ImREAL

Immersive Reflective Experience-based Adaptive Learning

S-ROLE Workshop

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How to Augment Simulated Environments by Services supporting Self-regulated Learning?

A Baseline Study

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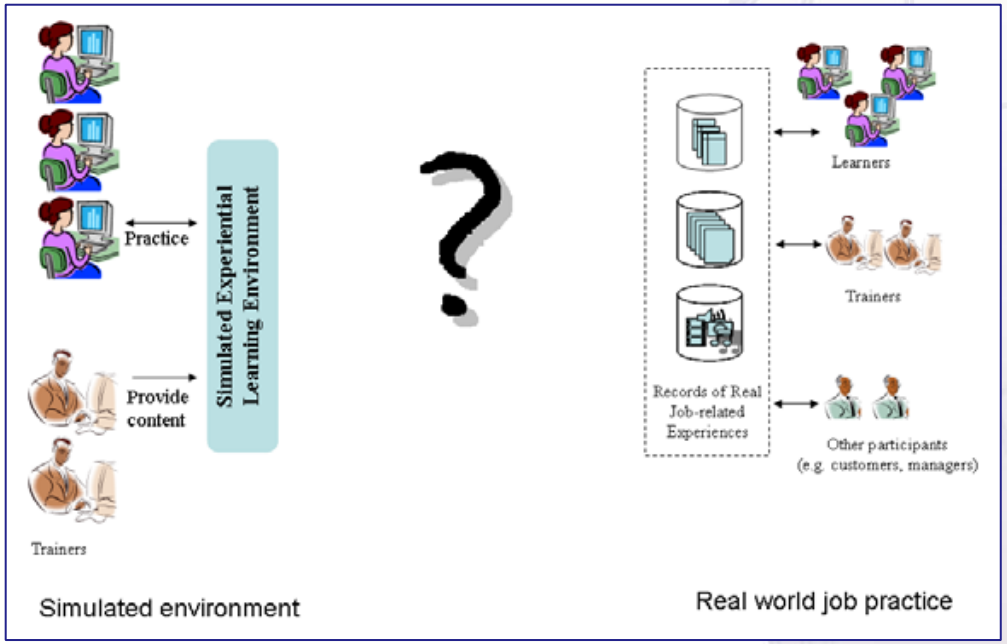
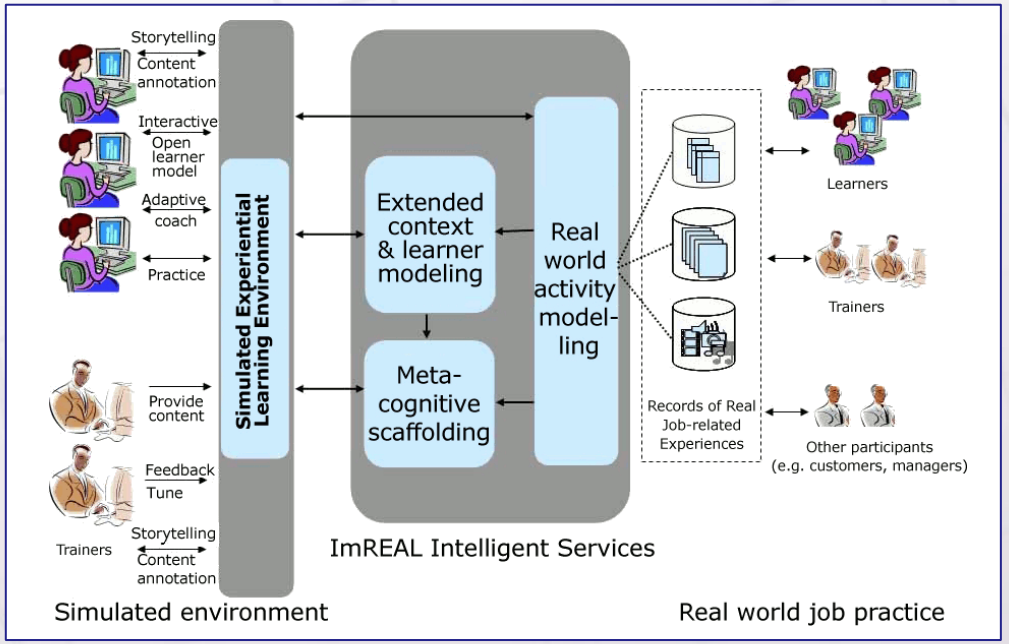
SEVENTH FRAMEWORK PROGRAMME

Rationale of ImREAL

- create effective virtual reality training simulation tools that adapt to trainees' past experiences or preconceptions
- closing the gap between the 'real-world' and the 'virtual-world'

- Services should respond to users' behaviour and adapt accordingly to the user model based on a pedagogical model
- Create services that can be connected to different simulators





Self-Regulated Learning (SRL)

- SRL is composed of three cyclic learning phases: Forethought, Learning, Reflection (Zimmermann, 2002)
- Good SR learners use appropriate learning strategies and techniques
- Good SR learners achieve

  better learning results and

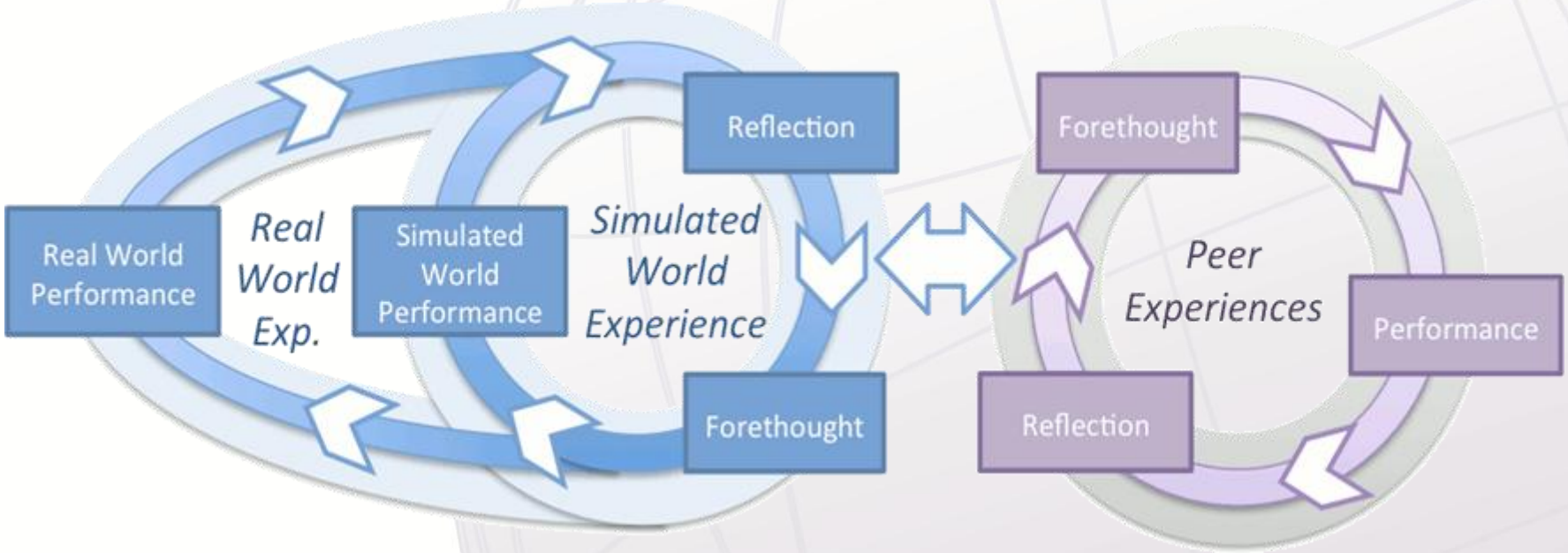
  are more motivated to learn

  (Zimmerman, 2002; Veenmann, 2011)

"I expect you all to be independent, innovative, critical thinkers who will do exactly as I say!"

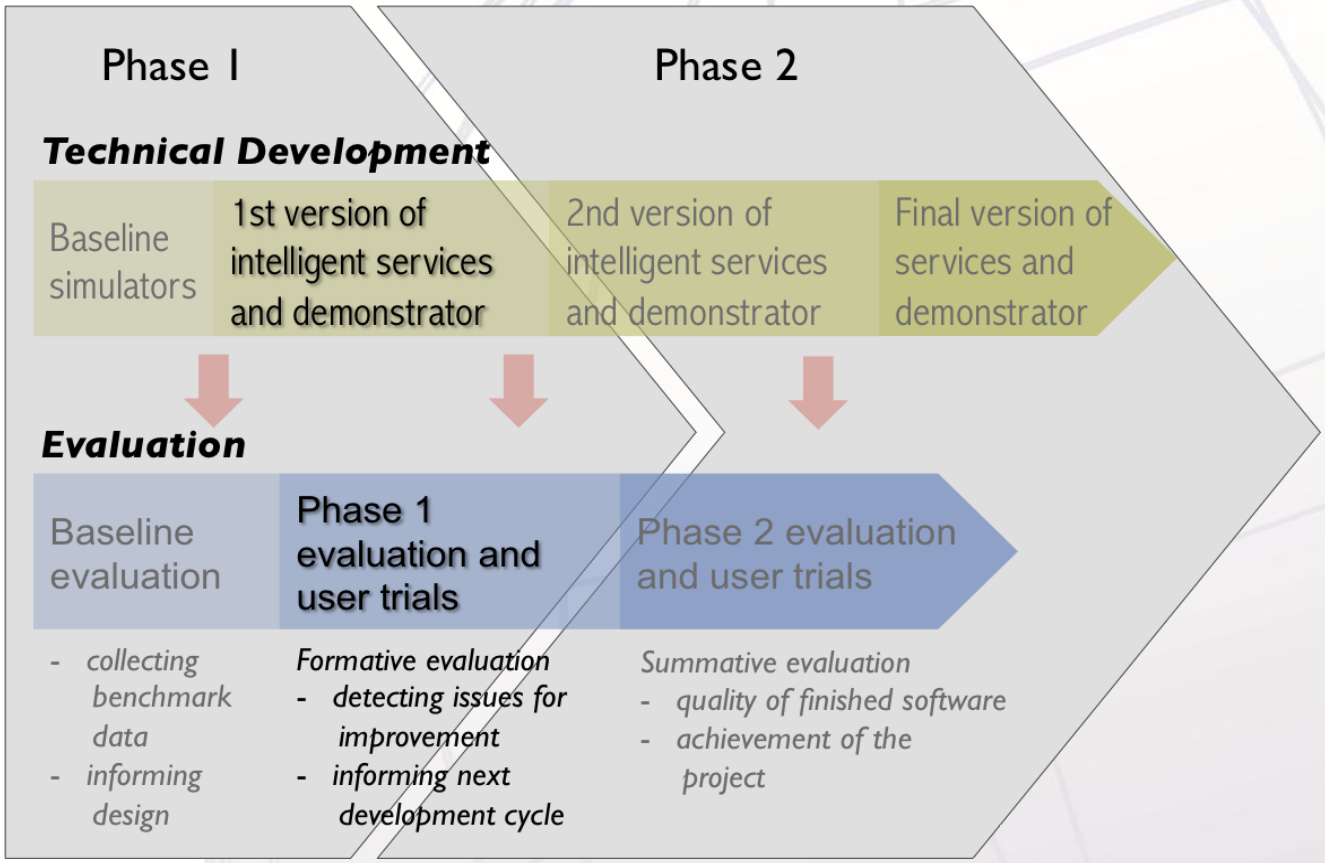
Pedagogical framework in ImREAL

Integrated SRL cycles + Peer experience



(Hetzner et al., 2011)

Evaluation timeline



Three services:

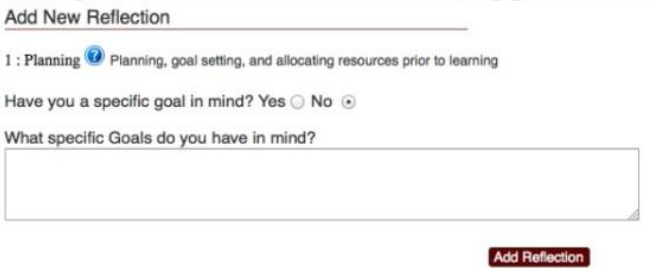
- Metacognitive Scaffolding (MSS)
- Intelligent Content Assembly (I-CAW)
- Web-based services for semantic enrichment (U-SEM)

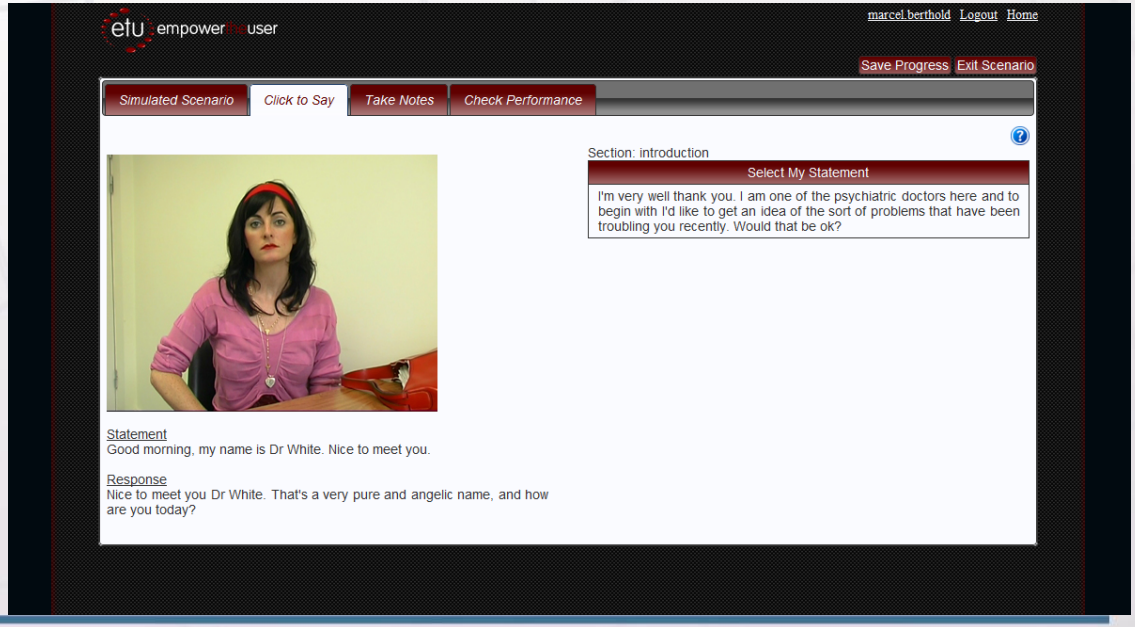
Metacognitive Scaffolding Service (MSS)

- Addressing evaluation question
  - Can SRL be enhanced through Metacognitive Scaffolding Services (MSS)?
- Formative evaluation approach
- Research foci of ImREAL MSS

→ Integrated ImREAL services

- Investigate: Impact on SRL reports, behaviour, qualitative feedback





http://www.empowertheuser.ie

Method

- TCD Medical students *N* =143 (*N*=131)
- Integration of the MSS in ETU simulator
- Comparison of baseline evaluation results (no MSS) and ETU simulator with MSS (providing of thinking prompts)
- Questionnaire on SRL (Fill Giordano, Lietzenberger & Berthold, 2010)
  - 54 items
  - 6 main and 3 sub scales on metacognitive, cognitive and motivational strategies
  - Internal reliability: *r* =.65-82

Results

Experience

- No experience with ETU simulator
- Experienced with interviews (97 %)
- limited experience with interviewing psychiatric patients (15 %)

ETU Simulator log data

- Duration in the simulator: 15.45 min (17.89)
- Scores 27.61 points (31.34)
- Went only through depression scenario during 1st user trial (mania and depression)
- No correlation with SRL scales

SRL results

- No change in SRL compared to baseline
- Highest usage of elaboration strategies

MSS

- Comparison of expected and empirical MSS prompt distribution
- More scaffolds on Information Management
- Less scaffolds on reflection

Discussion on results

SRL

- No correlation of log-data and SRL reports were observed – needs to be investigated why?
- No changes in SRL → long-term process

MSS

- learners seem to need more assistance in effectively processing information by hints to use more organizational, elaborative, summarizing or selective learning strategies
- rather confident in the reflection phase and wave the offer of scaffolds

Discussion on results

Lessons learnt

- Provide MS at appropriate times
- Keep learners longer in simulation
- Provide additional services to promote SRL

Outlook

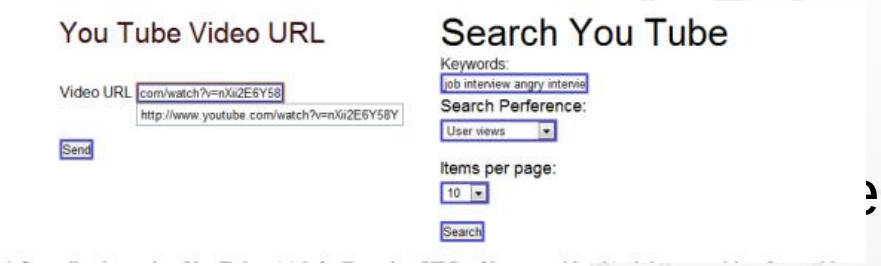
- Define indicators for SRL to provide MS at appropriate time
  - Also to avoid questionnaires
- If possible run post interview phase and provide QSRL again
- 2nd user trial → implementation of Affective MS
- Comparison of baseline evaluation, 1st and 2nd user trial

Evaluation of I-CAW

Evaluation question addressed

- Intelligent Content Assembly Workbench – semantic content browser to facilitate informal learning

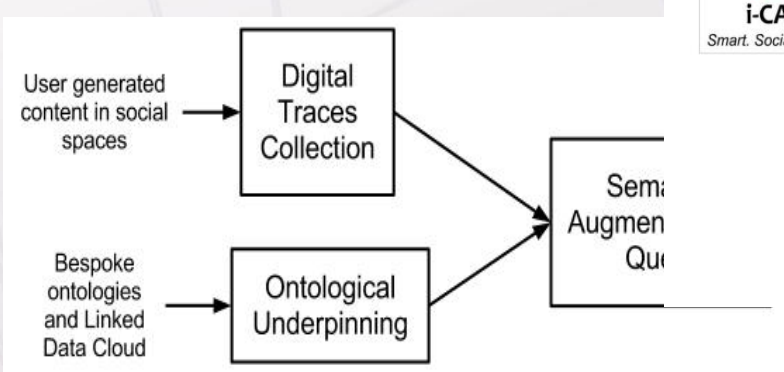
Method



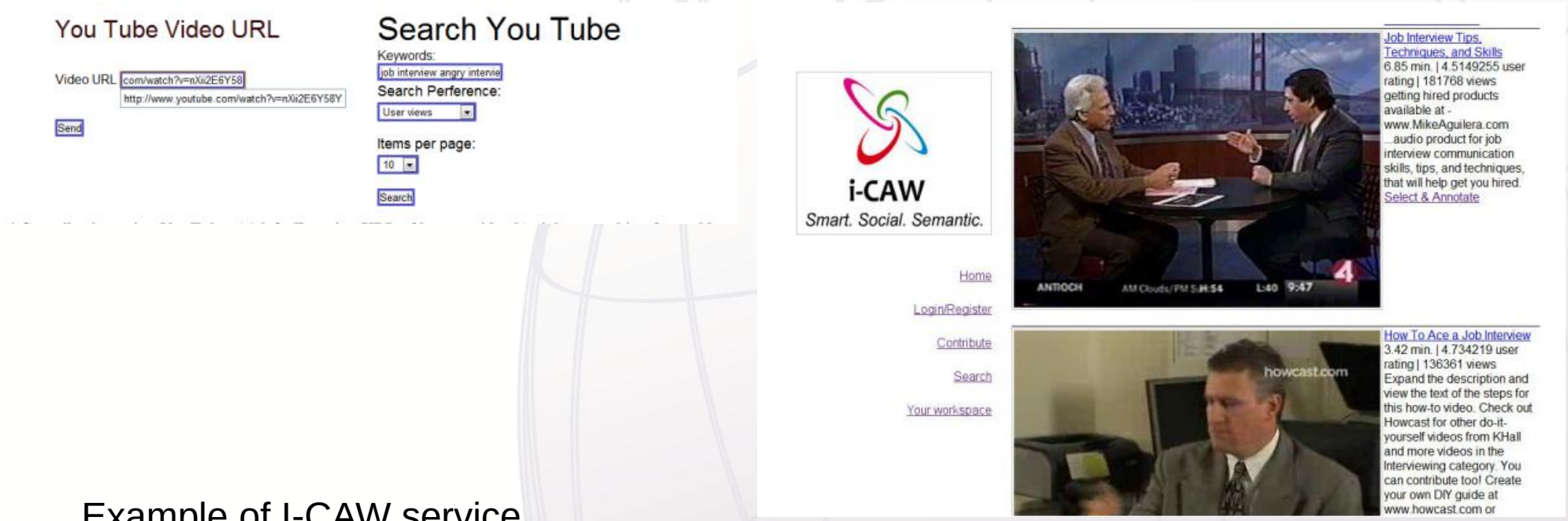
ImREAL content collection

e architecture)

- Signposting
  - All facts
  - Key facts
  - overview
- Prompts
  - Similarity
  - contradictory



Evaluation of I-CAW



Example of I-CAW service

Evaluation of I-CAW

Results:

- Semantically augmented digital traces
  - provide valuable authentic examples
  - offer different point of views (filtered YouTube comments)
  - Provide stimulus for content contribution
- Nudges – Signposting
  - All facts: mixed feedback on usefulness
  - Key facts: informative, helpful and relevant
  - Overview: Helpful starting point for exploration
- Nudges – Prompts
  - Similarity: informative, relevant, helpful and task setting
  - Contradiction: considered as complementary knowledge

U-SEM Evaluation: Learning Style Analysis on Twitter

Evaluation question addressed

- Does the augmented user modelling validly/correctly reflect the real world (i.e. are inferences made to user characteristics correct)?

Method

- Assess learning style of participants via Index of Learning Style
- Four types of learning styles based on the Felder-Silverman Learning Style Model (Felder & Silverman, 1988)
  - Sensing/intuitive
  - Visual/verbal
  - Active/reflective
  - Sequential/global

(ILS: Felder & Spurlin, 2005)

- Participants provide Twitter username; 136 filled in ILS 51 participants with enough tweets

U-SEM Evaluation: Learning Style Analysis on Twitter

Results

- Only for active/reflective classification approach was better than by chance

Lessons learnt

- Hard to get participants
- Interesting approach and might be useful for user model augmentation
- Different features might be used

Outlook

- Applying Methodology in different context → Cultural awareness study

Overall Conclusion in regard to SRL

Simulators are strong on learning phase of SRL

ImREAL tries to support:

- Forethought phase through I-CAW
- Forethought and Reflection phase through (A)MSS
- All three phases through U-SEM

Contact:

ImREAL

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Learning

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Thank you!

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