How future multimedia will augment student interaction, engagement and collaboration
LÆRINGSFESTIVALEN
8th May 2017
NTNU
Kunnskap for en bedre verden
Norgesuniversitetet
Derek Woodgate
UNIVERSITY OF AGDER
the Futures Lab
Georgia State University
COLLEGE OF EDUCATION & HUMAN DEVELOPMENT

“One man’s magic is another man’s engineering”

– Robert Heinlein

- 5 years – 22 PhD, 64 masters
- Domain through Futures Studies
- 15 modules each
- Blended
- Weeklong workshop in middle

Learning in the "Innovation Age": **The Living Learning System**

The Living Learning System - 2025

How is it different from the present?

Present

- Classroom dominates
- Non-integrated curricula
- Traditional subject baseline
- Tests – single institution
- Teachers
- Institutionalized

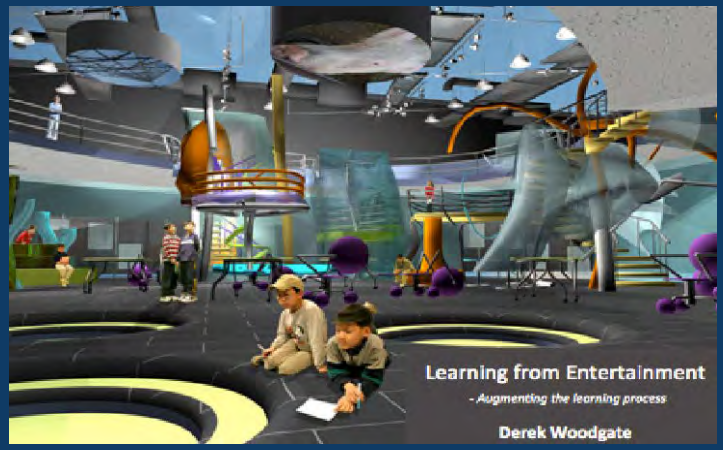
- Authoritarian Teacher centered
- Academic book only
- 2D materials
- Limited experiential learning

Future (2023-2025)

- Fluid learning environments
- Integrated, micro-modules, pathways
- Future work-life needs
- Micro-certs, multi-institution
- Human mentors, robots
- Edu-enterprises, connectors, consortia
- Student-centered
- AI knowledge integrators
- 3D/4D, AR, VR and virtual overlays…
- Simulation, maker spaces, collaborative hubs

Where do we start?

- Structuring course and mapping content?
- How you will assess/evaluate?
- Who are the students?
- Learning goals/outcomes?
- Pedagogical considerations?
- The optimized environment?
- Support tools?
- How to optimize student engagement/mastery?

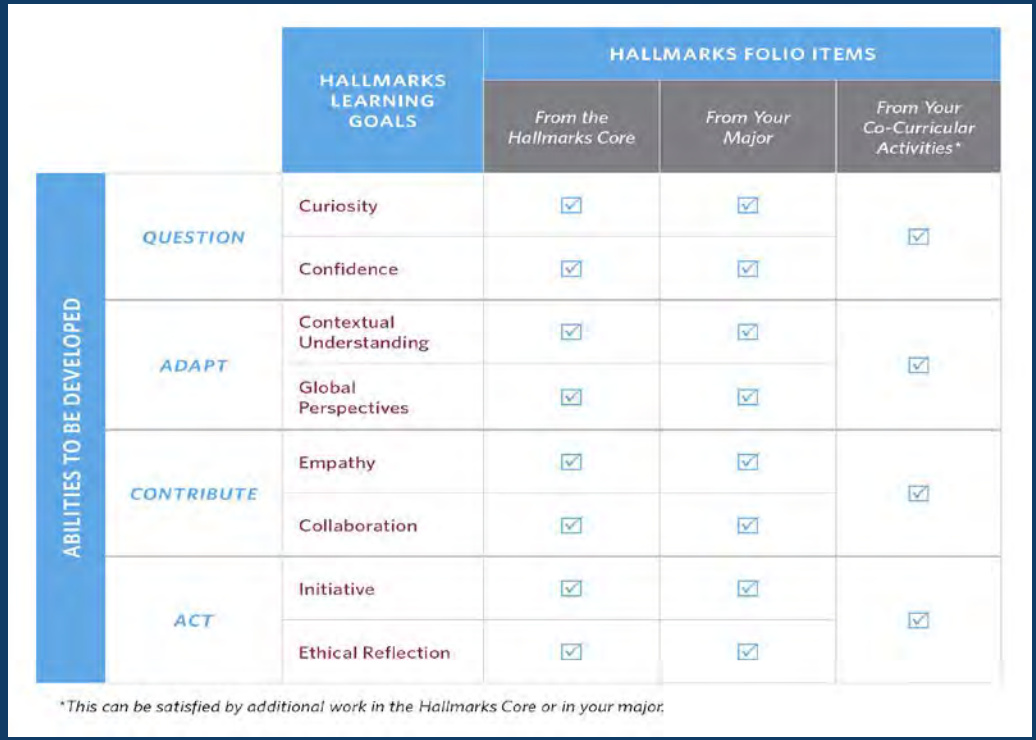


Beyond Seimens; Rotherham and Willingham

Living Learning - Emerging skill repertoire

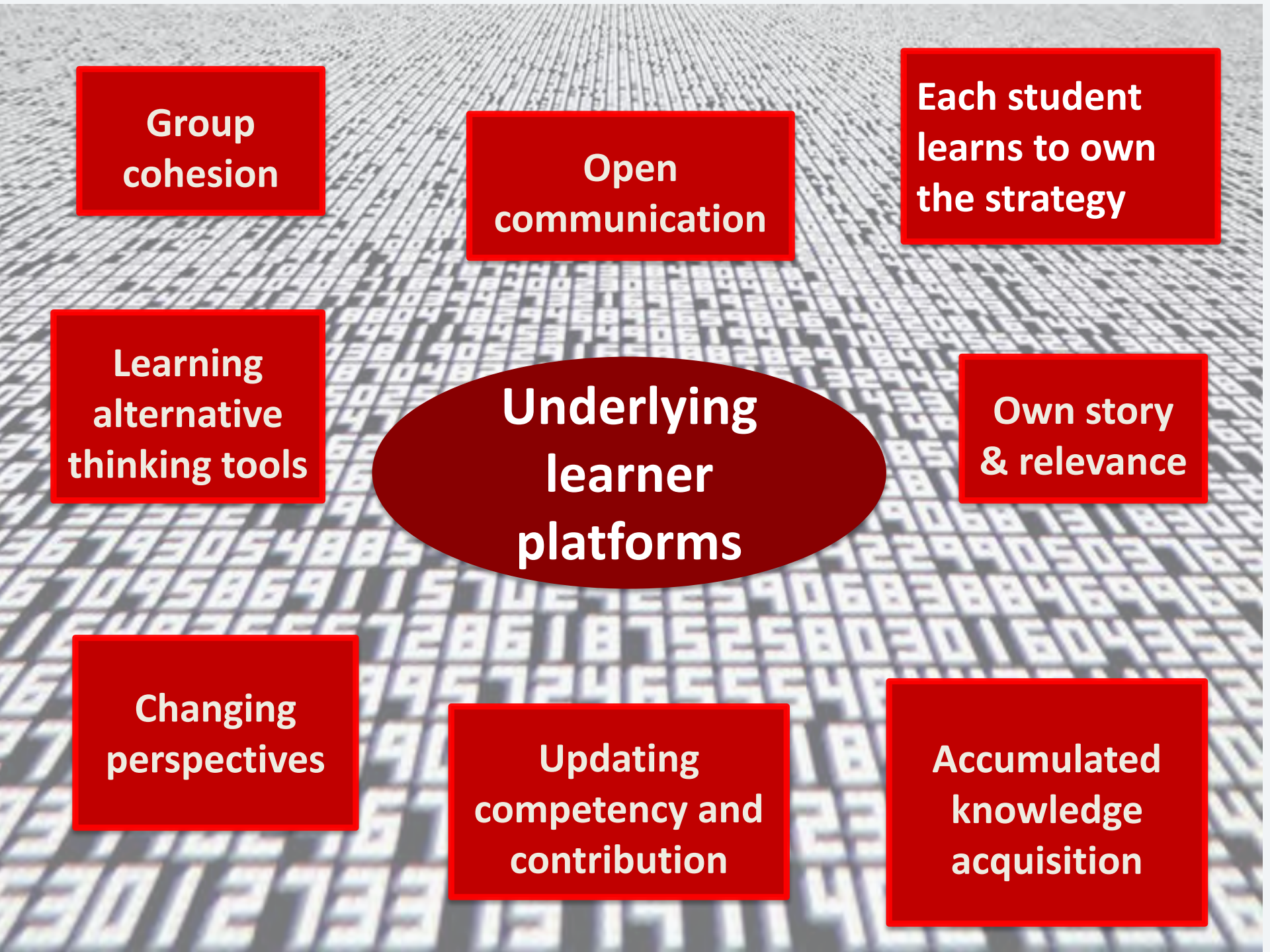
Understanding the emerging learner

- Enhanced human potential
- Multiple identities
- New anchors
- New metaphors, symbols and signifiers
- Personal value
- Learning as lifestyle



ABILITIES TO BE DEVELOPED	HALLMARKS LEARNING GOALS	HALLMARKS FOLIO ITEMS: From the Hallmarks Core	From Your Major	From Your Co-Curricular Activities*
QUESTION	Curiosity	☑	☑	☑
	Confidence	☑	☑	
ADAPT	Contextual Understanding	☑	☑	☑
	Global Perspectives	☑	☑	
CONTRIBUTE	Empathy	☑	☑	☑
	Collaboration	☑	☑	
ACT	Initiative	☑	☑	☑
	Ethical Reflection	☑	☑	

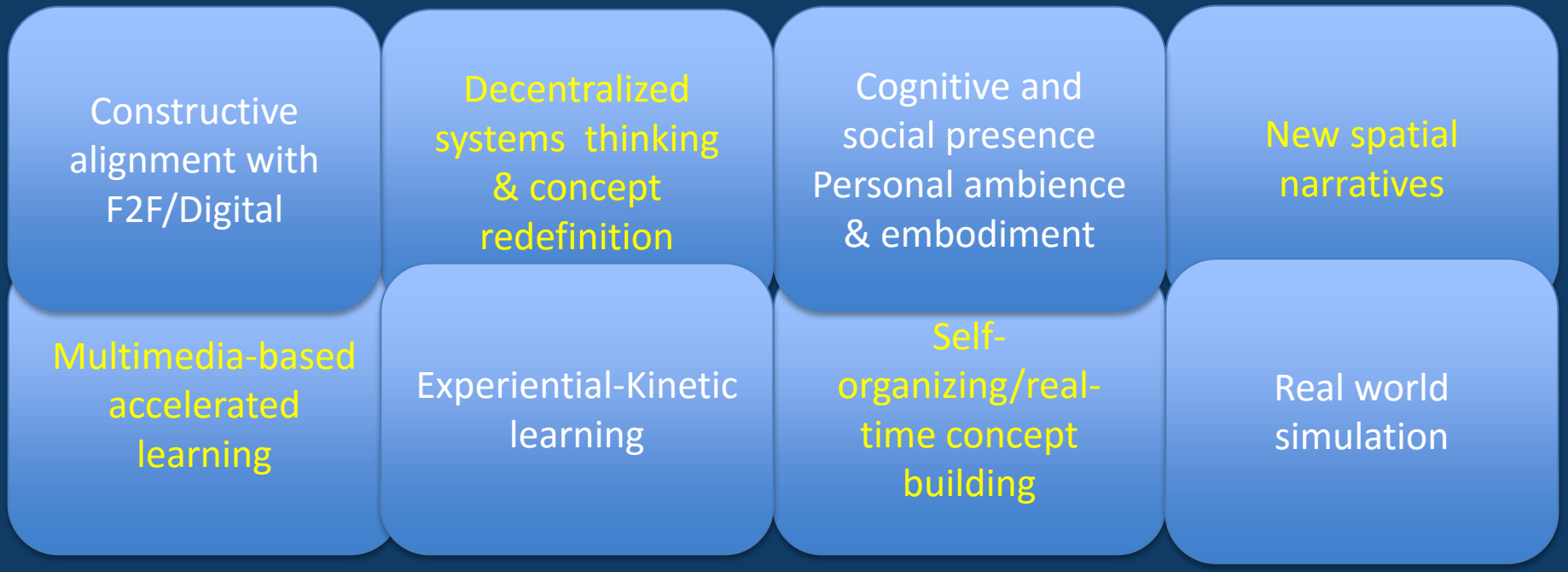
*This can be satisfied by additional work in the Hallmarks Core or in your major.


Group cohesion
Open communication
Each student learns to own the strategy
Learning alternative thinking tools
Underlying learner platforms
Own story & relevance
Changing perspectives
Updating competency and contribution
Accumulated knowledge acquisition

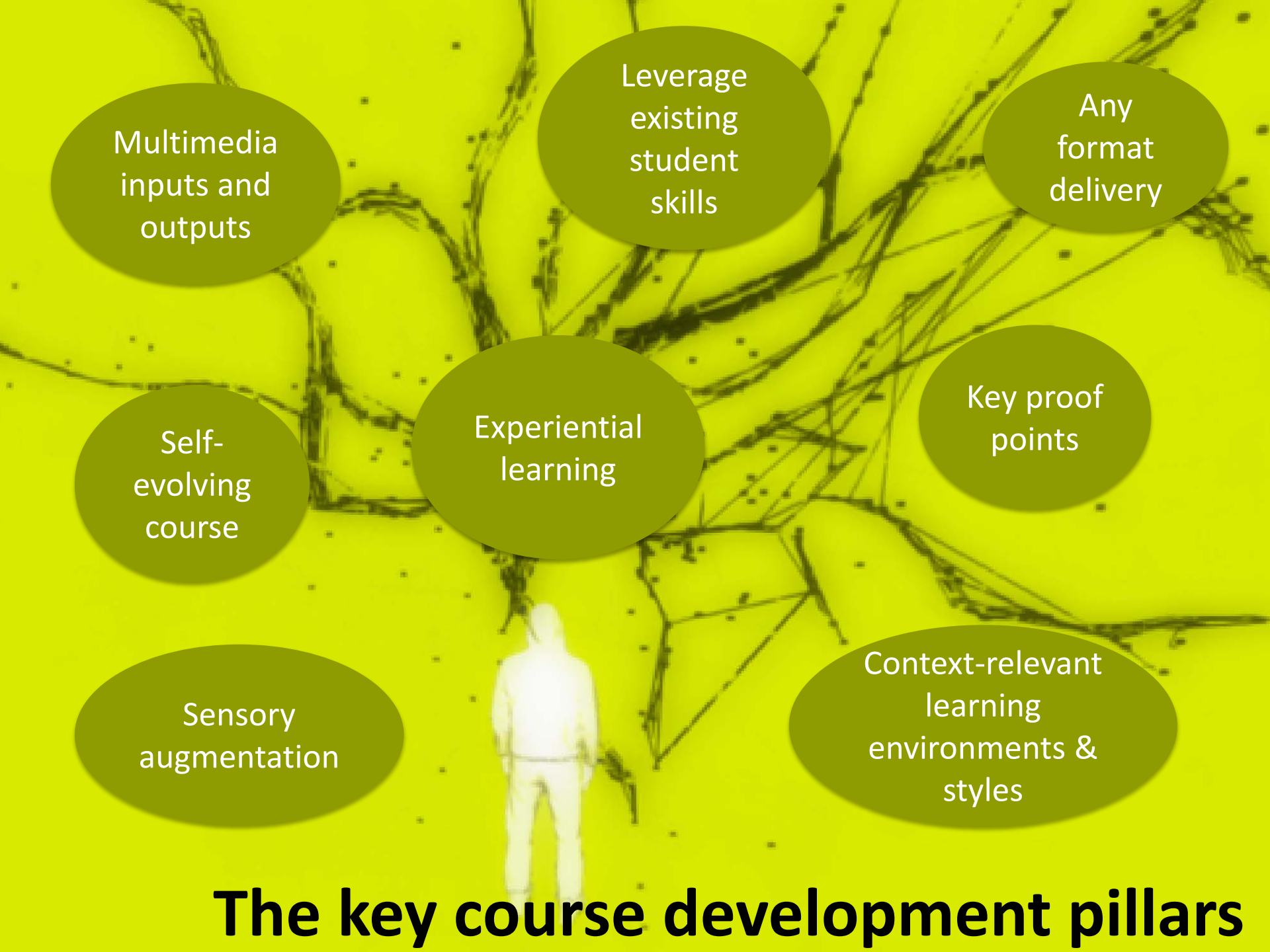
The Living Learning System

Integrative design model

The Living Learning System
Integrative design model

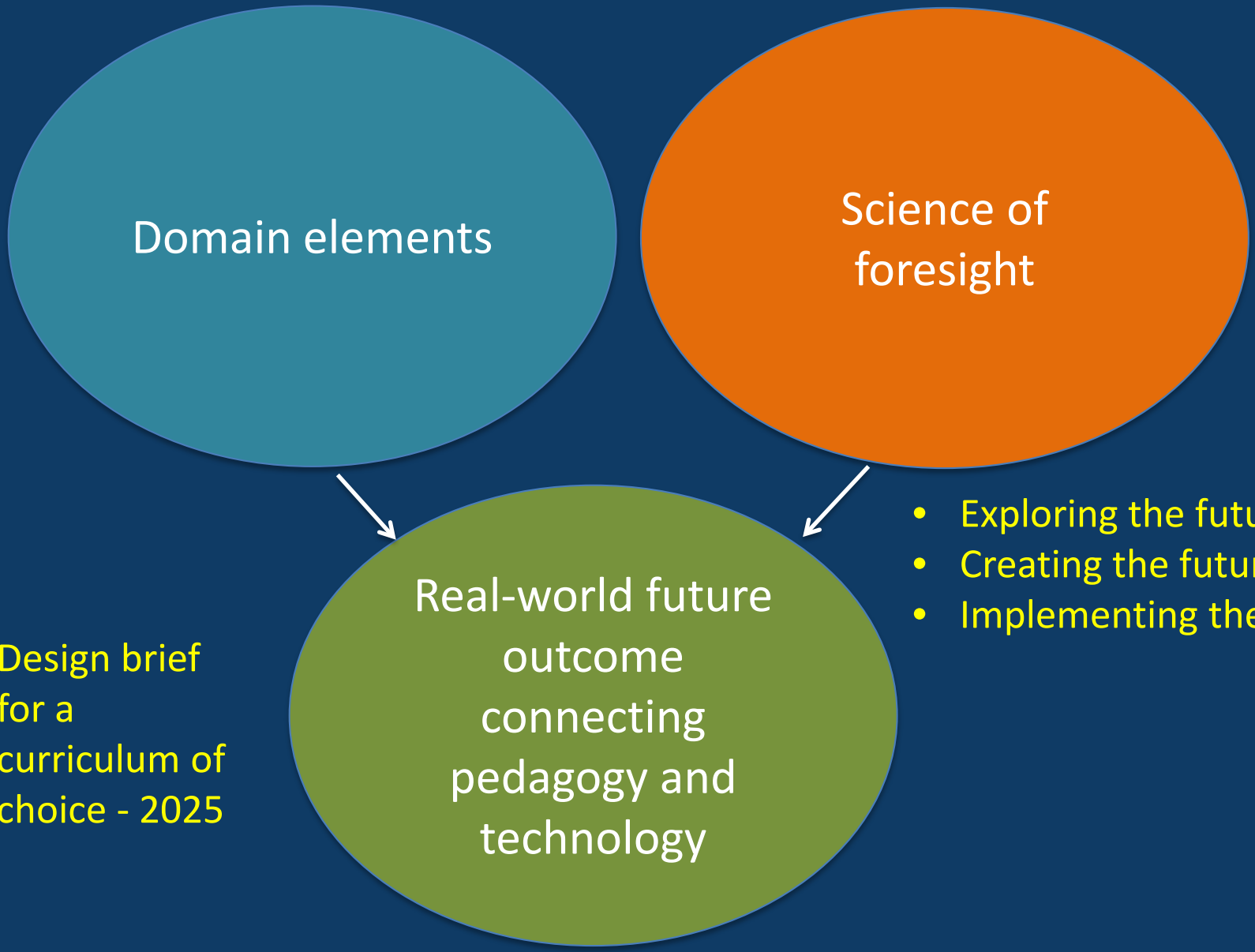


Optimizing design, content, interaction, engagement and implementation



The key course development pillars

Course structure: The future of learning - 2025



Course Objectives

Competency-based assessment

Grading points

Creativity and originality: 25%

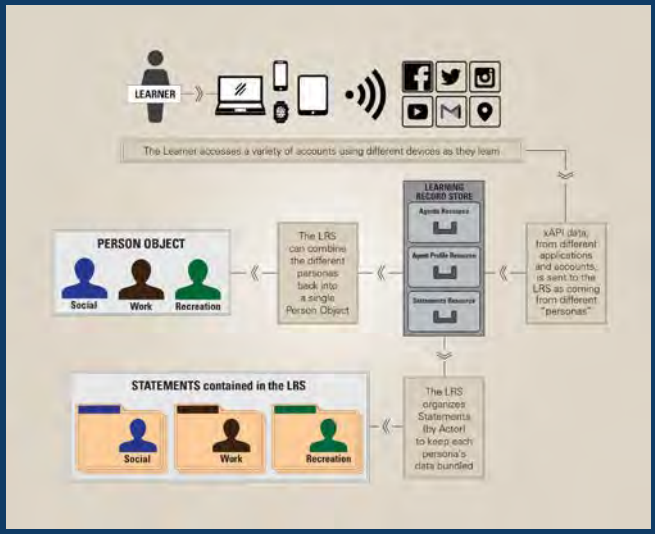
Contribution to future course design: 10%

Future focus: 20%

Analysis, reflection and application: 20%

Depth and breadth of content : 15%

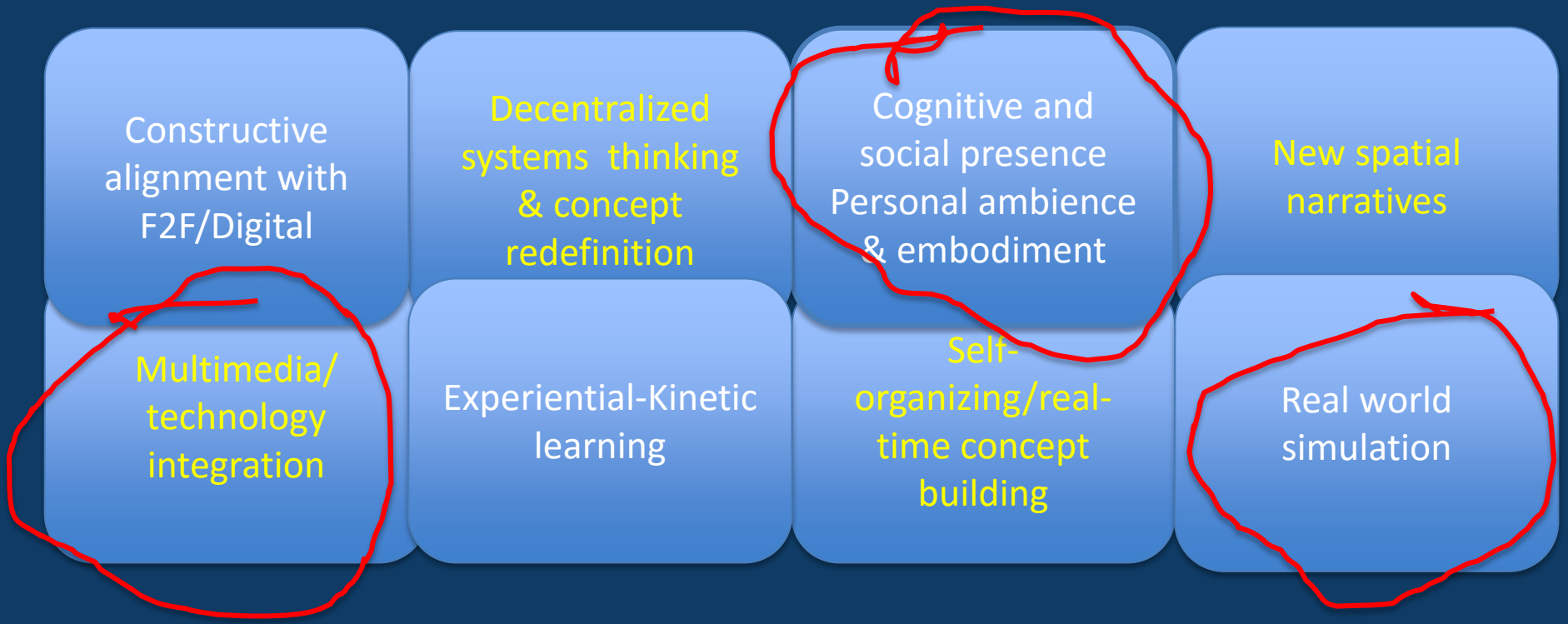
Social intelligence: 10%



Students learning xAPI

The Living Learning System

Integrative design model



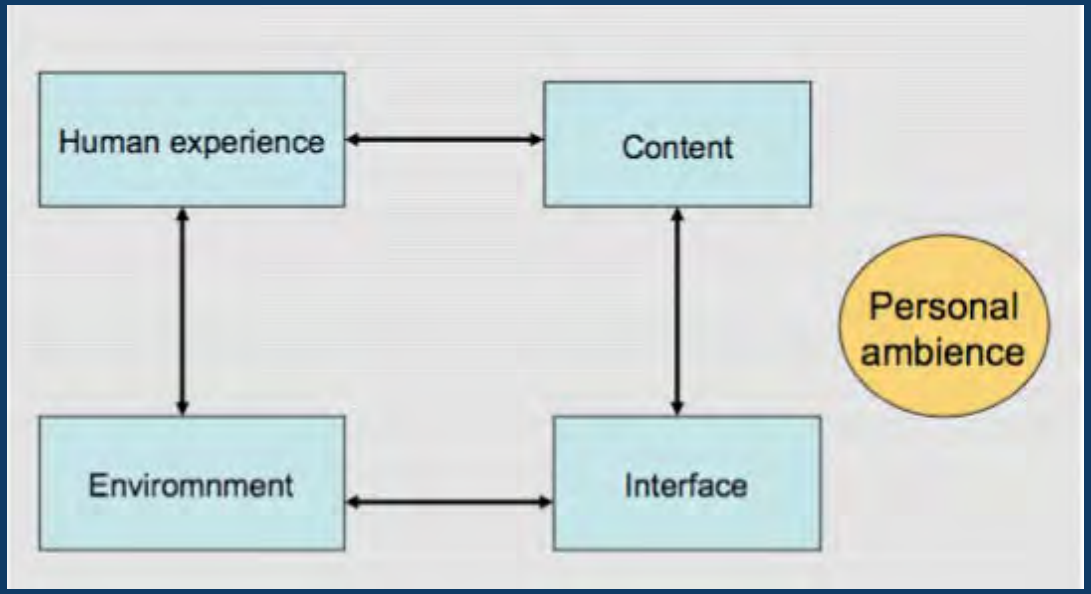
Optimizing interaction, engagement and collaboration

Applying the integrative design model

Cognitive and social presence

Personal ambience & embodiment

Creating engagement through "personal ambience"



Making key assignments personal

Harmonizing positive and negative emotions

Balancing novelty and complexity with existing skills

Derek Woodgate: The Sense event (2012)

An interactive/group learning climate

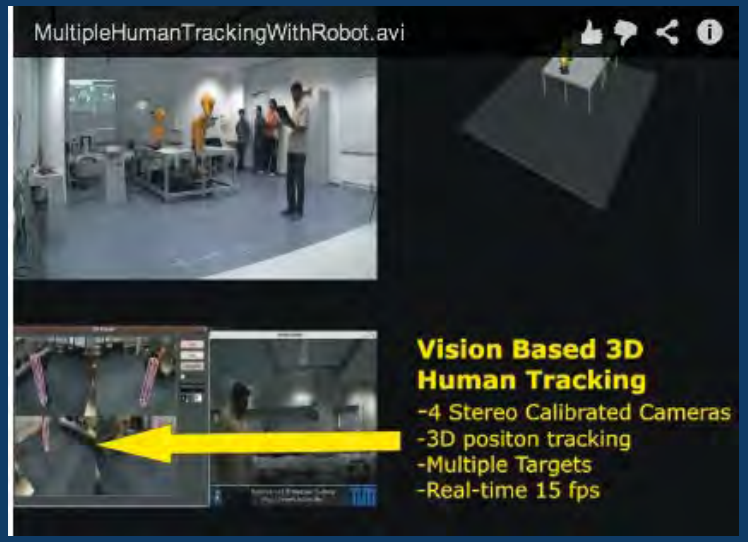
- Sense of creating and contributing to the future
- Open discourse and debate – teams of mixed skills
- Studio student to student interviews
- Testing and sharing feedback on learning tools
- A learning narrative built by students around four elements, namely:
  - Minimal assumptions
  - Unfinished artifacts
  - Group success
  - Become their own story

Applying the integrative design model

Multimedia/technology integration

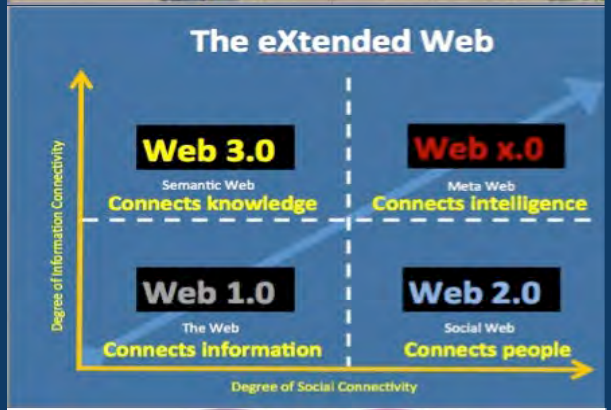
The Media Lab/Learning Lab Available tech:

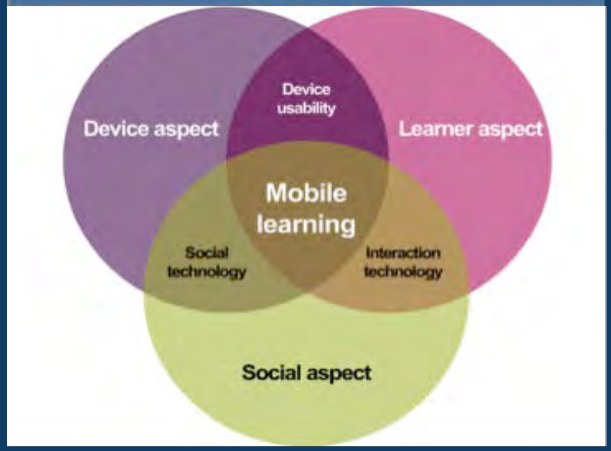
Visual tracking, robot cameras, tools for scene development and human interaction with virtual objects. VR and AR, virtual world sandbox, holograms and VJ mapping, avatar building, software platforms, wearables, AI...



Technological change

- Gamification
- Location-based Learning
- Augmented Reality
- Wearable Learning
- Intelligent Environments
- Nanotechnology



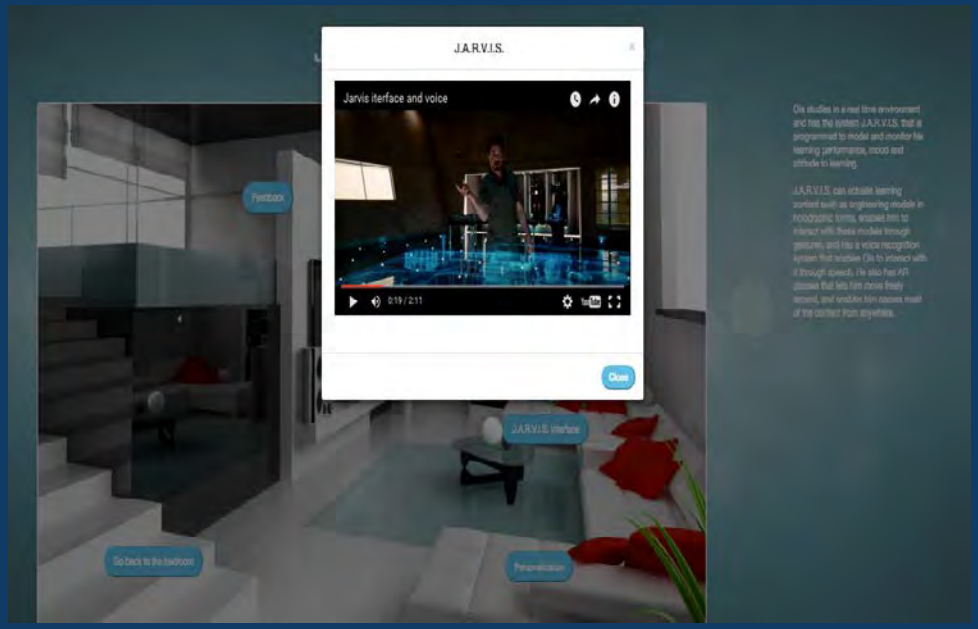


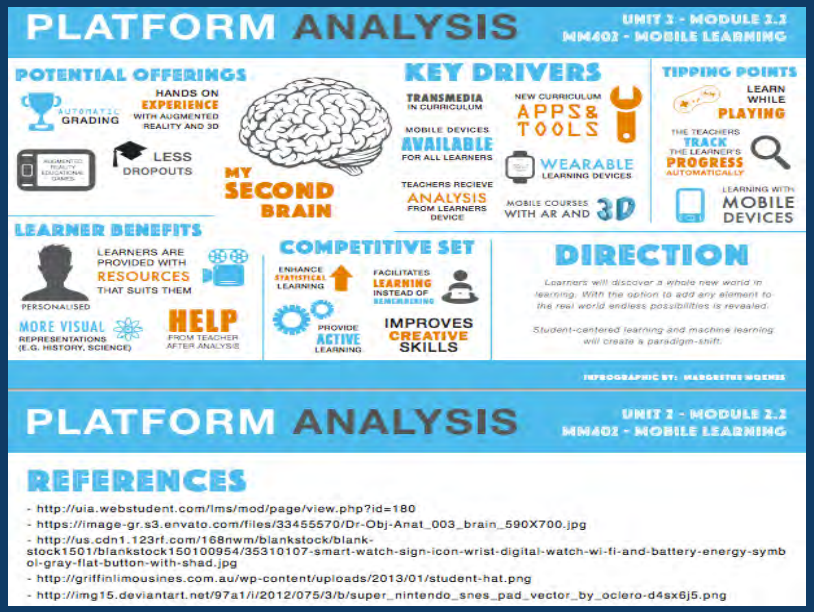
Technological change

- Augmented Virtuality
- Data Mining, Informatics, and Data Visualisation
- Advanced intelligent learning tools and displays
- Learning Implants and brain-computer interfaces
- Fluid interfaces and interactive haptics

Learning Technologies integration

- Determining the relevant integrated multimodal academic activities and cadence
- Create a variety of context relevant learning environments





Applying the integrative design model

Real-world simulation

Living the future learning experience

- Multiple critical change agents
- STEEP (Society, Technology, Environment, Economy, Politics)
- Paradoxes and hybrids
- Reconceptualization

Rhizomatic thinking meets "think like a DJ"

Develop Concept platforms

FUTURE TRIGGER	NEW TRIGGER AS CONCEPT PLATFORM
Student is king	Content is the learner
Smaller is bigger	Flexible is better
Devices - extended brain	My second brain
Learning reconceptualised	Learning as self-extension
Cognitive feedback / machine assess-ment	The student as data
Experiential / experimental	Student as an immersive interface
Learning enterprises	Towards community based learning

Custom-tailored learning – You are the curriculum

Aperture Learning

Access, analysis, processing over retention

Learning as self-extension

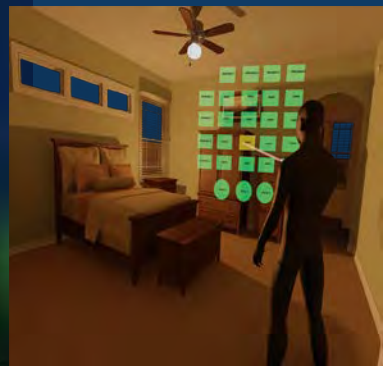
Adaptive learning ecosystem

Living Classroom – Learning Unleashed

Alternative knowledge suppliers

Living Learning: The Art of Awesome

- The scenario can be created and delivered in a multitude of formats:
- Conventional storytelling: “A day in the life"
- Multimedia 3D world visualization
- Interactive, immersive and simulation
- Gamification
- Multimedia and multisensory performance pieces



Future scenarios – 2025

Future Scenarios- 2025

Mobile Learning for Education
UNIT THREE
Creating a design brief for your mlearning project
Mobile Learning for Education
UNIT THREE
3.1
Learning Curricula Design Principles
Course Home
Mobile Learning for Education
UNIT THREE
Module 3.2
MOBILE LEARNING TOOLKIT

Learning languages 2025

Technology – Virtual reality

Mobile learning technology and devices are critical for enhancing and creating authentic language learning situations in 2025.

Many learners do not have the opportunity to travel to different countries where the target language is spoken, making VR technology an important tool for simulating real-life locations and situations.

Virtual reality technology today can generate images, sounds and other sensations such as haptics. In 2025 the technology and devices will have developed even further, with more advanced hardware and software, further enabling us to experience immersive and engaging learning situations.

The virtual learning situations in the course will be augmented, where information such as translations, descriptive images, tips and feedback can be provided to the learners as an overlay over the virtual reality. This will further enable the learners to take control over their own learning as they can actively work on improving and expanding their vocabulary, pronunciation, sentence structure etc.

Technology – Frame capture and virtual course room

The VR experience will be frame captured, enabling the learners (and mentors) to re-experience the learning situation. The act of re-experiencing provides a greater basis for reflection and self-assessment for the learners, and formative assessment provided by the mentor.

There will be a virtual course room which will serve as a meeting place for the participants and mentors (visualised as avatars), in addition to the contact through other course content and the LMS. The course room will be adaptive, enabling the participants and mentors to modify the virtual environment and design narratives, which will serve as a learning activity in module 4.

Technology – xAPI and AI agents

Through the use of experience API (xAPI) software, new types of learning data will be tracked and captured, such as complex interactions and mood (body language), in order to better provide personalized learning experiences and assessment.

The data gathered is participant in adjusting the difficulty of the units to the individual learner's needs.

Most of the course content will make use of AI agents within the virtual environments. These agents serve as the virtual scenarios' inhabitants that the learners can interact with in their learning journeys. The agents will adapt the information and responses given based on the learner's proficiency (difficulty level) in order to provide the learner with proper scaffolding. In unit 4 the learners will be able to place modifiable AI agents in the course room, where they will act as story characters in the learners' interactive narratives.

Other

The course will also enable the learners to use different media and technology based on their own preference, such as photography, music and video, in their 'solving' of both larger and smaller learning activities within various units. This furthers the course as student-centred as the content can adapt to learner skills, knowledge and interests, thus increasing student engagement and retention.

Support and assessment

The learners will throughout the course be supported and given feedback by mentors and AI agents, which will aid the learners in their learning process. The AI agents will as previously mentioned provide appropriate scaffolding for the learners during the virtual scenarios. The mentors will often participate in the virtual environments alongside the learners where they can serve as additional guides or facilitators. The mentors are also responsible for providing the learners with the necessary support and feedback, whether it's of technical, pedagogical or didactical nature. They are additionally responsible for creating and maintain good learning environments that promote collaboration and communication among the learners.

Experience API will in addition to providing personalized learning experiences provide the mentors with crucial data that can be used for formative assessment.

The course has no traditional testing (e.g. tests, exams) to measure learner proficiency. The learners are evaluated based on their continuous performance in the learning activities, as the activities provide the learners with authentic situations where they use their knowledge and skills to reach set goals and objectives.

Through frame capture of the VR experiences, the learners are prompted to analyse and evaluate their own learning process in order to find potential improvement areas.

The course are using our own LMS as a portal for you education, this is where the learners can see their progression, find task and assignments. Most of this can also be accessible verbally from the learners wearable AI tutor

ABOUT THE COURSE

This is a language course set in 2025, the course is provided by a company, using student as data to provide adaptive learning. The company/course is using data gathering from users, to customize each individual learning path. The course takes advantage of the available technology in the year 2025, using brain implants for monitoring, wearable devices, AI-technology and machine learning for analysing, and to provide a digital tutor for the learners. All accessible from the course learning management system on their mobile and home devices.

TECHNOLOGY

Our main technology is our deep analysing and monitoring AI software functioning as the backbone for the course allowing us to customize the learning experience for the individual learner and make the learning process fully adaptive.

The software is monitoring the result and body data from the learners, to customize the course for the learners, by looking for triggers of motivation and what delivery sources and task the learners get the best result from.

- **Our delivery source database allows for the adaptability to learners need.**
- **Compatibility with the monitoring hardware the learners already own.**
- **To satisfy today's learners our course is compatible with all mobile and home devices, giving the flexibility a learner need, allowing you to studied when where and how you want.**

VEMEC

Virtual Experiential Mechanical Engineering Course

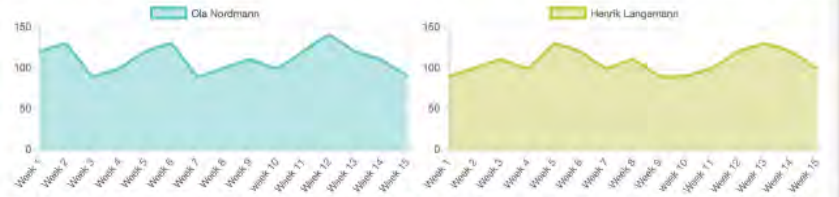
Introduction

Learning is changing. And in most cases, it is changing for the better. As new technologies emerge, it is up to us to grasp the new possibilities they bring, and shape these technologies into revolutionary learning tools that will define the process of learning in the years to come. This design brief is my attempt at creating a course that will not only use emerging technology, but use it in a way to make the whole learning process smarter and more intuitive.

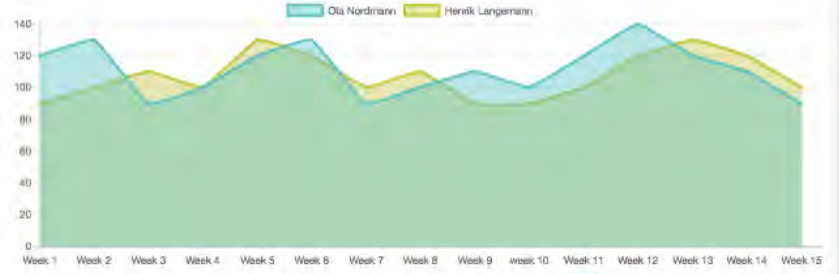
Through the course of the MM-402 Mobile Learning course, I have refined and developed this idea from the simplicity of an interesting app into the idea for a full curriculum. This has happened through many different processes of future thinking and insight, and this has helped me think about the future in a less linear and rigid way, and think more outside of the box.

My hope for this design brief is that you will not only find it interesting, but that it will inspire additional ideas for the future of learning, and give a foundation on which to build a real-life course based on this idea.

Throughout this course, the student activities will be analyzed and evaluated by the AI and tutors. The students will also be able to check on their progress, as well as areas they might need to focus more o themselves. By providing this kind of feedback directly to each individual student, the learning experie will be more personalized and more focused on what each individual student needs.



The AI and tutor will use this data to compare students and how they are doing, assigning different tasks to different students depending on their individual needs. The goal of this evaluation is not grading, but improving the learning the students are receiving. The end of module reports gives the student a chance to voice their opinion on what they have learned, further enabling the AI and tutor to enhance the learning experience.



While this system is useful for the AI and tutor to analyze performance after the fact, the system will

Virtual classroom

Click on the box to start video example

The virtual classrooms can consist of just about anything. They can be either passive and active, depending on the subject. The video above is an example of a passive virtual classroom, where the learner experiences a scenario from WW2.

AR assistance

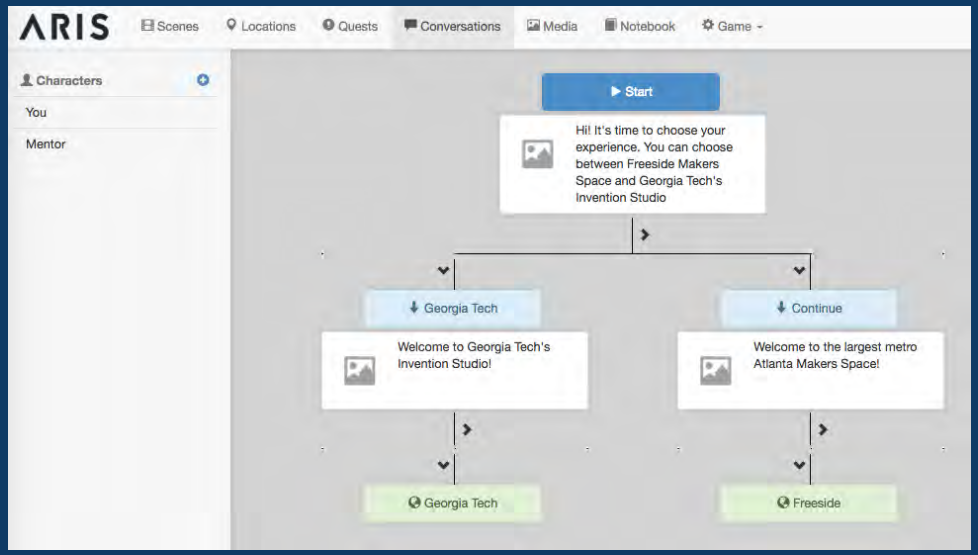
Using AR glasses or lenses

When going on excursions and generally for learner on the move, AR glasses and lenses would be the preferred solution. With this AR would act as an assistant in the learning, bringing the information to the learner.

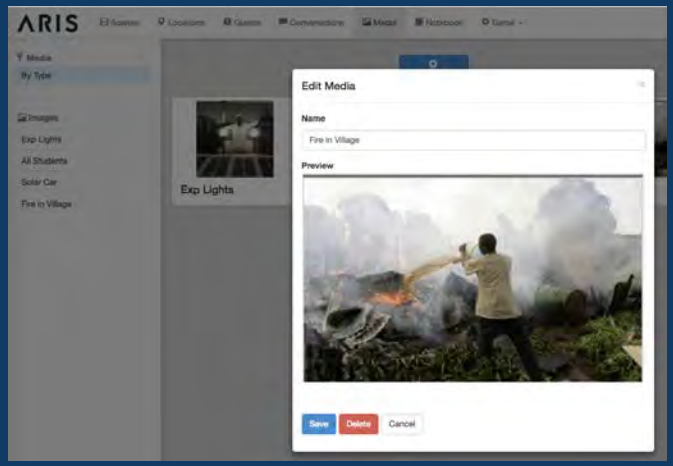
Device assitance - Smartphon

An alternative to AR glasses/lenses would be smart devices such as a smart-phone. The smart devices would be able to recreate historical objects/buildings/ landscapes, like shown above.

VR game to teach and feel experiential learning

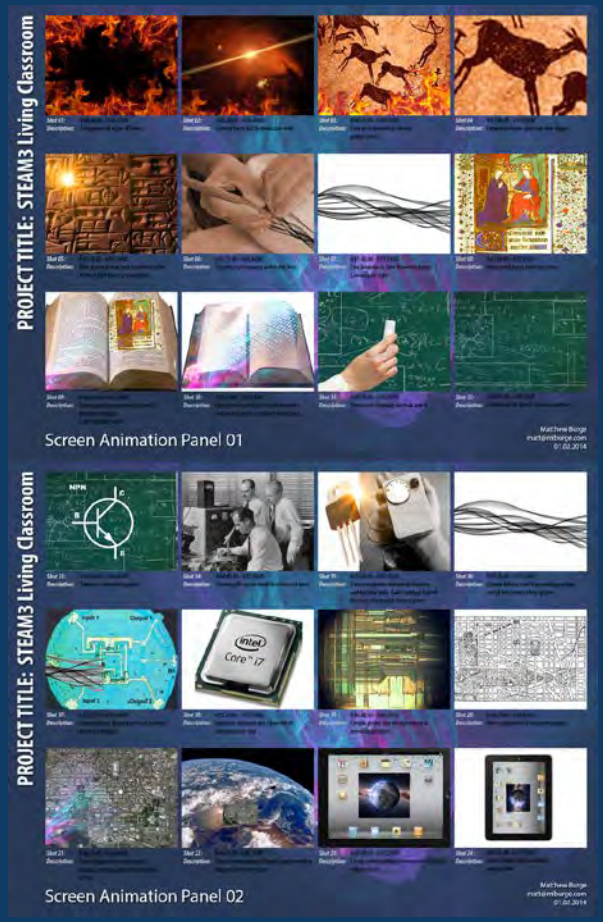


A conversation is designed to allow the game player to choose their VR experience either at Georgia Tech's Invention Studio or Freeside Maker Space.

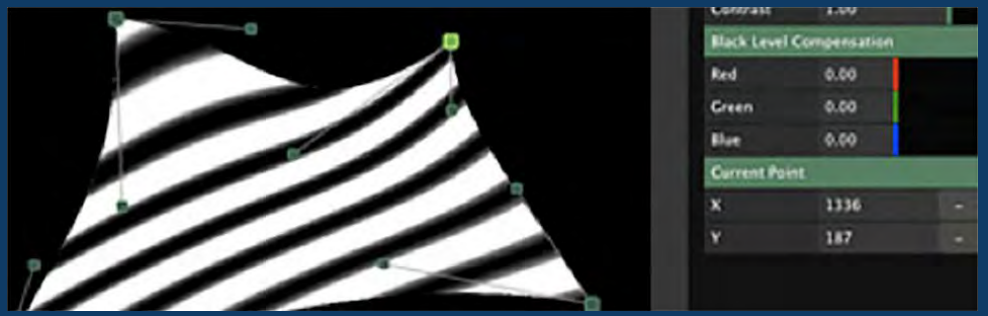


Living Classroom History of Multimedia

Shape of a book – projection mapping



The mapped sculpture shape shifted and content shifted to depict the multiple potential types of learning sources and environments in the future as well as the changes in the way we will learn and teach.



Think like a DJ

Deconstruct
Mutate
Spin
Transform
Migrate
Displace
Simulate
Fuse
Translate
Recombine

➔ ***Transformative concepts***

Thank you