OPeL: Online Prompting in eLearning. A new tool to foster skills and knowledge

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Introduction

The objective of this work is to introduce a new tool for prompting sequences in a Technology Enhances Learning Environments (TELE) and to present results of the first implementations. We developed the Online Prompting eLearning (OPeL) for Moodle 1.9 and used it twice in two different courses at two applied universities. There are two research questions for this paper: How is OPeL accepted by the learners? Permits OPeL to transfer knowledge and skills, i.e. does OPeL enhance the performance of the learners?

OPeL includes the self-estimation of one's performance answering questions concerning (a part of) the content of a course. It permits to build sequences of questions and answers. The standard sequence is: problem/situation, question, students-solution, sample solutions, comparison of the solutions, comments. It's possible to combine several sequences. We used it to prompt the content of a communication course and episodes of behaviour changes.

In education prompts are learning aids to increase recall and performance. Prompts range from general questions to explicit instructions. Prompts don't teach new things, students already have the knowledge and skills, they help to remember, they direct the attention of the students on specific aspects of the learning process (Bannert, 2009). There is direct and indirect prompting. Direct prompting demands time and resources, they train strategies, which gain use and specific gain are learned in training sessions (Friedrich & Mandl, 1997, 1992). Indirect prompting initiates and enhances specific learning and regulation activities even without the conscious awareness of the learner. They consist of learning aids integrated in the learning environment (Friedrich & Mandl, 1997, 1992). Generally, in e-learning courses indirect prompting is used. To our knowledge there is no generally accepted classification of prompts.

Bannert (2009) distinguishes thee types of prompts: 1) cognitive prompts (explanations prompts; support directly information processing of the learner), 2), meta-cognitive prompts (regulations prompts; support supervising and controlling of information processing) and 3) motivational prompts (support the motivation of the learner). Another type is resource management prompting that optimizes the learning conditions.

Explanations prompts invite learners to explain topics to oneself, and to reason about learning strategies used (Bannert, 2006, 2007, 2009).

The discussion of learning transfer is older than a century (Barnett & Ceci, 2002). The topic of transfer was first described by the psychologists Thorndike and Woodworth (1901). However, the consensus on what is meant by transfer and to what extent it may by observed as well as what mechanisms drive it, is decidedly minimal (Barnett & Ceci, 2002). Traditionally, transfer means:

"the successful application of knowledge gained or acquired skills within the context of a demand which has never previously occurred in a situation of the acquisition of knowledge or skills" (Hasselhorn & Mähler, 2000, p. 86).

There is a growing tendency towards considering transfer to be a broadly based, productive and supportive implementation of acquired knowledge, skills and

motivation, which corresponds to the present-day understanding of learning in the sense of an active and constructive process (De Corte, 2003). Therefore, there exist widely differing interpretations of the notion transfer (Hasselhorn & Mähler, 2000). The transfer we expect to occur in a learning situation is **proactive** and **positive**. The dimension of the low- vs. high-road transfer depends on the conscious investment a person makes to learn and to apply new knowledge and skills and is therefore is connected with motivation and volition. We expect a **high-road** transfer. The dimension 'proximal – distal' transfer depends on the situations were and when the transfer will be measured. We measured **proximal and distal** transfer.

Methods

We implemented OPeL 2012 and 2013 in an online course of the Swiss Distance University of Applied Sciences (FFHS) to prompt interventions in behaviour changes. Participants came from four classes. The sample consisted of 31 German speaking adult students (94% females; age: 30-50 years). We used the grades of the course exam to measure performance. The second year we integrated a short evaluation questionnaire and measured the cognitive load of the prompting questions.
2011 and 2012, we used OPeL in the Valais University of Teacher Education (HEP VS) to prompt the transfer of communication knowledge into classroom. The students belonged to eight classes from the French and German speaking part of the Canton Valais. Totally, 148 students finished the course. They were about 20 to 30 years old, most of them were female (85%). We used the grades of the course exam to measure performance, and a questionnaire for the evaluation of OPeL. A subsample (n=42) was filmed while teaching in a class during a stage. The films were analysed with a video analysing tool (Noldus, 2010).

Results

Students of the FFHS that worked through OPeL reached grades about 10% higher than the rest. They accepted the prompting tool very good, and rated it with an average of 8 (out of 10) points.
Students of the HEP VS did not show higher grades on prompted topics. In a first analysis we observed better communication skills in the classroom. In an analysis at the end of the project we could not replicate that result. We suppose that a consequence of the amount of prompts in the course. OPeL was rated significantly better than a multiple-choice condition.

Conclusions

OPeL is a very flexible tool to prompt knowledge and skills in online courses at Universities (and schools with younger students). It can be easy integrated in a Moodle course. The preparation of the sequences is easy, but it surly needs a good knowledge of the teaching subject.
OPeL is very good accepted by students. But, it's crucial to integrate it adapted to the content, learning material, and the students. Further, it's important to motivate students to work with the prompting tool OPeL showing the usefulness and successfulness.
First analyses of OPeL on the influence on the learning performance show some promising results. OPeL helps to transfer knowledge from the online course to case examples.
Our next steps are to adapt OPeL to Moodle 2.7 and to further evaluate its use in online courses with different contents, and with different learning materials.

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Zürich | Basel | Bern | Brig
Mitglied der SUPSI

OPeL: Online Prompting in eLearning

A new tool to foster skills and knowledge

ECER 2014 | Porto | 2-4 September 2014

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Objective

Introducing a new tool for **prompting sequences** in a Technology Enhances Learning Environments (**TELE**) and presenting results of the first implementations

Research questions

1. How is OPeL accepted by the learners?
2. Permits OPeL to transfer knowledge and skills, i.e. does OPeL enhance the performance of the learners?

Introduction

Prompts in education

- learning aids to increase recall and performance.
- range from general questions to explicit instructions
- don't teach new things
- help to remember (direction of attention on specific aspects of the learning process)

Direct prompting

- demands time and resources
- train strategies (which gain use and specific gains are learned in training sessions)

Indirect prompting (generally in eLearning)

- initiates and enhances specific learning and regulation activities
  (even without the conscious awareness of the learner)
- consist of learning aids integrated in the learning environment

Introduction

Three types of prompts (Bannert (2009):

1. **cognitive prompts** (explanation prompts)
2. **meta-cognitive prompts** (regulation prompts)
3. **motivational prompts**

Explanations prompts

invite learners to explain topics to oneself, and to reason about learning strategies used

Introduction

OPeL – **O**nline **P**rompting in **eL**earning

The standard sequence

1. problem / situation / case
2. question
3. student's solution
4. teacher proposed solution
5. comparison of the solutions
6. comments

It is possible to combine several sequences.

OPeL includes the self-estimation of one's performance by answering questions concerning (a part of) the content of a course.

Introduction

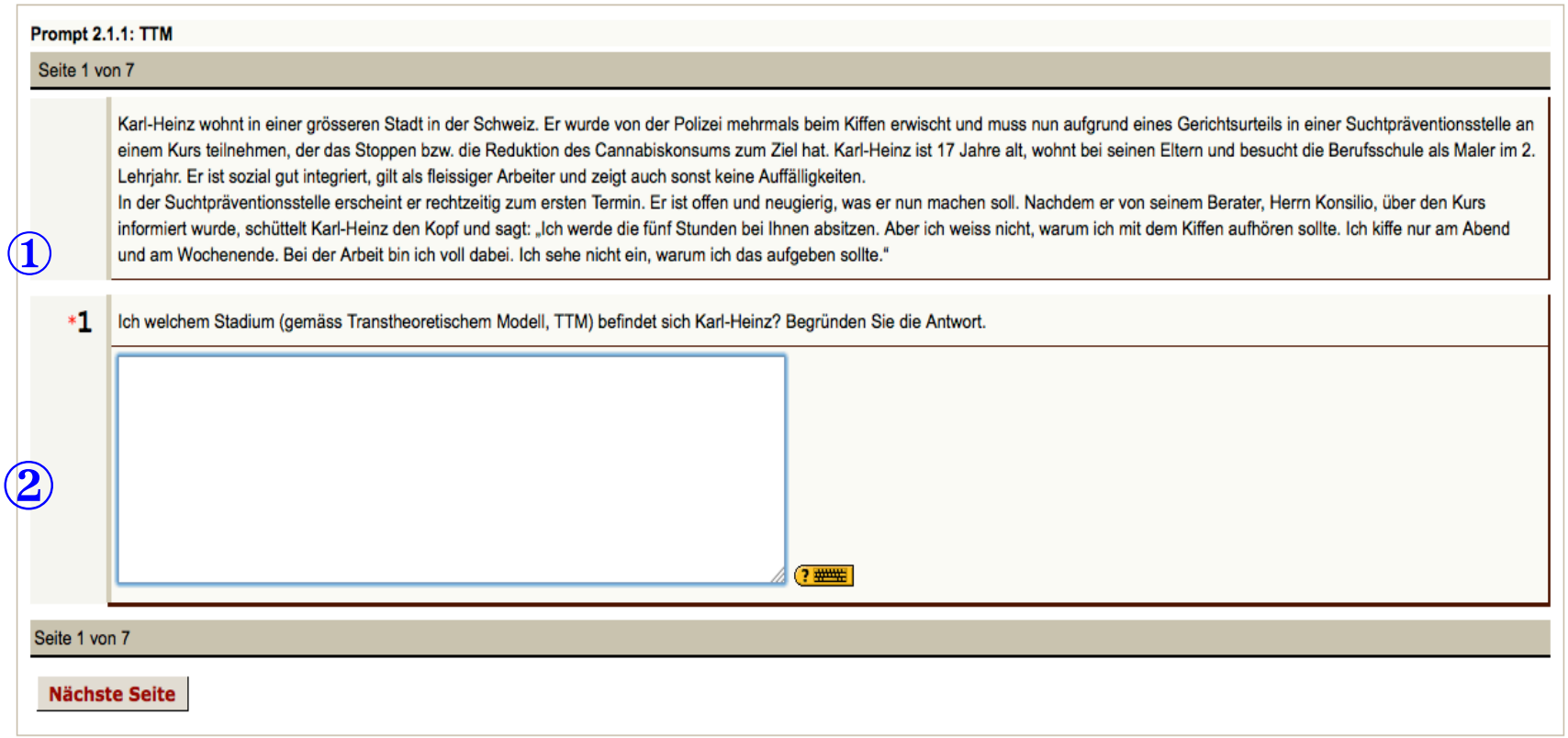
Learning Transfer

- Traditionally, transfer means:
  "the successful application of knowledge gained or acquired skills within the context of a demand which has never previously occurred in a situation of the acquisition of knowledge or skills" (Hasselhorn & Mähler, 2000, p. 86)
- There is a growing tendency towards considering transfer to be a broadly based, productive and supportive implementation of acquired knowledge, skills and motivation, which corresponds to the present-day understanding of **learning in the sense of an active and constructive process** (De Corte, 2003).

The transfer we expect to occur in a learning situation is

- **proactive** and **positive**
- **high-road** transfer (conscious investment; therefore connected with motivation and volition)
- **proximal and distal**

Methods


Prompt 2.1.1: TTM
Seite 1 von 7
Karl-Heinz wohnt in einer grösseren Stadt in der Schweiz. Er wurde von der Polizei mehrmals beim Kiffen erwischt und muss nun aufgrund eines Gerichtsurteils in einer Suchtpräventionsstelle an einem Kurs teilnehmen, der das Stoppen bzw. die Reduktion des Cannabiskonsums zum Ziel hat. Karl-Heinz ist 17 Jahre alt, wohnt bei seinen Eltern und besucht die Berufsschule als Maler im 2. Lehrjahr. Er ist sozial gut integriert, gilt als fleissiger Arbeiter und zeigt auch sonst keine Auffälligkeiten.
In der Suchtpräventionsstelle erscheint er rechtzeitig zum ersten Termin. Er ist offen und neugierig, was er nun machen soll. Nachdem er von seinem Berater, Herrn Konsilio, über den Kurs informiert wurde, schüttelt Karl-Heinz den Kopf und sagt: „Ich werde die fünf Stunden bei Ihnen absitzen. Aber ich weiss nicht, warum ich mit dem Kiffen aufhören sollte. Ich kiffe nur am Abend und am Wochenende. Bei der Arbeit bin ich voll dabei. Ich sehe nicht ein, warum ich das aufgeben sollte."
①
*1
Ich welchem Stadium (gemäss Transtheoretischem Modell, TTM) befindet sich Karl-Heinz? Begründen Sie die Antwort.
②
Seite 1 von 7
Nächste Seite

Methods

cognitive load

*2 Wie hoch schätzen Sie die Schwierigkeit der eben beantworteten Frage ein?

	1	2	3	4	5	6	7	8	9	
äusserst leicht	○	○	○	○	○	○	○	○	○	äusserst schwierig

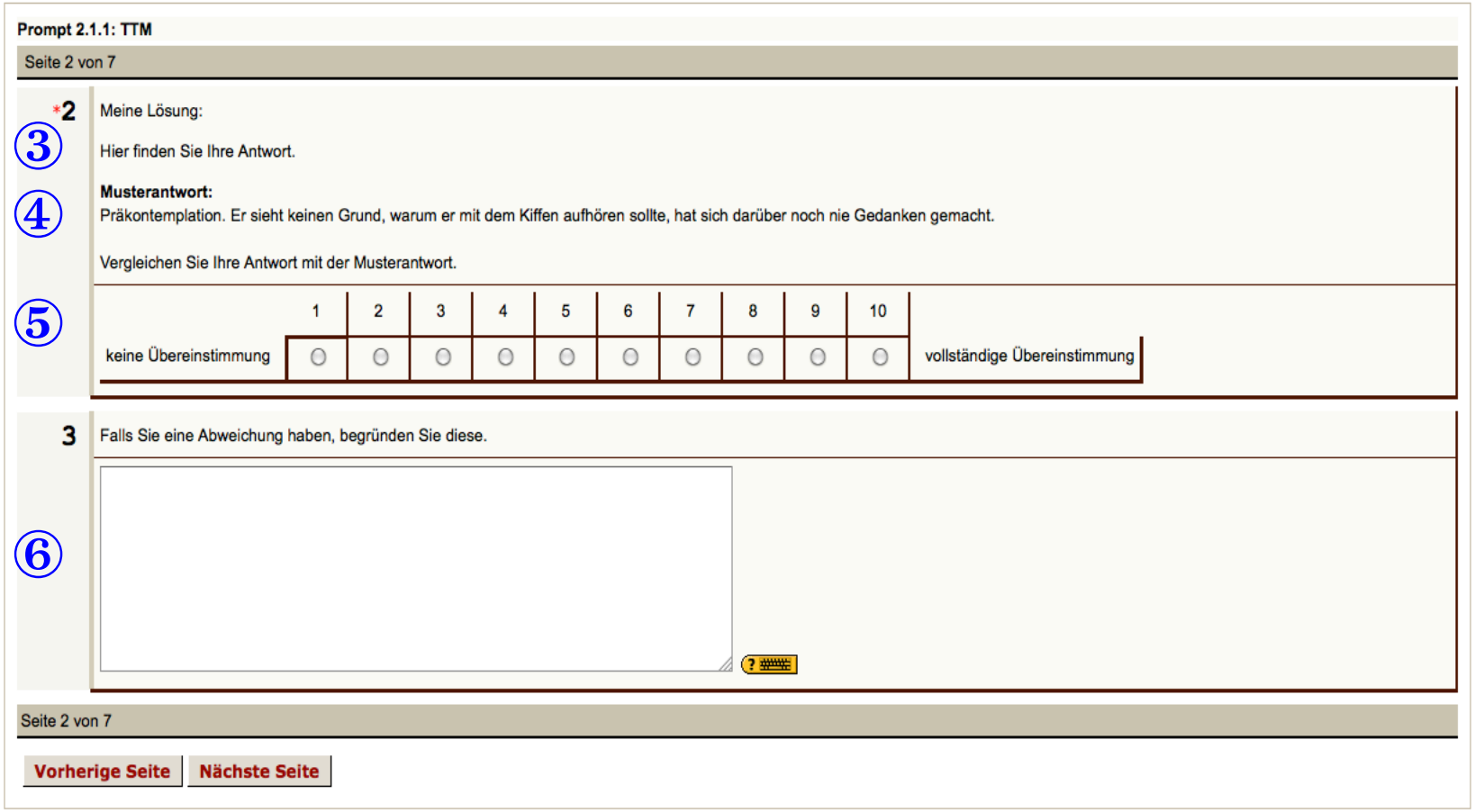
*3 Wie sehr hat Ihnen die Lernumgebung dabei geholfen, die Frage zu beantworten?

	1	2	3	4	5	6	7	8	9	
überhaupt nicht geholfen	○	○	○	○	○	○	○	○	○	sehr geholfen

*4 Wie hoch schätzen Sie Ihre mentale (geistige) Anstrengung zur Lösung der eben beantworteten Frage ein?

	1	2	3	4	5	6	7	8	9	
sehr tiefe Anstrengung	○	○	○	○	○	○	○	○	○	sehr hohe Anstrengung

Methods



Prompt 2.1.1: TTM

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*2 Meine Lösung:

③ Hier finden Sie Ihre Antwort.

④ **Musterantwort:**
Präkontemplation. Er sieht keinen Grund, warum er mit dem Kiffen aufhören sollte, hat sich darüber noch nie Gedanken gemacht.

Vergleichen Sie Ihre Antwort mit der Musterantwort.

⑤

	1	2	3	4	5	6	7	8	9	10	
keine Übereinstimmung	○	○	○	○	○	○	○	○	○	○	vollständige Übereinstimmung

3 Falls Sie eine Abweichung haben, begründen Sie diese.

⑥

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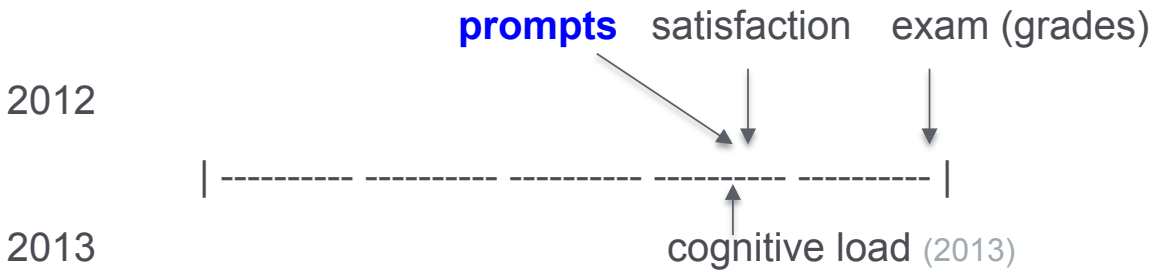
Vorherige Seite | Nächste Seite

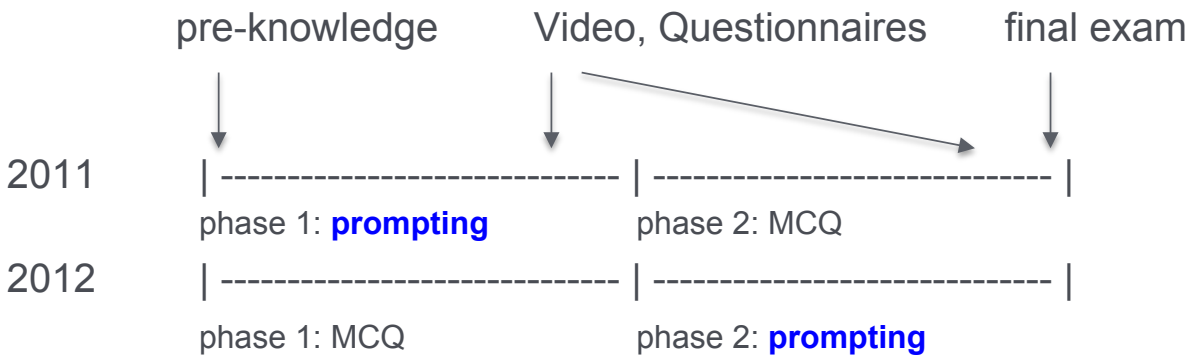
Methods

Designs

Online course of the **Swiss Distance University of Applied Sciences** (FFHS)



Course at the **Valais University of Teacher Education** (HEP VS)



Methods

Samples

Online course of the **Swiss Distance University of Applied Sciences** (FFHS)

- 4 classes (2012 / 2013) of CAS Health Psychology (behaviour change)
- 31 German speaking adult students
- 94% females
- age: 30-50 years

Course at the **Valais University of Teacher Education** (HEP VS)

- 8 classes (2011 / 2012) of a communication course
- 148 French and German speaking education students (Canton Valais)
- 85% females
- age: 20-30 years

Results

Online course of the **Swiss Distance University of Applied Sciences** (FFHS)

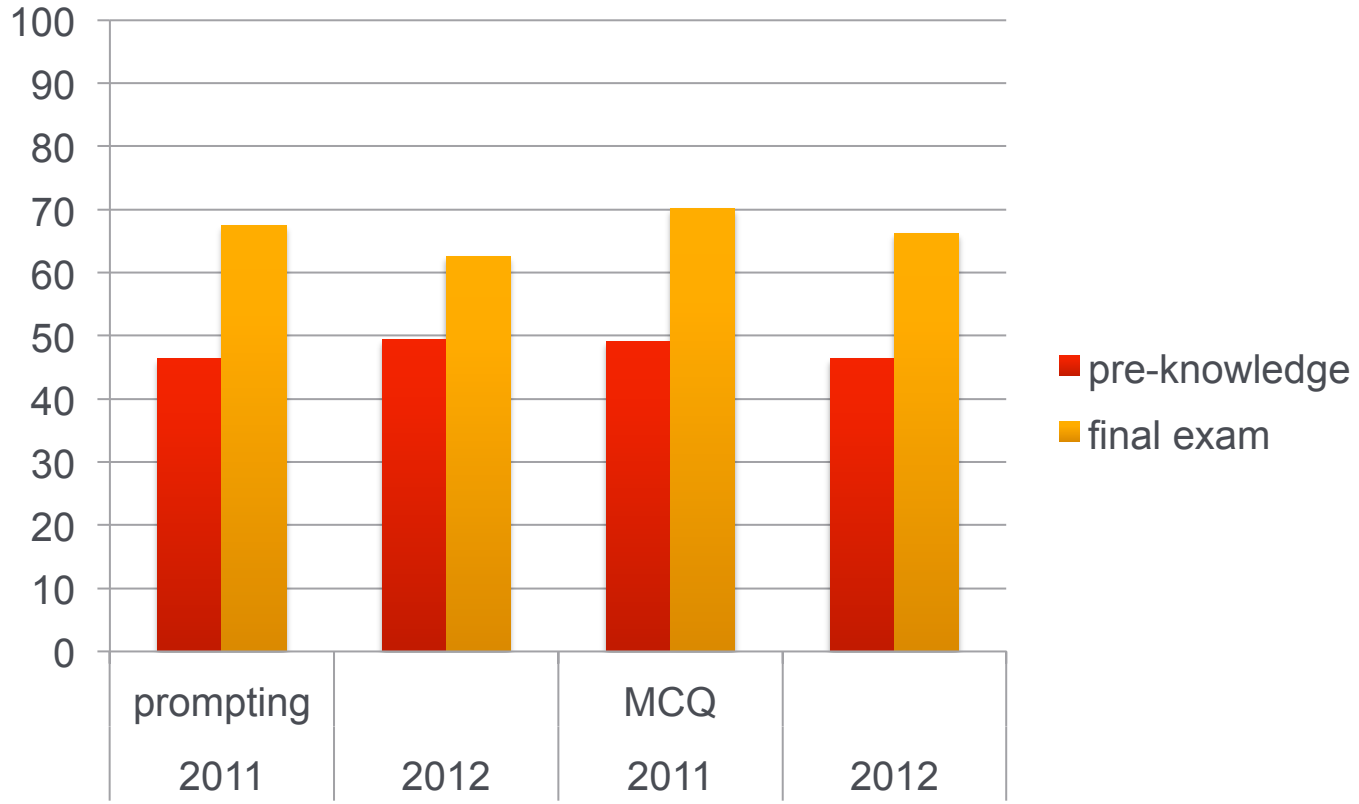
- Students of the FFHS that worked through OPeL reached **grades about 10% higher** than the others.

- They **accepted** the **prompting** tool very good, and rated it **with** an average of **8 (out of 10) points**.
  And: Students recommended the prompting exercises to others as a good preparation for the course exam.

Results

Course at the **Valais University of Teacher Education** (HEP VS)

knowledge



Results

Course at the **Valais University of Teacher Education** (HEP VS)

knowledge

	mean (sd)		
2011	|--------- prompting ---------|	|---------- MCQ ----------|	
issues 1 (prompting):	46 (12.0)	67 (9.2)	N=72
issues 2 (MCQ):	49 (12.1)	70 (8.4)	N=72
2012	|---------- MCQ ----------|	|--------- prompting ---------|	
issues 2 (prompting):	49 (12.4)	63 (9.3)	N=50
issues 1 (MCQ):	46 (10.6)	66 (9.8)	N=50

Effects	**prompting**	**MCQ**
Time	F= 210.94, p=.000	F=215.41, p=.000
Time x Year	F= 10.08, p=.002	F= 0.20, p=.654
	pre-knowledge	**Final exam**
Condition	F= 0.06, p=.801	F= 13.59, p=.000
Condition x Year	F= 4.01, p=.047	F= 0.28, p=.601

Difference condition F= 2.75, p=.100
Difference condition x Year F= 3.93, p=.050 (in favor of MCQ !)

Results

Course at the **Valais University of Teacher Education** (HEP VS)

behavior (video analyses)

mean (sd)

N=12 2011	|--------- prompting ---------|	|---------- MCQ ----------|
<3 seconds after questions:	45% (21%)	32% (17%)
echo after student response:	43% (33%)	32% (20%)

N=12 2012	|---------- MCQ ----------|	|--------- prompting ---------|
<3 seconds after questions:	40% (26%)	46% (38%)
echo after student response:	36% (29%)	40% (27%)

No significant effects.

Results

Course at the **Valais University of Teacher Education** (HEP VS)

behavior (video analyses)

mean (sd)

N=12 2011	prompting	MCQ
communication barriers:	13.1 (7.3)	14.8 (7.6)
relation open/closed questions:	2.0 (2.0)	2.1 (1.1)

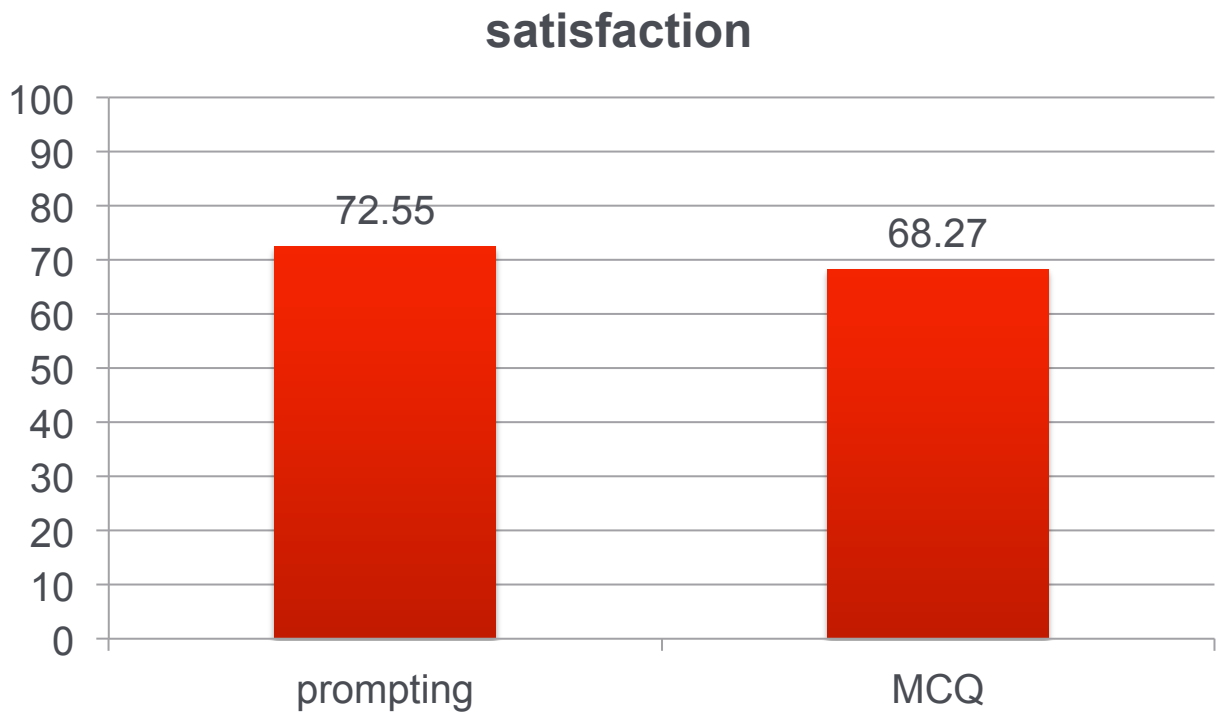
N=12 2012	MCQ	prompting
communication barriers:	9.7 (8.6)	13.7 (8.7)
relation open/closed questions:	1.4 (1.1)	2.4 (2.3)

No significant effects.

Results

Course at the **Valais University of Teacher Education** (HEP VS)

Satisfaction with course (2011)



t-test
t= 2.83; p=.006

N=72

Results

Students of the HEP VS did not show higher grades on prompted topics.

In a preliminary analysis we could observe in the filmed subsample better communication skills in the classroom. At study end we could not replicate this.

OPeL was rated significantly better in satisfaction with the course (2011).
The effect in the communication course is somewhat lower than in the blended learning course (most probably because of the importance of OPeL in the communication course, e.g. amount of prompts).

Conclusion

- OPeL is a very **flexible tool to prompt knowledge and skills** in online courses at Universities (and schools with younger students).
  It can be easy integrated in a Moodle course. The preparation of the sequences is easy, but it surly needs a good knowledge of the teaching subject.
- Generally, OPeL is **very good accepted** by students.
  But, it's crucial to integrate it adapted to the content, learning material, and the students.
  Further, **it's important to motivate students** to work with the prompting tool OPeL showing the usefulness and successfulness.
- First analyses of OPeL on the **influence on the learning performance** showed some results in different samples and different topics and learning material.
  But: newer analyses gave **no confirmation**.
  OPeL (should) help to transfer knowledge from the online course to case examples, and from the learning situation (teacher education) to the teaching situation (teaching a class).
- Our next steps are to adapt OPeL to Moodle 2.7 and to further evaluate its use in online courses with different contents, and with different learning materials.
  Further analyses: to control for moderators (e.g. type of class)

Problems in these studies

- **teaching education**
  - too many prompts
  - too many issues prompted
  - partly unfavourable design
  - too few participants filmed (but video analysis is very time consuming)

- **online course**
  - too few participants
  - difficult to motivate students (for eLearning activities in general)

Thank you for your attention!

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