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TLIC PAPER

The Coherence between Innovative Teaching Methods and Formative Assessment in Higher Education

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ABSTRACT

Under the umbrella of VUCA-world and growing international competition, the human factors are playing more important role in higher education [9], [18]. Innovative teaching methods and formative assessment are significant transformational part of this process [24]. No doubt, teaching and learning methodology and assessment has strong coherency [19]. This presentation focuses on the relationship between innovative teaching methods and formative assessment. In the first part of the presentation, the philosophical phenomena of this process comes from John Dewey 'learning by doing' principle [8]. Thus, innovative teaching methods have strong impact of different types of interactions and broader meaning of learning, especially problem-, project- and inquiry-based learning [15]. Formative assessment focuses on following students' progression and continuous feedback changing feedback culture in the teaching methods and formative assessment. In the second part of the presentation, the case study from Budapest Metropolitan University gives evidences to this required relationship giving best practices on innovation and formative assessment. Finally, at the end of the presentation, opened conclusion has dilemmas and questions.

KEYWORDS

skill gap, innovative teaching methods, formative assessment, diagnostic assessment, feedback culture

1 CONTEXT

No doubt, innovation is the fundamental engine of rethinking and restructuralization on higher education. Last two decades, there has been growing interests in innovation on teaching and assessment in higher education in order to promote lifelong learning [11], [12], [17], [28]. As Walder stated, "In a complex socio-political-economic academic context, pedagogical innovation unquestionably prevails as one of the solutions to the challenges faced by today's university. It is

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a mediator for change and adaptation, marked more by human interaction than technique, supporting students and facilitating learning and teaching" [28].

Innovation, on the one side, is a noun, a new method, idea or product. But, on the other side, which is more relevant to this paper, innovation is a verb. Namely, the action or process of innovating something. From the point of pedagogical innovation, we need to see the context of the topic at three levels. At the individual level (students or teachers), innovation is based on reskilling, renewing skills, in order to strengthen professionalism and personal mastery. At the team level, innovation is related to effective cooperation and high-quality project work, which has been resulted collaborative professionalism [13].

"Collaborative professionalism is about how teachers and other educators transform teaching and learning together to work with all students to develop fulfilling lives of meaning, purpose, and success" [13].

Collaborative professionalism, from the point of pedagogical innovation, is based on collaborative learning, teaching and assessment. At the organizational level, innovation with strong coherency on creativity and collaboration is the effective transformation to professional learning communities [16], [23]. Basically, collaboration is the fundamental phenomenon of innovation and creativity.

Under the umbrella of, on the one hand, VUCA-world (Volatile, Uncertain, Complex, Ambiguous) and growing international competition, the human factors are playing more important role in higher education [9], [18]. Innovation plays a significant supporting role between uncertainty and certainty in the context of knowledge creation and creativity development [17]. On the other hand, knowledge economy and skill gap, the challenge of innovation in higher education is a relevant hot topic, especially from the needs of renewing teaching methods and assessment functions. In the first approach, the meaning of innovation is technological progress under the context of science and technology. In the second approach, which is more relevant of our topic, pedagogical innovation is "characterized by an intentional action that aims to improve university students' learning in a sustainable manner" [27]. In this sense, the traditional teacher- and teaching-centered higher education has changed to the learner- and learning-centered approach. In fact, learning- or student-centered approach is related to the expansion of higher education in order to promote lifelong learning. In other words, active learning, effective learning strategies, and qualitative knowledge construction and creative knowledge transfer come to the front, which have impact on teaching and assessment as well. One of the biggest challenges is how can higher education institutions handle and transform the above-mentioned changes and processes with the invariable beliefs of learning and knowledge, which have based on memorization, simple repetition, concentration, passive listening and giving knowledge via lecturing. On the contrary, active learning and learner means more emphasis on personalized and collaborative learning focusing on interactions, experience- and problem-based learning via projects. In other words, this is a paradigm shift, from the content- to the competency-based higher education, where learning and learner comes into prominence [20]. In fact, this paradigm shift has enormous impact on changing teaching (methods, roles, etc.), but parallel to this process, it is related to rethink assessment as well.

No doubt, the horizontal strategy of higher education in the 21st century is teaching and assessment for learning. This is the contextual frame, where innovative teaching methods and formative assessment work together in practice. In other word, teaching and learning methodology and assessment has strong coherency [19]. Learning, teaching and assessment process has impact on teaching methodology and learning strategies prioritizing self-directed learning and metacognition. In simple words learners are responsible their own learning [20].

The philosophical phenomena of this process comes from John Dewey 'learning by doing' principle [8]. Thus, innovative teaching methods have strong impact of different types of interactions and broader meaning of learning, especially problem-, project- and inquiry-based learning [15]. Parallel to, it necessary to turn to complex view of learning, teaching and assessment. According to Hattie "the importance of the intent to teach and intentional alignment across decisions about the knowingthat, knowing-how, and knowing-with aspects of curricula. Thus, the importance of learning of cognitive task analysis, optimal teaching interventions, and the assessment or evaluating strategies" [14]. From the point of learning-centered higher education, on the one hand, learners need to reflect their own learning, increasing awareness of effective learning strategies following progression via portfolio or selfassessment. On the other hand, these needs are related to teachers' profession as well.

Thus, growing needs of innovation has economic and pedagogical pillars. Turning back the growing needs of closing skill gap, Olson states:, "In 2012, McKinsey & Company forecasted a troubling outlook on the labor market through the year 2020. The report highlighted three talent shortages across the globe: nearly 40 million too few college educated workers in the global labor market; a 45 million shortfall of workers with secondary and vocational education in developing countries; and up to 95 million workers that lack the skills needed for employment in advanced economies" [21].

As labour markets are dynamic and focusing on raising the output of educational systems, so companies would continue to access the talent they need to sustain growth and create opportunities" [10]. The World Economic Forum and Tata Consultancy Services also analysed the data, opportunities and actions of closing the skill gap, focusing on the needs of skilling, reskilling and upskilling [6]. In this sense, the answer of higher education is significant, namely strengthening competency-based education via mastery of skills and adaptive teaching methods. As the above-mentioned White Paper concluded from the educational point: "Current education policies should be reformed to place greater emphasis on mastery of skills over gaining qualifications. This includes an evolution in the curriculum as well as the modes of instruction to meet the dynamic demands of the new economy" [6].

The key question is: Can higher education systems change and transform dynamic and adaptive ways as labour market?

The needs and enormous challenge is given, but the traditional culture of higher education has huge discrepancy. Obviously, that revision of curriculum is a significant step in order to close the skill gap. Additionally, in the first approach, this is a significant step to increase dynamism and adaptability of higher education. Especially when the strategy focuses on learner- and learning-centered education, the curricula have changed from the former aim-orientation, input-oriented, content-based approach. Output-focused, especially learning outcomes, competency-based curriculum design comes to the front. Worthy of note, that from the needs of dynamism and adaptability of higher education, the most important changing parts of curriculum from the pragmatic point are (i) learning strategies and activities promoting self-directed learning, learning to learn and collaborative learning; (ii) innovative teaching methods and (iii) diagnostic and formative assessment. As a result curriculum is a process and not a product, de facto it is planning for learning. In other words, curriculum is not a noun, it is a verb: "We have reconceived the curriculum; it is no longer only a noun. It is also a verb: currere" [22].

Planning for learning, the process-oriented curriculum, is a broader meaning of curriculum is related to transformation and complexity of higher education. The vertical transformation of the curriculum, from the first perspective, is based on some philosophical foundations and ideologies of education and the curriculum. Evident, that pragmatism and existentialism can handle the changes and the dynamic, adaptive process with the interaction of the individual and the changing social environment. In other words: "The curriculum reflects on the interaction between the learner and the environment, thus it results in the construction of meaning" [26].

Last, but not least, curriculum planning is a consistent part of a continuous circle, which is an innovative and creative process. Just imagine an innovationbased triangle, which has three relevant peaks: curriculum design, learning and teaching development and assessment. From the input-oriented approach, changing the culture and mindset of curriculum planning, learning- and learner-centered curriculum means conscious structuralization of learning outcomes, competencies (knowledge, skills and attitudes), learning activities, teaching strategies, tools and assessment. In other words, changing the curriculum planning from the previous content- to the competency-based approach, where learning and learners come to the front. One of the biggest challenges, that, in the competency-based curriculum, curricular content is the tool for development [5].

Frequently, rethinking and restructuralization of higher education is starting with revision of curriculum planning, which is an input-oriented approach, where the teaching and learning aims play an important role. But, from the output view, the significant and effective starting steps of this process to change the functions of assessment, especially from summative to formative assessment comes to the front, which affects the innovative teaching methods.

As Black and Wiliam defined, "...formative assessment when the evidence is actually used to adapt the teaching to meet student needs" [1].

Formative assessment is for learning under the umbrella of "raising the standards of learning" [1]. The other frequent used short definition is assessment for learning [1], [2], [3], [30].

No doubt, formative assessment promoting learning with following students' progression using rubrics, personalized learning diary and learning portfolio. But turning back to the original definition of formative assessment, we need to see the required coherence between assessment and teaching.

"Teachers need to know about their pupils' progress and difficulties with learning so that they can adapt their own work to meet pupils' needs — needs that are often unpredictable and that vary from one pupil to another. Teachers can find out what they need to know in a variety of ways, including observation and discussion in the classroom and the reading of pupils' written work" [1].

Focusing on higher education, from the above-mentioned process, formative assessment and innovative teaching methods have enormous impact to students' learning. Finally yet importantly, closing the skill gap systematically. Innovative teaching methods and formative assessment are significant transformational part of this process [24]. The feasible and required coherency between formative assessment and innovative teaching methods is based on, among others, continuous response and feedback [4]. In other words, higher education institutions have different feedback culture, using responses and feedback for improving and innovation of learning and teaching.

Parallel to this changing feedback culture, using evidences via adaptive teaching "to meet student needs" is starting with diagnostic assessment.

"There is no sharp distinction between formative and diagnostic assessment, nor does a universal definition for diagnostic assessment exist. However, it is usually described as a kind of assessment which focuses on problems, explores possible difficulties, assesses if students are prepared for a learning task, and thus may measure prerequisite knowledge as well" [7]. In this sense, turning back to the above-mentioned innovation-based triangle, which has three relevant peaks: curriculum design, learning and teaching development and assessment. Sharing the aims and expectation in order to "adapt the teaching to meet student needs", mapping students' prior knowledge, using selfevaluation diagnosing students' strengths and weaknesses and making pre-test (then at the end of the semester post-test) measuring personal components. Later following the progression is the significant starting point in the beginning of the semester. In this perspective, we have many diagnostic data for improving learning via innovative teaching methods such as brainstorming, making mind maps, using place mat, organizing projects, working in cooperative teams, debating and questioning.

2 **PRACTICE**

In Budapest Metropolitan University at BA and MA levels, there are several innovation-based courses, which have evidences on the above-mentioned required coherency between innovative teaching methods and formative assessment. For instance, the project-based course Social Studies, which is focusing on problem-, project- and inquiry-based learning. Turning back to the above-mentioned innovation-based triangle: curriculum design, learning and teaching development and assessment, in the case of this course, curriculum development has based on collaboration. The teachers share, firstly, their visions of teaching and learning, experience on content and competencies, last but not least, assessment. They discuss a lot about the purpose of the subject and learning outcomes in order to define some basic competencies, which have transversal function and phenomenon on the process of learning and teaching at the semester. The purpose of the subject and learning outcomes are as follows.

The students be able to evaluate the advantages and difficulties of project work. On the other hand, students be able to diagnose the social problems and be able to focus on them. The learning outcomes are students be able to compare and discuss different problem fields and potential project topics in an evidence-based professional way. Students be able to make collaborative research plan (planning and development), be able to make documents and evaluation about the progression of the project. Students be able to understand the advantages and difficulties of qualitative research methods. At the end of the course, students be able to cooperate, to work in collaborative project work. Students be able to do collaborative presentations and evaluation on the project work. Students be able to reflect own project work and reflect others work. At the end of the course, students be able to solve problems in a creative way, be able to listen and understand others opinion, make conscious decisions.

The developmental basic competencies are communication, cooperation and creativity. Basically, this is a competency-based approach of curriculum planning, but the teachers need to define the core content of the course as well.

Introduction, which includes sharing the aims and expectations, mapping students' prior knowledge; research methodology; qualitative research methods, which includes objectivity, validity, reliability, research ethics, research plan, research questions; sharing and discussion about the potential research topics, social problems, and research questions; planning, development of project work, documentation on progressions of project work; sharing and finalizing the evaluation criteria; presentation of the project work and collaborative assessment; and closing, summary, and reflexions are all aspects of this approach.

This is an output-based curriculum planning; it means parallel to define learning outcomes, focusing on students' portfolio is evident on this process of curriculum planning. The feasible products that my become part of the students' portfolio are: project plan, research progression report, mindmaps, presentations, self-reflective essays, short films.

Finally, the main character of evaluation of the course is balancing diagnosis, formative and summative assessment; diagnosis of prior knowledge, interest and competency strengths with self-evaluation are involved. Regarding after the progression, evaluation focuses on continuous feedback and assessment of project plans, progression and presentations on the base of sharing criteria. Evaluation criteria have two pillars: content and presentation. From the point of content, the criteria are: relevance, coherency, and consistency. From the pillar of presentation: visuality, understanding, and creativity are considered.

Turning back to the above-mentioned innovation-based triangle, learning and teaching development and assessment, it starts with provocative questions to the students: Why are you here? The students need to formulate their aims and expectations of the course. No doubt, this process is unusual to the students, but from the point of evaluation, it gives many evidences on students' attitudes and way of thinking. From the formative assessment view, these aims and expectations are going back at the end of the semester in order to collect some students' feedback. Under the umbrella of diagnostic assessment, the next activity is an introductory game, where students need to know each other. Firstly, they need to introduce themselves using first name's letters (not each) to tell each other some personal characteristics. For instance, my name is Vili, I am very intelligent and innovative. The next part of the game is introduction your classmates, how can you concentrate other student's characteristics. It is important; do not use each letter on your first man for introduction. Flexibility can promote making creative ideas and respect each other's as well. From pedagogical point of view, it is valuable to face to different ways of thinking and to know your students' characteristics. At the end of the semester, it is important, because of following the progression, turning back to these personal characteristics via self-evaluation checking the changes or potential developmental areas. Next part of the course is mapping students' prior knowledge using brainstorming, place mat and mind map on project or project-based mindset. Brainstorming is based on collecting first ideas about the project, then using these ideas organizing groups making place mat. The key question is: Why is project-based mindset is important in the 21st century. Students (4 of each group) need to answer, firstly, individually this question, then they discuss together about the common point. Finally, students need to make a mind map on project answering three questions: (i) What kind of knowledge do you use in the project work? (ii) What kind of skills are relevant of your project work? (iii) What kind of attitudes do you have in the project work? We are making a collaborating mind map making a competency structure of the projectbased work using later these three pillars for following the progression at the of the semester. On the base of the results of the introductory game, brainstorming, place mat and mind map, students need to fill in a short self-evaluation for in order to indicate their strengths and weaknesses of the project work. It is a useful evidence following their progressions at the end of the semester as well. In order to strengthen different feedback culture, we negotiate with the students using feedback cups during the semester. Red cup is for questioning, discussing and evaluating about the relevant, pragmatic, opened questions. Basically, questions are welcome and appreciate during the course. Yellow cup is for understanding, students need to indicate immediately if they do not understand anything. This process requires, on

the one hand, continuous feedback. On the other hand some differentiated teaching and methods and students' tasks. Green cup represents "flow" feeling, when we are making, presenting, evaluating and celebrating the projects under the creative atmosphere. Following the progression has two types: first, using diagnostic and formative assessment, students' progression comes to the front. Second, writing Progress Report is focusing on project progression answering some questions at the middle part of the semester: What we did? What we are going to do? Any risk factors? How do you see success criteria?

Writing Progress Report requires collaboration and this process is the middleterm of the project work. Turning to the end of the semester, the project teams present their work on the shared evaluation criteria using collaborative assessment and feedback culture. The teams need to make a reflective report summarizing the main outcomes of the projects, advantages and difficulties of the collaborative work. Last but not least, individual feedback with summarization of the evidences on progression and feedback window is closing the semester. Feedback window has four parts: What did I learn? What about my feeling? Any question? What about usefulness of the course?

3 CONCLUSION

No doubt, innovative teaching methods and formative assessment has strong coherency. Basically, assessment has strong, significant feedback to the learning and teaching process, thus changing the evaluation and feedback culture have enormous impact of the quality on learning and teaching. In this sense, diagnostic and formative assessment are the pragmatic and useful function change planning curricula, learning, and teaching process. From the point of curriculum planning, this an outcome-based approach, where the learning outcomes and portfoliobased higher education come to the front. Learning and teaching process focuses on innovation, creativity, personalized, and collaborative learning. In spite of the pedagogical added value, the required coherency between innovative teaching method and formative assessment, at the systematic point, can closing the skill gap via turning to the competency- and portfolio-based education. Pragmatism and "learning by doing" philosophy are the fundamental educational strategy in order to create collaborative feedback culture and promoting learning using diagnostic and formative assessment effectively.

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