από έξω. Και αυτά που δεν τα ξέρω προσπαθώ να τα μάθω.”, “[Αν τα μαθηματικά ήταν ένα από αυτά τα τραγούδια] Θα ήταν η ζωή μου πιο εύκολη”.

Ερευνητικές συνεντεύξεις μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν

Ο Θοδωρής κάνει μια αναφορά για τα σύμβολα και τα σημεία που χρησιμοποιούμε για να αναφέρουμε αφαιρετικές έννοιες. Υποστηρίζει ότι :

“[Τα κουστούμια] Μου το έδειξαν πιο εμφανή. Άμα, απλά, κουνιόταν ο ένας με τον άλλο, χωρίς να φαίνεται η διαφορά, θα καταλάβαιναν [οι θεατές] ότι ήμασταν όλοι το ίδιο, δεν θα μπορούσαμε να μάθουμε κάτι. Αυτά ήταν για να ξεχωρίσουμε. Βοήθησε”.



Ερευνητικές συνεντεύξεις μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν

Η Ελευθερία συμπληρώνει για την ίδια θεματική ότι:

“... μου έκαναν εντύπωση ότι για το αρνητικό είχαμε το μαύρο και για το θετικό είχαμε το άσπρο. Ότι βάζουμε το φουλάρι, ας πούμε, για το χ. Ο σκηνοθέτης έβαζε το καπέλο και το σακάκι,...”, “Και ότι μας είχατε πει ότι αυτό είναι το φουλάρι, η μεταβλητή, ότι ήταν συγκεκριμένο, το ξέραμε τι ήτανε και αυτό μας διευκόλυνε και περισσότερο στη δραματοποίηση και καταλαβαίναμε ότι αυτό είναι αυτό, το άλλο είναι εκείνο και το άλλο είναι εκείνο και μας βοήθησε.”, “Γιατί άμα δεν έχεις τα κουστούμια θα πεις «Ποιος είναι αυτός;» και θα ρωτάει ο κόσμος «Ποιος είναι αυτός; Ποιος είναι αυτός;». Γιατί και στα κανονικά έργα, σαν ηθοποιοί, δηλαδή, κανονικοί ηθοποιοί φοράνε κάποια ρούχα και υποδύονται κάποιον ρόλο. Εμείς άμα δεν είχαμε τα κουστούμια, όπως και οι ηθοποιοί άμα δεν είχαν τα κουστούμια, δεν θα μπορούσαν να κάνουν παράσταση”.

Ερευνητικές συνεντεύξεις μαθητριών και μαθητών αναφορικά με το παιχνίδι ρόλων που υλοποίησαν

Η Λία αφού έζησε την εμπειρία της δραματοποίησης στα μαθηματικά θεωρεί ότι:

“Παραπάνω, νομίζω, μου αρέσουν τα μαθηματικά. Αν και πιο παλιά αν με ρωτούσατε δεν μου άρεσαν καθόλου γιατί τώρα σκέφτομαι περισσότερο και είναι πιο ωραίο.”, “Εννοώ ότι αρχίζω σιγά-σιγά το μυαλό μου να καταλαβαίνει περισσότερα πράγματα και στα μαθηματικά, αλλά και στην καθημερινότητα, γιατί συνδέονται όλα αυτά και είναι πολύ βοηθητικό κατά τη γνώμη μου.”, “Τα συνδυάζω γιατί και στη ζωή μας πρέπει να σκεφτόμαστε, να είμαστε έξυπνοι για να μπορούμε να προχωρήσουμε, αλλά και στα μαθηματικά για να μπορούμε να λύσουμε κάποιες πράξεις συγκεκριμένες. Μαθηματικά και ζωή, αυτά τα δύο συνδέονται. Η ζωή είναι σαν μια εξίσωση”.



Συζήτηση

- Βιωματικό μάθημα- παιχνίδι
- Η έκφραση, η προβολή και η έκθεση
- Ενεργός συμμετοχή
- Καινούρια πράγματα με νέους τρόπους
- Πειθαρχία
- Βοηθάει τον μαθητή να γίνει καθηγητής και αντίστροφα
- Σύμβολα και σημεία για την έκφραση

αφαιρετικών εννοιών



Συζήτηση

Τα παιδιά θεωρούν ότι, μέσα από την εργασία με αυτούς τους τρόπους, «μπήκαν» στο διδακτικό αντικείμενο και ταυτίστηκαν με τη γνώση και τη δημιουργικότητα η οποία καλλιεργήθηκε μέσα από αυτές τις δράσεις, σε αντιδιαστολή με την παραδοσιακή διδασκαλία και ότι, τελικά, κατανόησαν καλύτερα μέσα από την αυτοκαθορισμένη αναπαράσταση των εννοιών.

