NEWSLETTER

Comet VOL.5

UNIVERSITÄT SIEGEN

SIGN IN

For the online
COMET Networkmeeting

05th October 2023
University of Siegen

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LETTER OF THE EDITOR

Dear Readers,

While you are enjoying the summer, we would also like to offer you a little intellectual refreshment. In the short Newsletter COMET we take a look at the important role of competence measurement in the COMET project at the University of Siegen. Learn more about how competence measurement provides insights into individual strengths and areas of development.

The different competence levels presented in the article provide interesting reading material to deepen your understanding of the diversity of skills and knowledge. Take a look at the different levels and how they can impact personal and professional development.

Invitation to the second COMET network meeting on October 5, 2023.

We are pleased to invite you to the second COMET Network Meeting, which will be held on October 5, 2023. This online event will be a great opportunity to interact with professionals and enthusiasts from different fields and share insights on competency measurement, development and collaboration.

Please mark the date in your calendar and be part of this inspiring event. More details on registration and agenda will be announced in the coming weeks.

We look forward to welcoming you to this momentous event!

In the meantime, we wish you a wonderful summer filled with joy, relaxation and unforgettable moments. Enjoy the warm days and recharge your batteries

Yours

(Ralph Dreher)

Comet Networkmeeting

5th October 2023

Safe the Date!

We cordially invite

Comet in Practise
Workshops
Networking
Future Projects of Comet

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COMPETENCE MEASUREMENT WITH THE COMET COMPETENCE AND MEASUREMENT MODEL

In the realm of vocational education, the aim is to equip learners with the skills needed to contribute positively to both the workforce and society, considering social, ecological, and economic responsibilities (KMK, 1991). This necessitates the acquisition of „vocational action competence" (ibid.), a skill set that learners should develop during their training in order to effectively realize the aforementioned goal of vocational education. Unlike a simple difficulty-based model (utilizing multiple-choice questions leading to true or false answers), vocational action competence is best evaluated using a value-centric ability model (measuring the ability dimension based on specific task characteristics) (Martens, Rost, 2009, p. 98). This approach illuminates „how individuals of varying proficiency levels handle open occupational tasks" (ibid).

The COMET competence and measurement model, utilized by the University of Siegen / TVD, was conceived based on Felix Rauner's theory of multiple competencies (2015). This theory posits that professional action competence is achieved when the following eight requirements/partial competencies for solving a professional task are fulfilled (Rauner, 2018, p. 21 f.):

- Functionality/expertise
  Includes instrumental expertise and context-in dependent technical knowledge.

- Clarity/presentation
  Encompasses the ability to anticipate the outcome of professional actions, facilitating planning, evaluation, and communication of the process.

- Sustainability/use value orientation
  Incorporates consideration of customer-desired value and sustainable implementation in task resolution.

- Economy/efficiency
  Addresses efficiency and economic aspects within the task solution.

- Business and work process orientation
  Incorporates the entire hierarchy and process chain related to task resolution.

- Social compatibility
  Incorporates humane work design, occupational health, safety, and social aspects in the task solution.

- Environmental compatibility
  Encompasses general environmental awareness and adherence to occupational and technical environmental requirements in task resolution.

- Creativity
  Recognizes the sensible fulfillment of creative opportunities for task resolution.

In tandem with two other theories of learning within vocational education, namely the novice-expert paradigm of Dreyfus & Dreyfus (1987) and the theory of complete action by Hacker and Volpert (Hacker, 1992), Rauner and colleagues (2015)

devised a multifaceted approach in the initial CO-MET project to gauge the action competence (development) of educators and learners, rooted in educational theory. This procedure serves a dual purpose: firstly, it sheds light on the strengths and weaknesses of teaching within the framework of the learning field concept; secondly, it guides the evolution of didactic strategies.

In the „Lernorte der beruflichen Bildung" project, researchers from the University of Siegen operationalized the COMET competence and measurement model for assessing action competence among learners in general education schools. This endeavor involved students and teachers from two 9th and 10th grade high schools in Olpe (Hesse)

The COMET competence measurement procedure (according to Rauner, 2008) using Olpe as an example

1. introduction of the project group to the test procedure: Form a team of raters

2. development of test items (designs) and learning items

3. pretests and rater training, rating

4. analysis of pretest results and feedback

5. first main test with learners

6. rating, analysis

7. second main test with learners

8. rating, analysis and feedback

The team of raters, consisting of teachers and researchers, initially creates and tests a preliminary test task (pretest) after undergoing Rater Training, involving two workshops (details below). To gauge learners' ability to perform, they tackle a COMET test task twice (items 5 and 7), with a 90-minute limit. This task assesses task completion across sub-competencies and homogeneity.

For evaluating task responses, the eight sub-competencies are defined by 5 criteria (items) each. This grants raters a set of 5 items per sub-competency for scoring. Raters award points (ranging from 0 for not fulfilled, to 3 for fully fulfilled) based on item fulfillment. A predefined solution space outlines the extent of fulfillment, guided by utility, sustainability, aesthetics, and personal engagement (Rauner, 2018, p. 23).

Raters' scores are summed, averaged, and then multiplied by a factor of 10

Competence levels

The following rules apply to the assignment of learners' performance in a competency level:

Competence level 0: nominal competence
Test persons with this competence level, have only achieved a score below 11.2. They do not yet have professional competence.

Competence level 1: Functional competence
The score of the test persons is above 11.2. They have elementary technical knowledge and skills - an understanding of context is not yet present. Missing point values can be compensated with values up to 8.3 from other competence dimensions.

Competence level 2: Processual competence
This competence level is achieved when the scores for Functional Competence and Processual Competence are both higher than 11.2. Learners who achieve this test result are able to make connections between their tasks and everyday (operational) (work) processes. Missing scores can be compensated with scores up to 8.3 from other competence dimensions.

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Competence level 3: Design competence
Learners who have achieved at least 11.2 points in all 3 competence levels are at this level. At this level, tasks are perceived in their full complexity and solved taking into account a variety of framework conditions. Social and ecological consequences of one's own actions are reflected upon and task solutions are independently developed further.

The test results are presented in the form of competence profiles. They are valuable for teachers and learners because, in addition to the acquired competence, they also show areas of development for future teaching.

Requirements for raters in the Olpe project

The test results can only be used if the raters (teachers and the project participants from the University of Siegen) succeed in evaluating the task solutions in all criteria with a high interrater reliability. Therefore, the main tests are preceded by the joint task development, the pretests and the rater training, with which the participants prepare for their task (Points 1.-3.).

First, the requirements for COMET test tasks are presented and discussed in joint workshops and finally two learning tasks are developed (Point 2.). During the pretest in the rater training, the raters evaluate the task. They check whether the task allows the acquisition of the 8 sub-competencies and the corresponding 5 items each. They decide whether certain sub-competencies/items should be emphasized due to the objective of the task or whether certain sub-competencies/items should be omitted. They revise individual formulations and finally decide on a final version of the learning task.

During the rater training with the teachers in Olpe, the task is designed after 2 pretests in such a way that it allows the acquisition of the targeted competencies and offers sufficient room for maneuver for the independent solution by the learners (Haseloff and Weiß, 2023).

During rater training, raters also practice rating learners' solutions. With the solution space in mind, they rate items step by step and compare their ratings immediately afterwards. If the evaluations differ too much, they justify and discuss their evaluation and search for a consensus. The goal is to find a common rating basis with a high interrater reliability.

Initially, the rating results deviate from each other because raters base their assessment on their own competence and not on the solution space. After reflecting on this procedure, more consistent rating results are found for the student solutions. After two practice runs a final value of 0.8 for the interrater reliability is achieved.

The result of the rater training shows a professional handling of the test procedure by the teachers and also leads to numerous discussions about didactic questions. Up to now, the teachers of the Olper Schulen have rather seldom carried out project-oriented lessons, which focus on the solution of real-life (vocational) tasks. They now see the COMET method as an opportunity to design realistic and interdisciplinary lessons.

In the training situation for task design, a discussion arose at the same time about whether the professional action competence / design competence mapped in the COMET test procedure or

the partial competences set and their items still represent what is considered to be the professional action competence in demand in the current situation. This is particularly true with regard to social compatibility, environmental compatibility and creativity.
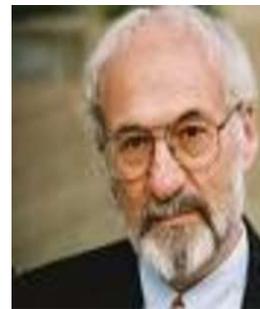
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