

Virtual Sports Teacher

A Serious Game in higher education



TECHNISCHE
UNIVERSITÄT
DARMSTADT



httc –
Hessian Telemedia Technology
Competence-Center e.V - www.httc.de



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University of Technology Darmstadt

Content

The Project

Motivation

The Game

Game Mastering

Evaluation



The Project – Serious Games in Higher Education



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Project Partners

- Multimedia Communications Lab
University of Technology Darmstadt | Germany
 - Implementation
 - Game Mastering concepts
- Department of Media
University of Applied Science Darmstadt | Germany
 - Artwork, 3D models
 - Motion Capturing
- Institute of Sport Science
University of Technology Darmstadt | Germany
 - Didactical concept
- Institute of Sport Science
Justus Liebig University Giessen | Germany
 - Didactical concept



Motivation

Serious Game for Physical Education students

Hypothesis of advantages of this Serious Game

- Individual motivation – adaptive difficulty and learning context
- Sustainability – use at home and at university
- Scalability – more players can play it than can be taught in a course
- Economy – cheaper and less time-consuming
- Self-efficacy – Avoidance of praxis shock
- Virtuality – No physical consequences of failure



Virtual Sports Teacher – The Game

Game Technology

- 3D – 3rd person game
- Game Engine: Unity3d
- Authoring environment: StoryTec (www.storytec.de)

Narrative Background

- substitute an injured PE teacher
- teach children in physical education
- solve typical tasks and problems

Gameplay

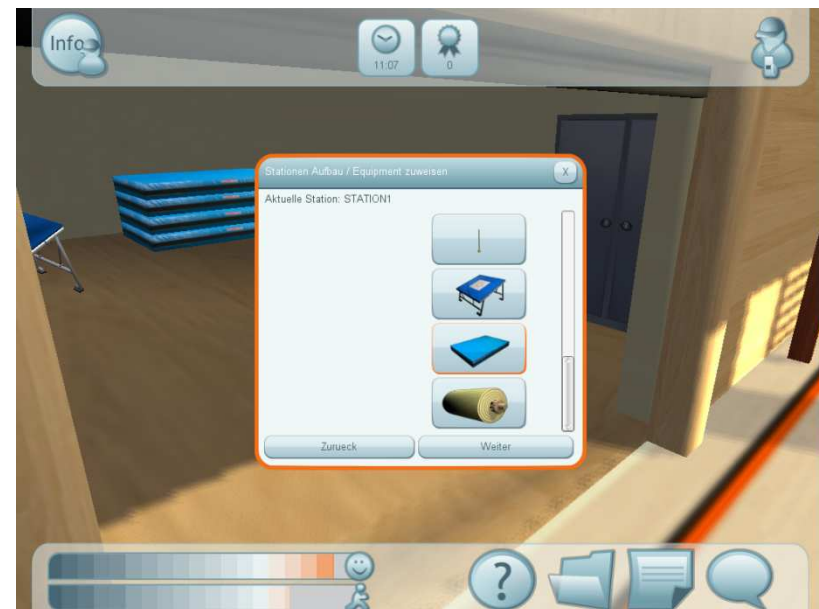
- Preparation - Lesson content: development of the back extension role
- Practice the typical course of a sports lesson
 - Teach children
 - Recognize and correct typical movement errors
- Get Feedback



Virtual Sports Teacher – The Game

Tasks of the Player

- structure and plan a sports lesson
- structure the order of the exercise stations
- assemble the apparatus, choose mats and place them correctly
- Assign pupils to assembling tasks
- decide which assistance to render for which exercise
- choose methods and exercises to teach the students
- detect and correct the main errors of a certain movement (motion capture)
- correct detected errors
- motivate the students
- solve problems like arguments, fights, accidents, etc.



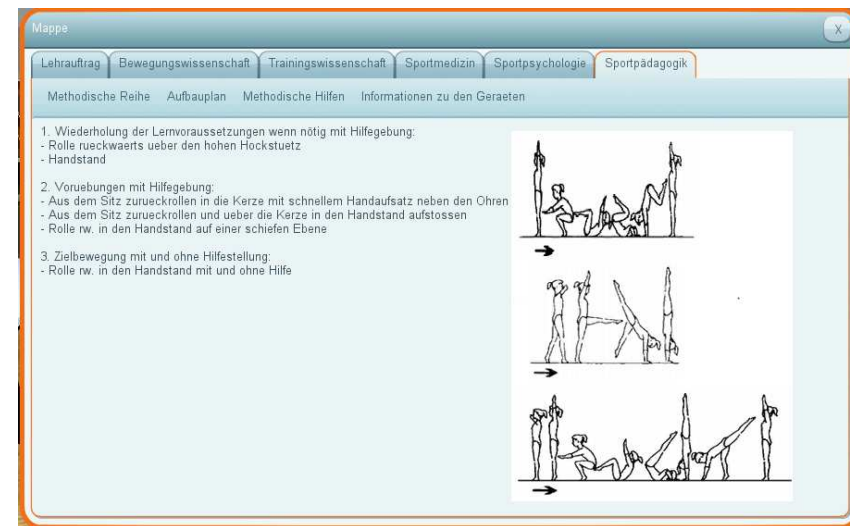
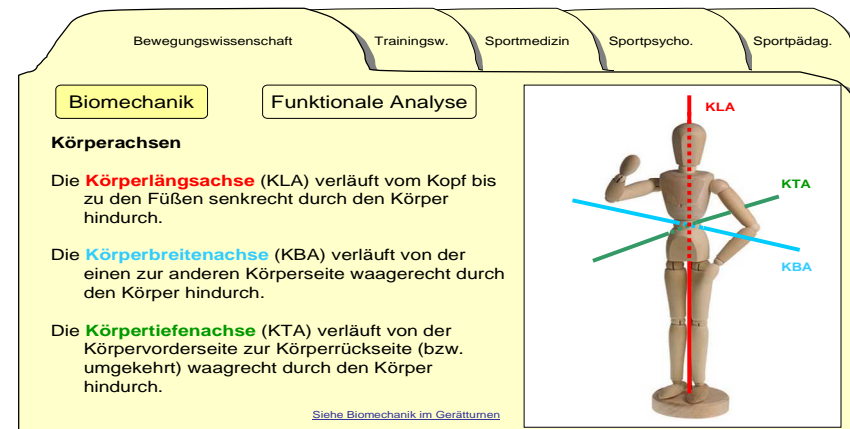
Virtual Sports Teacher – The Game

Effectors and Tools

- Folder of the injured teacher
- Summary sheet
- Experts and other players

Didactical Concept

- Framework: script approach of Hawlitschek, 2009
- execute existing scripts sequentially and hierarchically (the order of actions in a specific situation is linear and fixed.)



Virtual Sports Teacher – Motion Capturing

Creation

- MetricMinds
 - Professional MoCap-Studio with 48 cameras
 - More than 50 sequences
 - ~10 sec. each
- Each sequence is related to
 - 1 exercise
 - 1 error (or correct exercise)



Embedding

- MoCap sequence played whenever a student performs an exercise
- Sequence selected according to student's knowledge and previously corrected errors



Virtual Sports Teacher – Game Mastering

Concept

- Similar to P&P Roleplay Games

Necessary information

- Game time
- Pupils' mood and activity
- Pupil's state
- All player actions
- All events to occur in near future

Tasks

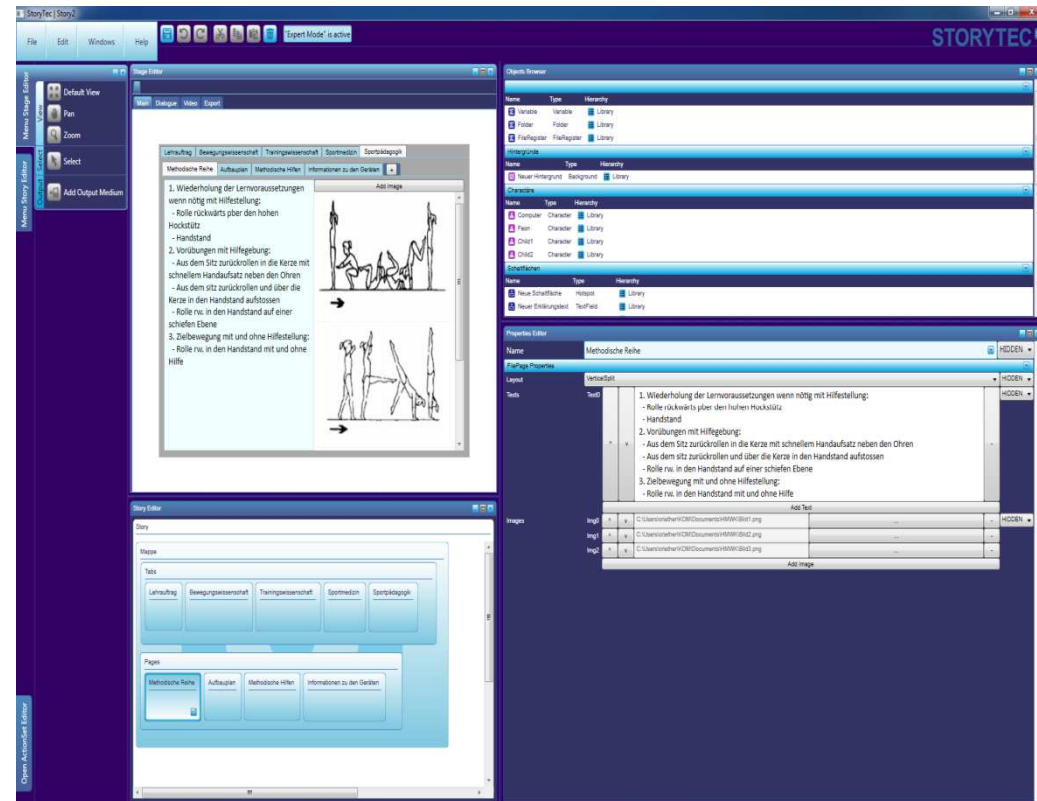
- Assessment at runtime
- Support
- Adaptation of difficulty
- Triggering of events



Virtual Sports Teacher – Features

Additional Features

- Observer mode
 - For additional students (e.g. in class)
- Customizable content
 - Via use of authoring environment StoryTec
 - Creation of own learning scenarios
- Player performance evaluation
 - Extensive feedback about all stages and events of the game

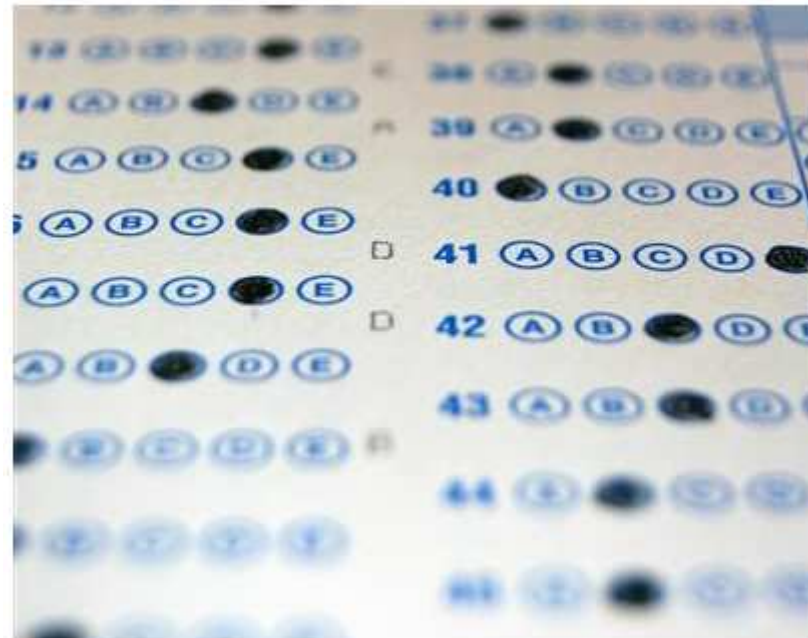


Virtual Sports Teacher – Next Steps

Finishing Implementation

Evaluation

- Game Experience
(September 2011)
- Applicability / Efficiency of learning
(October 2011)
- Game Mastering (October 2011)
- Deployment in a real university
class of PE students



Thank You!



Questions?



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