LinkedUp kickoff / Session 4: Evaluation Framework Criteria and Indicator

Hendrik Drachsler & Slavi Stoyanov
Agenda

- 05-minute Introduction (Hendrik)
- 20-minute Presentations on experiences, best practices (Philippe Cudré-Mauroux) (Nikolaus Forgo)
- 10-minute Plenary Discussion on lessons learned for LinkedUp (All)
- 15-minute Presentation on Group Concept Mapping (Hendrik)
- 15-minute Presentation of the initial version of the evaluation framework + examples for educational and usability evaluation criteria and suitable methods (Hendrik)
- 25-minute Plenary discussion on suitable evaluation criteria, methods, and experts that should be involved in the development of the evaluation framework
Objectives of the session

1. Legal/privacy aspects of open data sharing
2. Awareness about the evaluation task
3. Knowing the GCM method
4. Collection of suitable evaluation indicators

Nikolaus Forgo
An example: Evaluation of TEL RecSys

The idea is to pick from my previous list 20-50 movies that share similar audience with "Taken", then how much I will like depend on how much I liked those early movies – In short: I tend to watch this movie because I have watched those movies… or – People who have watched those movies also liked this movie (Amazon style) probabilistic combination of – Item-based method – User-based method – Matrix Factorization – (May be) content-based method
RecSysTEL Eval. criteria

1. Accuracy
2. Coverage
3. Precision
4. Recall

1. Effectiveness of learning
2. Efficiency of learning
3. Drop out rate
4. Satisfaction

Combine approach by Drachslers et al. 2008

1. Reaction of learner
2. Learning improved
3. Behaviour
4. Results

Kirkpatrick model by Manouselis et al. 2010
Conclusions:

Half of the systems (11/20) still at design or prototyping stage only 9 systems evaluated through trials with human users.
The TEL recommender research is a bit like this...

We need to design for each domain an appropriate recommender system that fits the goals, tasks, and particular constraints.
But...

TEL recommender experiments lack transparency and standardization. They need to be repeatable to test:

• Validity
• Verification
• Compare results
1st Workshop on Recommender Systems for Technology Enhanced Learning (RecSysTEL 2010)

Issues and Considerations regarding Sharable Data Sets for Recommender Systems in Technology Enhanced Learning

Hendrik Drachsler*, Toine Bogers, Riina Vuorikari, Katrien Verbert, Erik Duval, Nikos Manouselis, Günter Beham, Stephanie Lindstaedt, Hermann Stern, Martin Friedrich, Martin Wolpers

RecSysTEL 2010
Workshop on Recommender Systems for Technology Enhanced Learning

Organised jointly by
4th ACM Conference on Recommender Systems (RecSys 2010)
5th European Conference on Technology Enhanced Learning (EC-TEL 2010)

Barcelona, Spain, 29-30 September 2010
### TEL RecSys::Evaluation/datasets

<table>
<thead>
<tr>
<th></th>
<th>Mendeley</th>
<th>APOSdle</th>
<th>ReMashed</th>
<th>Organic .edunet</th>
<th>Mace</th>
<th>Melt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection period</td>
<td>1 year</td>
<td>3 months</td>
<td>2 years</td>
<td>9 months</td>
<td>3 years</td>
<td>6 months</td>
</tr>
<tr>
<td>Users</td>
<td>200,000</td>
<td>6</td>
<td>140</td>
<td>1,000</td>
<td>1,148</td>
<td>98</td>
</tr>
<tr>
<td>Items</td>
<td>1,857,912</td>
<td>163</td>
<td>96,000</td>
<td>11,000</td>
<td>12,000</td>
<td>1,923</td>
</tr>
<tr>
<td>Activities</td>
<td>4,848,725</td>
<td>1,500</td>
<td>23,264</td>
<td>920</td>
<td>461,982</td>
<td>16,353</td>
</tr>
<tr>
<td>reads</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>tags</td>
<td>+</td>
<td>(+)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>ratings</td>
<td>(+)</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>downloads</td>
<td>(+)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Dataset-driven Research for Improving Recommender Systems for Learning

Katrien Verbert1, Hendrik Drachsler2, Nikos Manouselis3, Martin Wolpers4, Riina Vuorikari5 and Erik Duval5

1 Department of Computer Science, K.U.Leuven
Celestijnenlaan 200A, B-3001 Leuven, Belgium
{katrien.verbert, erik.duval}@cs.kuleuven.be
2 Open University of the Netherlands (OUNL)
P.O. Box 29960, 6400 DL Heerlen, The Netherlands
hendrik.drachsler@ou.nl
3 Greek Research and Technology Network (GRNET)
36 Messogion Av., 115 27, Athens, Greece
nikos@elee.org
4 Fraunhofer Institute for Applied Information Technology (FIT)
Schloss Birlinghoven, 53754 Sankt Augustin, Germany
martin.wolpers@fit.fraunhofer.de
5 European Schoolnet (EUN)
Rue de Trèves, 61, 1040 Brussels, Belgium
riina.vuorikari@sun.org

Abstract. In the world of recommender systems, it is a common practice to use public available datasets from different application environments (e.g. MovieLens, Book-Crossing, or EachMovie) in order to evaluate recommendation algorithms. These datasets are used as benchmarks to develop new recommendation algorithms and to compare them to other algorithms in given settings. In this paper, we explore datasets that capture learner interactions with tools and resources. We use the datasets to evaluate and compare the performance of different recommendation algorithms for Technology Enhanced Learning (TEL). We present an experimental comparison of the accuracy of several collaborative filtering algorithms applied to these TEL datasets and lab implicit relevance data, such as downloads and tags, that can be augmented explicit relevance evidence in order to improve the performance of recommendation algorithms.
In LinkedUp we have the opportunity to apply a structured approach to develop a community accepted evaluation framework.

1. Top-Down by a literature study
2. Bottom-up by GCM with experts in the field

<table>
<thead>
<tr>
<th>action</th>
<th>dataTEL</th>
<th>PSLC DataShop</th>
<th>Mulce</th>
</tr>
</thead>
<tbody>
<tr>
<td>add/remove</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>tag/annotate</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>rate/star</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>request help</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>save/download</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>login/logout</td>
<td></td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>learner/teacher</td>
<td>id</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>gender</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>
WP2: Literature review

1. Literature review of suitable evaluation approaches and criteria
2. Review of comprising initiatives such as LinkedEducation, MULCE, E3FPLE and the SIG dataTEL
WP2: Group Concept Mapping

- Group Concept Mapping resembles the Post-it notes problem solving technique and Delphi method.

- GCM involves participants in a few simple activities (generating, sorting and rating of ideas) that most people are used to.

GCM is different in two substantial ways:
1. Robust analysis (MDS and HCA)
   GCM takes up the original participants contribution and then quantitatively aggregate it to show their collective view (as thematic clusters).

2. Visualisation
   GCM presents the results from the analysis as conceptual maps and other graphical representations (pattern matching and go-zones).
• innovations in way network is delivered
• (investigate) corporate/structural alignment
• assist in the development of non-traditional partnerships (Rehab with the Medicine Community)
• expand investigation and knowledge of PSN/PSO's
• continue sponsored forums on public health issues (medicine managed care forum)
• inventory assets of all participating agencies (providers, Venn Diagrams)
• access additional funds for telemedicine expansion
• be a better utilization of current technological bridge
• ensure support by STACS to maintain feasibility
• expand and encourage utilization of interface programs to strengthen the health care delivery system (teleconference)
• discussion with DCHV

...organize the issues...

Centre for Learning Sciences and Technologies
Representation

Sort for one participant

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Binary, square similarity matrix

Total square similarity matrix across participants

Centre for Learning Sciences and Technology
Multidimensional Scaling

Input: A square matrix of relationships among a set of entities

Output: An n-dimensional mapping of the entities
• Innovations in way network is delivered
• Investigate corporate/structural alignment
• Assist in the development of non-traditional partnerships (Rehab with the Medicine Community)
• Expand investigation and knowledge of PSNs/PSOs
• Expand investigation and knowledge of public health issues (medicine managed care forum)
• Inventory assets of all participating agencies (providers, Venn Diagrams)
• Access additional funds for telemedicine expansion
• Better utilization of current technological bridge
• Continued support by STHCS to member facilities
• Expand and encourage utilization of interface programs to strengthens the telehealth care delivery system (teleconference)
• Discussion with COCs

...”map” the issues...

Centre for Learning Sciences and Technologies

Brainstorm

Organize

Sort

Rate
brainstorm
- innovations in way network is delivered
- investigate corporate/structural alignment
- assist in the development of non-traditional partnerships (Rehab with the Medicine Community)
- expand investigatory and knowledge of PSNs/PSO's
- maintain several investigatory forums on public health issues (Medicare managed care forum)
- inventory assets of all participating agencies (providers, Venn Diagrams)
- access additional funds for telemedicine expansion
- better utilization of current technological bridge
- continued support by STCS to member facilities
- expand and encourage utilization of existing programs to strengthen the health care delivery system (teleconference)
- discussion with CDCs

organize
- sort
- rate
- map

...prioritize the issues...
A Cluster Map

- Technology in education
- Tools and services enhancing learning
- Open education and resources
- Assessment, accreditation and qualifications
- Globalisation of education
- Roles of institutions
- Formal education goes informal
- Individual and social nature of learning
- Epistemological and ontological bases of pedagogical methods
- Individual and profession driven education
- Life-long learning
- Tools and services enhancing learning
- Open education and resources
- Technology in education

Centre for Learning Sciences and Technologies

Open Universiteit
celstec.org
A cluster rating map

Cluster Legend

Layer Value
1 3.21 to 3.38
2 3.38 to 3.55
3 3.55 to 3.72
4 3.72 to 3.89
5 3.89 to 4.06
Pattern Matching Values

<table>
<thead>
<tr>
<th>Importance</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.06</td>
<td>3.91</td>
</tr>
<tr>
<td>Individual and social nature of learning</td>
<td>Open education and resources</td>
</tr>
<tr>
<td>Individual and profession driven education</td>
<td>Tools and services enhancing learning</td>
</tr>
<tr>
<td>Formal education goes informal</td>
<td>Technology in education</td>
</tr>
<tr>
<td>Life-long learning</td>
<td>Life-long learning</td>
</tr>
<tr>
<td>Epistemological and ontological bases of pedagogical methods</td>
<td>Assessment, accreditation and qualifications</td>
</tr>
<tr>
<td>Tools and services enhancing learning</td>
<td>Individual and social nature of learning</td>
</tr>
<tr>
<td>Assessment, accreditation and qualifications</td>
<td>Role of teacher</td>
</tr>
<tr>
<td>Globalisation of education</td>
<td>Roles of institutions</td>
</tr>
<tr>
<td>Roles of institutions</td>
<td>Epistemological and ontological bases of pedagogical methods</td>
</tr>
<tr>
<td>Role of teacher</td>
<td>Globalisation of education</td>
</tr>
<tr>
<td>Open education and resources</td>
<td>Individual and profession driven education</td>
</tr>
<tr>
<td>Technology in education</td>
<td>Formal education goes informal</td>
</tr>
</tbody>
</table>

r = -.5

Centre for Learning Sciences and Technologies

Open Universiteit
celstec.org
Pattern Matching Groups

Technical Science

4

- Individual and social nature of learning
- Individual and profession driven education
- Tools and services enhancing learning
- Life-long learning
- Formal education goes informal
- Assessment, accreditation and qualifications
- Epistemological and ontological bases of pedagogical methods
- Roles of institutions
- Open education and resources
- Role of teacher
- Technology in education
- Globalisation of education

Social science

4.09

- Individual and profession driven education
- Individual and social nature of learning
- Life-long learning
- Formal education goes informal
- Epistemological and ontological bases of pedagogical methods
- Tools and services enhancing learning
- Globalisation of education
- Assessment, accreditation and qualifications
- Role of teacher
- Roles of institutions
- Open education and resources
- Technology in education

r = .81

Centre for Learning Sciences and Technologies

Open Universiteit
celstec.org
GCM in CELSTEC

- Characteristics of Adaptive Learning Content Management System
- Success and failure factors for ICT project in higher education
- The future of education
- Mobile learning
- Handover training interventions
- Framework of digital competence
- Effect of TV programmes on minority groups
- LLL Limburg
- ICT and foreign language learning
- Language technologies for LLL
- Development of learning outcomes of interdisciplinary module on Creativity and Innovation
- Part of a software and development methodology
- 5 PhD projects
Handover

• 105 statements about handover training interventions
• Sorting on similarity in meaning
• Rating on importance and feasibility
A point map
Clusters’ labels

- Standardization
- Communication
- Coordination
- Clinical Microsystem
- Training Methods
- Transfer/Impact
- Work-place learning
Use Cases – Evaluation Framework – LinkedUp Challenge

Core questions:

1. What are relevant indicators (e.g., scalability, dropout)?
2. How to measure and benchmark?
3. How to allow comparability across diversity of submissions?
4. We want to be as specific as possible!
Looking at the DoW

<table>
<thead>
<tr>
<th>Participant number</th>
<th>Participant short name</th>
<th>Person-months per participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LUH</td>
<td>6.00</td>
</tr>
<tr>
<td>2</td>
<td>OU</td>
<td>6.00</td>
</tr>
<tr>
<td>3</td>
<td>OKF</td>
<td>7.00</td>
</tr>
<tr>
<td>4</td>
<td>ELSV</td>
<td>2.00</td>
</tr>
<tr>
<td>5</td>
<td>OUNL</td>
<td>12.00</td>
</tr>
<tr>
<td>6</td>
<td>ELS</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>37.00</strong></td>
</tr>
</tbody>
</table>

Centre for Learning Sciences and Technologies

Open Universiteit

celstec.org
Looking at the DoW

<table>
<thead>
<tr>
<th>Description of work and role of partners</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Task 2.1 – Evaluation criteria and method review (OUNL, LUH, OUUK, ELSVR)</strong></td>
</tr>
<tr>
<td>This task aims at reviewing existing evaluation criteria and methods for data-driven applications with the Cognitive Work through method. The outcomes of this task will contribute to Task 2.2 the validation of the evaluation criteria by a group of experts.</td>
</tr>
<tr>
<td><strong>Task 2.2 – Validation of the evaluation criteria and methods (OUNL, OKFN)</strong></td>
</tr>
<tr>
<td>Based on the collected information from Task 2.1, WP2 will apply Group Concept Mapping to further analyse the evaluation criteria and to identify consensus about the evaluation criteria and methods. It will extract the most suitable evaluation criteria for the LinkedUp context – large-scale Web data and information management.</td>
</tr>
<tr>
<td><strong>Task 2.3 - Evaluation framework (OUNL, LUH, OUUK)</strong></td>
</tr>
<tr>
<td>The report of the Task 2.1 and the outcomes of the Group Concept Mapping in Task 2.2 will lay the foundations for the design of the evaluation framework. The evaluation framework will consist of distinct benchmarking criteria and a rating matrix and a monitoring Website that allow a review panel to rank the participating projects of the LinkedUp challenge in a transparent and objective manner. The evaluation framework will be available in a first version as deliverable D2.2 [Month 6].</td>
</tr>
</tbody>
</table>
Two Objectives

Perfect world
- Transparent
- Address diverse target groups
- Academic complete
- Accurate

LinkedUp Challenge
- Transparent
- Efficient (time saving)
- Practical (easy to use)
- Open to all kinds of submissions

Centre for Learning Sciences and Technologies
Open Universiteit
celstec.org
Rating Map feasibility

Cluster Legend
Layer Value
1 3.12 to 3.27
2 3.27 to 3.43
3 3.43 to 3.58
4 3.58 to 3.74
5 3.74 to 3.89
## Concept Mapping Process

### Concept Mapping (Sorting input)

To organize the issues

### Measurement (Rating input)

To observe expectations and results

### Pattern Matching and Go Zones

To link expectations and results, importance and capacity

<table>
<thead>
<tr>
<th>Name</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP2 - Linkedup</td>
<td>11/05/2012</td>
<td>05/31/2013</td>
</tr>
<tr>
<td>Collect indicators and experts in Gdoc</td>
<td>11/05/2012</td>
<td>12/1/2012</td>
</tr>
<tr>
<td>GCM web environment</td>
<td>11/20/2012</td>
<td>11/27/2012</td>
</tr>
<tr>
<td>Literature review</td>
<td>11/12/2012</td>
<td>12/12/2012</td>
</tr>
<tr>
<td>Overview indicators (literature + experts)</td>
<td>12/12/2012</td>
<td>12/12/2012</td>
</tr>
<tr>
<td>FP7 Proposals / Holidays</td>
<td>12/17/2012</td>
<td>01/5/2013</td>
</tr>
<tr>
<td>GCM instructions</td>
<td>01/16/2013</td>
<td>01/25/2013</td>
</tr>
<tr>
<td>GCM process</td>
<td>02/1/2013</td>
<td>03/1/2013</td>
</tr>
<tr>
<td>GCM report</td>
<td>03/01/2013</td>
<td>03/01/2013</td>
</tr>
<tr>
<td>GCM report review</td>
<td>03/04/2013</td>
<td>03/18/2013</td>
</tr>
<tr>
<td>Eval. Framework meeting</td>
<td>03/18/2013</td>
<td>03/18/2013</td>
</tr>
<tr>
<td>Preparing Eval. Framework</td>
<td>03/18/2013</td>
<td>04/30/2013</td>
</tr>
<tr>
<td>Draft of Eval. Framework</td>
<td>05/01/2013</td>
<td>05/01/2013</td>
</tr>
<tr>
<td>Internal Review</td>
<td>05/01/2013</td>
<td>05/15/2013</td>
</tr>
<tr>
<td>Final Version Eval. Framework</td>
<td>05/16/2013</td>
<td>05/31/2013</td>
</tr>
</tbody>
</table>

*Note: The table and diagram are used to illustrate the process of concept mapping, measurement, and pattern matching.*

---

Centre for Learning Sciences and Technologies

Open Universiteit

[celstec.org](http://celstec.org)
Evaluation Framework

**Domain Aspects (DEA)**
- **DEA.1** Effectiveness of learning (e.g., higher skill level, or grades)
- **DEA.2** Efficiency of learning (e.g., less study time for equal outcomes)
- **DEA.3** Attractiveness of learning (e.g., increases motivation or offers new insights by combining data sources)

**Technical Aspects (TA)**
- **TA.1** Data coverage (e.g., amount of used data sources, size of dataset, data quality)
- **TA.2** Scalability (e.g., possibility to scale up to large datasets and add new data sources)
- **TA.3** Performance (e.g., response time, amount of bugs)
- **TA.4** Accuracy (e.g., information retrieval measures like Precision, Recall, F1)

**Usability Aspects (UA)**
- **UA.1** Understandability (e.g., difficulty of logical, or navigation concept)
- **UA.2** Learnability (e.g., effort to get used to a new software)
- **UA.3** Collaboration patterns (e.g., connection to social networks and other user information)

**Deployment Aspects (DA)**
- **DA.1** User scenario (e.g., matching to LinkedUp vision and project target group)
- **DA.2** Reach (e.g., number of target domains and users)
- **DA.3** Privacy (e.g., privacy regulations or user agreements)
- **DA.4** Multi-linguality (e.g., number of supported languages, access to data in other languages)
Brainstorming Statements

Brainstorming Statements - In the text box below, type a statement that completes or answers the focus prompt. You may add as many statements as you wish. Please keep each statement brief, just one thought. Select "add this statement" after each statement or idea. Your statement will then be saved and added to the list of collected statements at the bottom of the page. Please review the other statements to see if your idea is already there. You may search this list of collected statements using the search function below.

**FOCUS PROMPT:** One specific characteristic of effective handover training is...

Look for a standard approach to handover communication.

Adopt methods already used in other domains (Crew Resource Management, I-SBAR, Five Ps, I-PASS-THE-BATTON).

Shift attention from one doctor-one patient relationships to cross-cover patient commitments and transfer of professional responsibility.

Adopt methods of high-performance teams.

Create appropriate attitudes, climates and role models.
Concept System instruction for sorting

INSTRUCTIONS: In this activity, you will categorize the statements, according to your view of their meaning or theme. To do this, you will sort each statement into a category in a way that makes sense to you.

First, read through the statements in the Unsorted Statements column on the left.

Next, sort each statement into a category you create. Click on the items to drag them onto the empty area in the middle of the screen. Group the statements for how similar in meaning or theme they are to one another. Give each category a name that describes its theme or contents.

There is no right or wrong way to group the statements. You will probably find that you could group the statements in several sensible ways. Pick the arrangement that feels best to you.

The task may seem overwhelming at first glance, but while you are reading the statements you will get an idea about some of the possible categories. You can always create new categories, delete
Concept System Sorting

PROJECT FOCUS PROMPT:
One specific characteristic of effective handover training is...

3 out of 105 sorted.
Unsorted statements:
Couple inexperienced handover providers with experienced incoming and outgoing providers.

Apply evidence-based handover guidelines.

More effective are the handover guidelines that are integrated into the process of decision making.

Handover protocols should account for the variability in either institutional or national cultures.

Handover content
- Look for a standard approach to handover communication.
- Apply a standardised handover protocol.

Instructional methods
- Adopt methods already used in other domains (Crew Resource Management, I-SBAR, Five Ps, I-PASS-THE-BATTON).
- Adopt methods of high-performance teams.
- Teach handover providers to tell a better story.
- Create appropriate attitudes, climate and role models.

Handover attitudes
- Shift attention from one doctor-one patient relationships to cross-cover patient commitments and transfer of professional responsibility.

Training impact
- The impact of formal training on improving environmental characteristics is relatively limited when compared to the effect of the support integrated in work environment and the redesign of clinical systems.
## Concept System Rating

#### Importance Rating

Please rate the following statements, in the range indicated below. Rate each statement on a 1-to-5 scale where: 1 = relatively unimportant; 2 = somewhat important; 3 = moderately important; 4 = very important; 5 = extremely important. Try to use the full range of ratings values (e.g. 1 to 5). In absolute sense, maybe every statement is important but your task here is to judge the relative importance of the statements when compared to each other.

**Project Focus Prompt:** One specific characteristic of effective handover training is...

<table>
<thead>
<tr>
<th>Rating</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (unrate)</td>
<td>Look for a standard approach to handover communication.</td>
</tr>
<tr>
<td>1 (unrate)</td>
<td>Shift attention from one doctor-one patient relationships to cross-cover patient commitments and transfer of professional responsibility.</td>
</tr>
<tr>
<td>1 (unrate)</td>
<td>Adopt methods of high-performance teams.</td>
</tr>
<tr>
<td>1 (unrate)</td>
<td>Create appropriate attitudes, climate and role models.</td>
</tr>
<tr>
<td>1 (unrate)</td>
<td>Teach handover providers to tell a 'better story'.</td>
</tr>
</tbody>
</table>
Online Consultation IPTS

• delphi study – 79 experts
• common understanding / mapping of digital competence
• online brainstorm
• “A digitally competent person…”
Procedure data analysis

- identify unique statements (134)
- Sort statements (Websort.net)
- Plan b: workshop 17 experts
1. Is able to make informed decisions (with human or technological assistance where appropriate) about whether and how to use technologies to pursue goals that have personal meaning and relevance to his/her life.

2. Has reasonable knowledge of available technologies, their strengths and weaknesses and whether and how they might support the achievement of personal goals.

3. Has a general level of confidence, meaning that...
2. Has reasonable knowledge of available technologies, their strengths and weaknesses and whether and how they might support the achievement of personal goals.

3. Has a general level of confidence, meaning that s/he is willing to experiment with new technologies, but also to reject inappropriate technologies.

4. Has sufficient social and cultural capital so that technology use is supported and encouraged in the communities to which s/he belongs.

5. Can use different ICT in a way that helps to achieve certain results quicker, better, easier.

6. Understands the role of ICT in everyday life, in social life and at work.
<table>
<thead>
<tr>
<th>Category</th>
<th>Participants</th>
<th>Total items</th>
<th>Unique items</th>
<th>Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicator and collaboration</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>Computer programmer</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Critical thinking skills</td>
<td>1</td>
<td>18</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>Digital creator / re-make</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>e-Safety</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Enthusiasm for self-development</td>
<td>1</td>
<td>18</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>Etiquette and ethics</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>ICT skills</td>
<td>1</td>
<td>47</td>
<td>47</td>
<td>1</td>
</tr>
<tr>
<td>Social awareness</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Category</td>
<td>Participants</td>
<td>Total items</td>
<td>Unique items</td>
<td>Agreement</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------</td>
<td>-------------</td>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Altruism</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Awareness</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Basic functional skills</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Behave appropriately</td>
<td>1</td>
<td>9</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Collaborate/Co-operate</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Confident and tech-sav</td>
<td>1</td>
<td>25</td>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>Efficient and Effective</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Everyday living</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Exercise judgement</td>
<td>1</td>
<td>9</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Find, engage, use, re-u</td>
<td>1</td>
<td>13</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Identity/self actualisa</td>
<td>1</td>
<td>13</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Learn</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Power user</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Safe and secure</td>
<td>1</td>
<td>13</td>
<td>13</td>
<td>1</td>
</tr>
<tr>
<td>Work and professional</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>
Groupings based on an Average Linkage Cluster Analysis algorithm.

Number of groups: 16

10. Considers legal and ethical ...
12. Understands the rights of o...
18. Understands and abides b...
50. Never uses digital applicat...
111. Has an advanced sense o...
129. Understands the ethics a...

54. Is able to assess and reduc...
119. Is aware of the impact an...
83. Is able to find out who th...
72. Understands how major pr...
112. Knows that most major in...
45. Has an understanding of se...
64. Understands the risks asso...
70. Is aware of privacy issues ...
41. Is able to protect him/hers ...
65. Understands the risk of ide...

4. Has sufficient social and cul...
133. Can participate fully in so...
27. Is willing to contribute to th...
73. Is able to manage his/her ...
51. Is able to create, share/pre...
52. Is able to communicate and ...
79. Does not need high technic...
Next day

• feedback initial solution

• 15 clusters

• 4 groups: add label / describe / rearrange
• analyse results

• 14 Cluster – 125 statements

• second consultation round:
  • total group
  • comment / rate

• analyse feedback
Digital Competence Building Blocks

Seamless use demonstrating self-efficacy
Informed decisions on appropriate technologies
Learning about and with digital technologies

Legal & ethical aspects
Privacy & Security
Technology mediated communication & collaboration

Specialized & advanced competence for work & creative expression
Use in everyday life
General knowledge & functional skills

Balanced attitude towards technology
Understanding role ICT in society
Information processing & management
Evaluation / USP

- Flexibility
- Rich data
- Intuitive yet robust method
- Collective view (≠ consensus)
Usability evaluation

Poster Presentation - UPA 2012 Conference

Desirability testing at World's End
An introduction to a remote version of the Product Reaction Cards

Jeroen Storm

Centre for Learning Sciences and Technologies
Open Universiteit celstec.org
Your turn …

Questions – Suggestions – Open Discussion

please add anything that comes to your mind in the open Gdoc

Thank you for attending this lecture!

This slide is available at:
http://www.slideshare.com/Drachsler

Email: hendrik.drachsler@ou.nl

Skype: celstec-hendrik.drachsler

Blogging at: http://www.drachsler.de

Twittering at: http://twitter.com/HDrachsler