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STUDENTS' AND HIGHER EDUCATION STAKEHOLDERS' CONCEPTS OF RESILIENCE IN THE CONTEXT OF INNOVATION CAMPS

Stakeholders of Higher Education are dissatisfied with students' and graduates' level of resilience to failure. Students feel most threatened by ill-defined problems, unpredictable professional life situations which demand unscripted responses, and sustained relationships. Students identify the fear of being judged as “losers” by their peers and professors as the main obstacle to take initiative and risks in the context of Higher Education (Weiner 2014). The universities which strive for connecting their education to the needs of the working life shift their focus from individually assessed learning outcomes and content-based competences to more networked and generative ones. They develop and adapt new teaching methods to match the more innovation oriented teaching aims. Best practices like innovation camps or “hatcheries” are based on real working life divergent problems which students need to research and solve. While the new learning outcomes and the methods are more widely accepted the stakeholders of such innovation pedagogy lack tested practices for validating the new competences of the students. Faculty members could benefit from some insights into the individual and social processes taking place during those form of learning to better understand the students' needs and concerns over the innovation pedagogy radical methods and the stakeholders' expectations of the new competences.

In basic classifications of educational philosophies the traditional orientation is the legacy of Herbartianism based on the “Five Formal Steps of the Recitation” as *preparation, presentation, association, generalization, and application*. The “Prussian” idea of education designed for industrialized society relied on authoritarian “instruction enforcing the transition from order to discipline determining the instructed learner's will towards virtue” (Knox 1975, p. 267). The contrasting orientation follows the progressive thought of John Dewey who in the spirit of Darwin's biology that “the purpose of life is simply more life” believed that the education should serve further human growth. In the progressive orientation learning is designed through divergent challenges and

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stimulating, democratic environment to nurture “a continuum of human experience that related rather than separated thinking and acting, fact and value, and intellect and emotion” (H. Putnam & A. Putnam 1993, p. 368).

The theory of constructive alignment (Biggs 2003) suggests that all three main elements of education – namely aims, methods and ways of assessing learning outcomes – should be in line. Higher education has traditionally relied on individual competence, and innovation has also frequently been seen as an activity of an independently working “propeller-head”. As the world is becoming increasingly complex and the amount of information is growing, it has become even more evident that only a few can vanquish the collective strength of a group by individual actions. Interaction skills are important to help bounce one’s own thoughts off a group for feedback and develop them this way into even better and more competitive ideas. The significance of good networks and networking has similarly become more important. Networks create safety when actions can be brought forward with people other than complete strangers. Networks complement the competences of those participating in them with the principle of mutual benefit, trust and resilience. According to the wide research ‘Oivallus’ – conducted by Confederation of Finnish industries (EK) – the business and companies are expecting their current and future employees to have innovation competencies – especially such as abilities to cooperate and network – which cannot be assessed with traditional tools (EK 2011).

Innovation pedagogy is a learning approach that defines in a new way how knowledge is assimilated, produced and used in a manner that can create innovations. It aims to enable the development of innovation competences, alongside with the study field specific learning outcomes. It focuses on abilities in creative problem-solving, system thinking, goal orientation, teamwork, and networking. The overarching value promoted by this pedagogy is respect for diversity and open-source principle for sharing of the declarative knowledge and novel ideas. The main effort of innovation pedagogy is to bridge the gap between the educational context and working life (Penttilä 2016). It assumes that learning is deeper when previously-gained knowledge is continuously applied to practical contexts where reflection and instructional feedback is designed to further develop both the specific novel services, products and organizational or social innovations – new added value – as well as competences, which are applied to an innovation process. (Gibbons et al. 1994; Kairisto-Mertanen et al. 2010; Nonaka & Takeuchi 1995; Nowotny et al. 2001; 2003). The innovation pedagogy methods such as research or project hatcheries, hackathons or innovation camps are based on the fluidity of roles. Masters and disciples often switch the positions as both are equally motivated to respond to each other’s’ creative initiatives and find a novel solution. Innovation camps, in particular, engage students and stakeholders (expert instructors, university

facilitators, challenge owners from working life, community leaders). The participants work in international and interdisciplinary teams on the divergent challenge. They are encouraged to use specific design, creative thinking, business planning tools and strategies to come up with ideas for ventures that would impact the local eco-system. During approximately 30 hours of intensive problem solving the teams benefit from feedback sessions in which the groups present their work in progress¹.

Theoretical framework for educational resilience

Bakhtin – a Russian philosopher of dialogue (Bakhtin 1990) inspired many pedagogues who subscribe to the progressive philosophies of education. In his concept of learning we benefit from engaging in a dialogue and we are transformed through each other's responses, a dynamic cycle which impacts interlocutors' consciousness or perspective. Learners initiate dialogue, offer a statement or question and expect a reply which produces actual change in the state of the arts. The dialogical student is always in an intense relationship with the other. The ideas are addressed to a listener and a response is anticipated and welcome. When words or actions representing concepts, facts, emotions, curiosity etc. are offered to produce a response, the interaction may have a combative quality but it is always oriented towards some new awareness and competency. Bakhtinian dialogue, however, "resists closure or unambiguous expression, and fails to produce a 'whole'. It is a consciousness lived constantly on the borders of other consciousnesses" (Robinson 2011). Bakhtin promoted the idea of "creativity borderland made up of many worlds", all equally capable of expressing themselves and conceptualizing their objects. "Everything is said in response to other statements and in anticipation of future statements" (Robinson 2011).

Dialogical pedagogy requires specific resilience and integrity – the continuous mindfulness of subjects involved who answer to each other whenever they change positions to unfolding events and their socially constructed meanings. People constantly struggle against external definitions of their thoughts and actions, which have a deadening effect on them or becomes the root of their failure perceived as inability to meet social expectations. Creativity of an individual can only be actualized through a free discursive act, and not in a pre-defined context. Engagement in a dialogical interaction, therefore, builds resilience, the ability to fail and persevere for the sake of innovating in a space and time with the community of learners who defy any externally imposed norms (Jagiello-Rusilowski 2017).

¹ The method of the innovation camp is further described at www.innocamp.pl [12.12.2016].

Bakhtin's theory redefines resilience by offering the dialogical relationship and the liberation of the ethnocentric self, bounded by the authority and its value system. Dialogical self becomes resilient to failure through the strength and support provided by the diversity of interlocutors, shared flexibility of perspectives and mindfulness of the responses offered spontaneously along the unfolding situations rather than the predictable standards. The pedagogical assumptions about the potential of dialogue makes Bakhtin a precursor of Paulo Freire radical pedagogical concept of praxis "reflection and action upon the world in order to transform it" (Freire 1974, p. 36).

Freire insisted that education is oriented towards the future which offers the next generation a life that leads to the deepening of freedom and social justice and "concern with keeping the forever unexhausted and unfulfilled human potential open, fighting back all attempts to foreclose and pre-empt the further unraveling of human possibilities, prodding human society to go on questioning itself and preventing that questioning from ever stalling or being declared finished" (Bauman 2001). Within this theoretical framework the resilience was built through mutual problem posing and dialogical engagement rather than a one way transmission or "depositing" ready-made knowledge. Freire saw an ethical imperative to cross borders of cultural identities and status and he understood the educational resilience as persevering in seeking social justice, acting for empowerment and opposing any forms of oppression leading to failure. Crossing the lines of difference through unprejudiced dialogue and integrity self-vigilance constituted the essence of solidarity-based learning and social innovating (Jagiello-Rusilowski 2017).

Study design and methodology

Within the above theoretical framework it can be assumed that innovation camps, as one of the methods of dialogical pedagogy, offer ample opportunities for the students to experience and critically reflect on how social pressures impose the fear of failure and what is the role of resilience in innovating. The aim of the study was to find out how students and other stakeholders of higher education (educators, working life and community leaders) conceptualize resilience as a learning outcome of innovation pedagogy. The main research question was how resilience of international students is self-perceived in the innovation camp setting and if the dialogical interventions of this form of learning effect the self-efficacy beliefs. The hypothesis was that elements of collaborative dialogic innovation pedagogy raise self-efficacy beliefs of the participants about their resilience. There were three groups of international students who took part in a 36 hour innovation camps in two different locations in Poland and Indonesia. 30 students aged 21-39 were randomly chosen from the first and the third

groups, which were larger while the second one had exactly 30 participants who all filled in the input and output Barometer tests. All the groups were multicultural, the students coming from 12 countries and 3 continents in the first case, from Poland and Israel in the second, and in the case of Indonesia the students although from one state had diverse cultural and religious backgrounds.

The level of self-efficacy beliefs on innovation competences was tested in the three groups twice: at the input level, in the first 2-3 hours of the intervention, and at the output level after 6 days of collaborative work, presentations of the outcomes (pitching of innovation ideas) and the final evaluation of the camps. The innovation competence barometer (INCODE barometer) was developed at Turku University of Applied Sciences (Watts et al. 2013a; 2013b). It is a scoring rubric that considers three dimensions of capacities and skills: individual, interpersonal and networking. The individual capacity integrates the behaviors or skills that allow a person to innovate in the personal execution of tasks. The interpersonal capacity enhances the individual ability to innovate through the interaction with a group and represents the behaviors or skills that make others move towards the objective. The networking capacity represents the behaviors or skills that enable a group to find appropriate solutions in the process of completing tasks in a broader environment than usual. The barometer can be used for self, peer, and external analysis; here the self-evaluation was selected. The INCODE Barometer works similarly to Bandura's (Bandura 1999) self-efficacy beliefs test with the scale from 0 to 10 with the lowest value showing the absence of the given efficacy belief and the highest rating it as excellent.

Two workshops with higher education institutions stakeholders were organized as part of the study design in order to narrow down the scope of the competences related to resilience as predictor of individual contribution of a graduate to innovation culture of both university and working life interdisciplinary and intercultural teams. The first one happened during international educational technology conference (in Valencia, Spain²) and was run by the authors while the other one was part of Erasmus Plus Project called ARTPAD (Achieving Resilience Through Play and Drama³). It was run by dr Paul Schober at Hafelekar (Austria). The selected student participants of the innovation camps offered their short narratives with insights on how they understood their own resilience in the context of innovating. The content of the participants conceptual choices and narratives became the source texts for a GABEK analysis in which compressed meanings were extrapolated with the use of the PC program WinRelan (Zelger 1999) to reveal a consistent system of beliefs, interconnecting knowledge about

² 10th International Technology, Education and Development Conference, Valencia, march 2016.

³ <http://artpad.epraxis.co.uk/> [15.12.2016].

causes and effects, emotional attitudes in the form of “Gestalten trees”, “causal networks”, “assessment profiles”.

The study results

The INCODE Barometer test results showed the differences between the input and the output values of the innovation competences for all the three groups participating in the innovation camps in all capacities (individual, interpersonal and networking). While the differences between the input level among the groups are high, with the much lower values in the third group, the differences are not so much evident in terms of the overall perceived innovation competency level for the output (after innovation camp intervention) results.

The networking capacity shows the highest increase as the average absolute change value of the three groups – 2,47 (on 0-10 scale) with the strongest differences in applying ethical values, especially in the EU student group (4,40) and the Israeli group (4,10), even though the third group (Indonesian) was not affected (0,40) as the input level was already very high (9,3 compared to 3,5 and 4,2 respectively). The second strongest effected capacity (1,54) was the interpersonal competence with the highest changes in the levels of efficacy in establishing constructive group relationships through a dialogue (with the average of 2,63).

Identifying relationships among different components of the creative tasks increased significantly in groups 1 (by 2,60) and 3 (4,20) while it was not manifested in the Israeli group whose input level was already very high (9,3 compared to 5,2 and 2,7). The foresight level significantly changed for the EU (4,70) and the Israeli groups (2,80). The strongest change is evident in the dialogical efficacy, which amounted to 2,63 showing the highest impact on the EU students group (3,40). The increase in the self-efficacy on active listening skills was significant for the EU group (2,70) and for the Indonesian students (2,40). The last group was also affected in the self-efficacy on initiative and mobilizing others (3,80 and 4,80).

GABEK analyses results

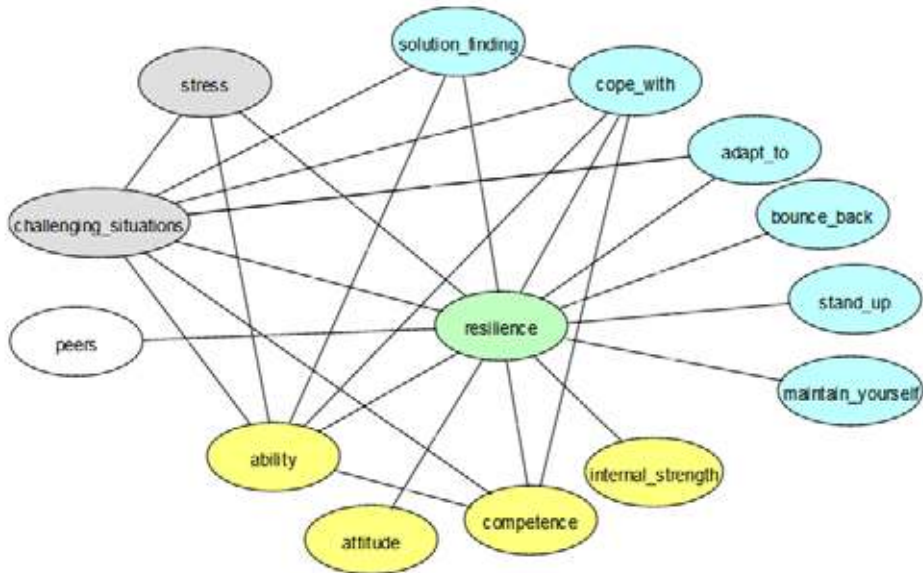
The higher education stakeholders with expertise on social competences (ARTPAD project) conceptualized resilience in relation to a challenging or difficult environment (e.g. stress). They understood resilience as an ability, competence, internal strength or individual attitude and they could observe resilience in activities like coping with or adapting to difficult situations, problem solving and solution finding, standing up, maintaining yourself and bouncing back. The support for resilience for young people

Table 1. The INCODE Barometer test results

INDIVIDUAL	Input 1	Output 1	Absolute change	Input 2	Output 2	Absolute change	Input 3	Output 3	Absolute change	Avg. abs. change
1	2	3	4	5	6	7	8	9	10	11
1 I present ideas that are suitable for the task	8,8	9,6	0,80	9,4	9,7	0,30	6,8	9,7	2,90	1,33
2 I present creative ideas	6,3	8,5	2,20	8,3	9,1	0,80	4,9	8,7	3,80	2,27
3 I present new ways to implement ideas	5,4	7,9	2,50	7,6	8,4	0,80	4,3	7,4	3,10	2,13
4 I evaluate the advantages and disadvantages of actions	7,1	7,4	0,30	8,8	8,9	0,10	3,8	8,5	4,70	1,70
5 I identify relationships among different components of the task	5,2	7,8	2,60	9,3	9,4	0,10	2,7	6,9	4,20	2,30
6 I face the task from different points of view	7,4	9,6	2,20	8,6	9,3	0,70	3,1	8,4	5,30	2,73
7 I use available resources ingeniously	7,6	9,4	1,80	9,5	9,6	0,10	8,6	9,4	0,80	0,90
8 I foresee how events will develop	3,6	8,3	4,70	6,1	8,9	2,80	7,9	9,6	1,70	3,07
9 I show enthusiasm	9,2	9,6	0,40	7,5	8,2	0,70	9,5	9,7	0,20	0,43
10 I persistently pursue the goals	8,6	9,5	0,90	8,5	9,8	1,30	8,6	9,4	0,80	1,00
11 I take daring yet reasonable risks	9,6	9,2	-0,40	7,9	8,1	0,20	8,5	9,7	1,20	0,33
12 I orient the task towards the target	8,3	8,1	-0,20	8,7	7,3	-1,40	9,2	8	-1,20	-0,93
Average:	7,26	8,74	1,48	8,35	8,89	0,54	6,49	8,78	2,29	1,44
INTERPERSONAL										
13 I transmit ideas effectively	8,8	9,3	0,50	8,9	9,2	0,30	6,4	8,3	1,90	0,90
14 I listen to teammates	6,9	9,6	2,70	8,2	9,6	1,40	7,3	9,7	2,40	2,17
15 I establish constructive group relationships through dialogue	6,4	9,8	3,40	7,3	9,3	2,00	7,2	9,7	2,50	2,63
16 I collaborate actively	7,4	9,1	1,70	8,5	9,2	0,70	8,5	9,3	0,80	1,07
17 I contribute to group functioning	8,7	9,5	0,80	9	9,7	0,70	6,9	9,2	2,30	1,27

1	2	3	4	5	6	7	8	9	10	11
18 I take initiatives	6,9	7,9	1,00	8,7	7,9	-0,80	4,8	8,6	3,80	1,33
19 I drive others to act	9,1	7,9	-1,20	7,8	7	-0,80	4,1	8,9	4,80	0,93
20 I face conflicts with flexibility to reach agreements	4,8	7,4	2,60	6,1	8,9	2,80	9,2	9,9	0,70	2,03
Average:	7,38	8,81	1,44	8,06	8,85	0,79	6,80	9,20	2,40	1,54
NETWORKING										
21 I apply ethical values	3,5	7,9	4,40	4,2	8,3	4,10	9,3	9,7	0,40	2,97
22 I take into account the implications of the task for society	6,8	8,7	1,90	7,5	9,1	1,60	8,3	9,6	1,30	1,60
23 I am able to work in multidisciplinary environments	8	9,4	1,40	6,1	9	2,90	4,2	9,4	5,20	3,17
24 I am able to work in multicultural environments	7,9	9,7	1,80	8,5	9,8	1,30	5,9	7,9	2,00	1,70
25 I use networking contacts to reach goal	4,6	8,4	3,80	7,4	9,4	2,00	6,8	9,7	2,90	2,90
Average:	6,16	8,82	2,66	6,74	9,12	2,38	6,9	9,26	2,36	2,47

Source: own outputs based on the INCODE Barometer as described in Keinänen M., Ursin J. & Nissinen K. (2016). *How to measure students' innovation competences in higher education: Development of an assessment tool*, Unpublished manuscript.



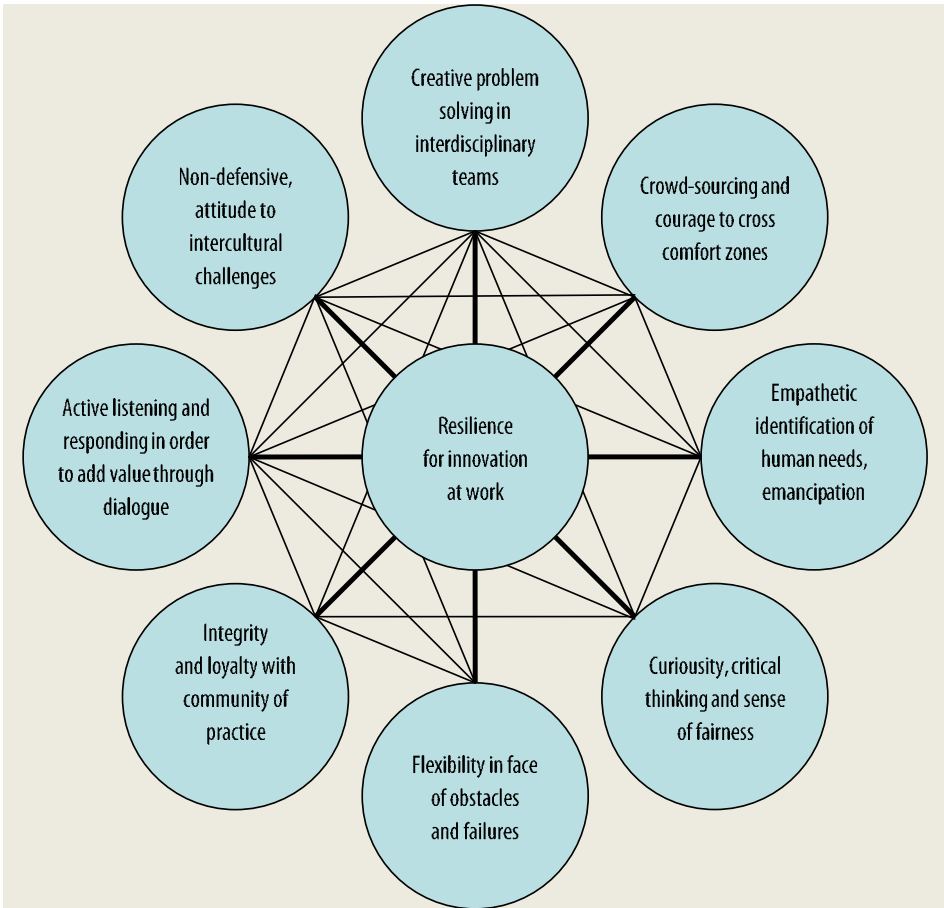
Graph 1. Resilience ontology (Schoeber/ARTPAD project, 2017)

comes mostly from peers in the context of task oriented divergent team efforts and explorations.

The higher education stakeholders meeting at the educational technologies conference conceptualised resilience in relation to interpersonal and networking capacities sought by working life. The key abilities included: active listening and responding in order to contribute to unfolding professional interactions, non-defensive attitude and flexibility in the face of challenging intercultural problem solving activities.

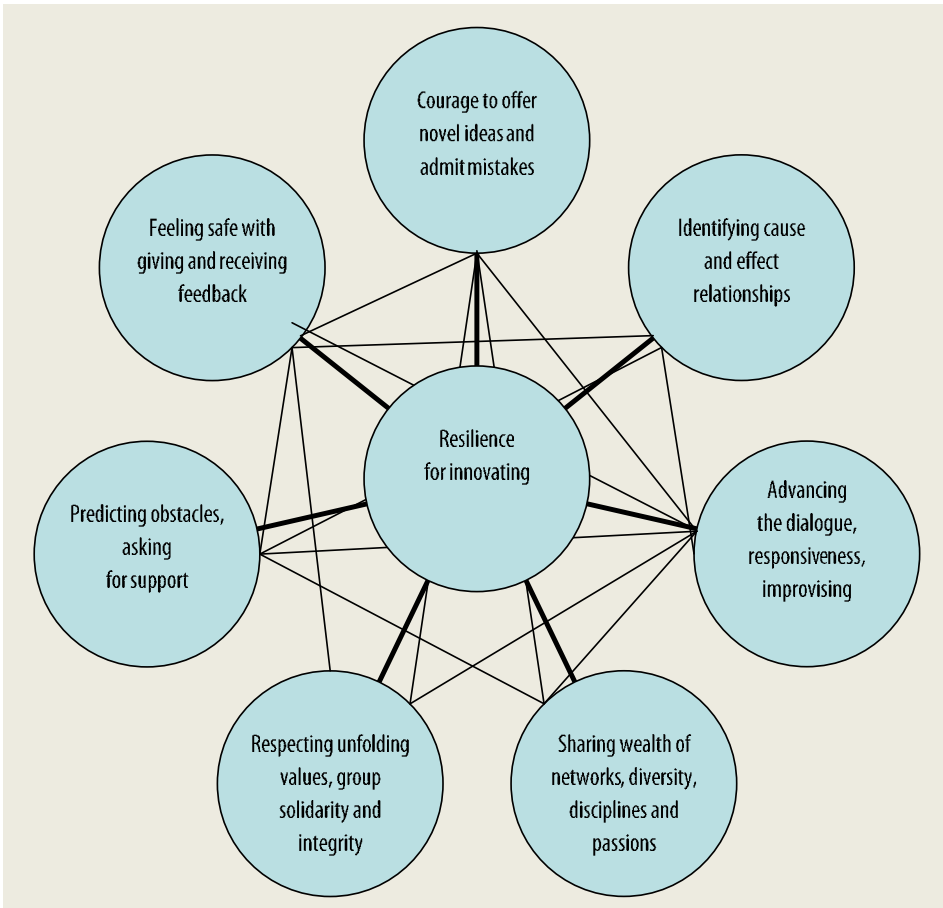
Resilience was described also as a capacity indispensable to take risks and the base for courage to leave the comfort zones for unforeseen experiences and consequences. A resilient student and an employee is capable of empathising with others and therefore identifying their needs, which is both strongly linked to the ethical fibre, loyalty to the community of practice (not just an organization) and the sense of fairness. According to the stakeholders resilience is both built by experience of democratic relations and when already fortified it guarantees a drive for creative problem solving and change-making.

The students participating in the innovation camps conceptualized resilience in relation to the capacity to contribute and advance dialogical group processes which lead to novel solutions to challenges. Resilience means responsiveness, feeling safe with the group in new situations requiring improvisation, sharing creative ideas but also doubts,



Graph 2. Resilience Ontology by stakeholders from the conference (authors' own output)

ignorance, admitting to being wrong, feeling comfortable with giving and receiving the feedback. A resilient student is capable of predicting obstacles and facing rather than avoiding them while being faithful to the group's integrity, its dialogically revealed values. He or she is not afraid of asking for support before it's too late and offers own wealth of knowledge and support networks. Resilience is built in diverse experiences of seeking non-existent solutions, going to unknown territories, giving up comfort of knowing the answers and narrow fields of expertise, sharing the risk of failure for the sake of improving the state of the art.



Graph 3. Resilience Ontology by students (authors' own output)

Discussion of the results

The stakeholders' conceptualizations of resilience matched the following items of the INCODE barometer: 2, 3, 5, 8, 14, 15, 20, 21, 23 and 25. Since all the items had absolute value change the authors argue that some evidence comes from the testing to suggest that resilience is developed in dialogical and collaborative "chronotopes" of innovation pedagogy, in particular during the intensive method of innovation camp. The common element of resilience ontology for the three quoted groups of higher education stakeholders and students was the capacity for problem solving and novel solution finding under stressful or challenging conditions. Students self-reported efficacy beliefs

on that capacity expressed in items 2 and 3 of the INCODE barometer on 0-10 scale show substantive absolute change by up to 3,8 points after the participation in innovation camps. The absolute change values of items 5 and 8 confirm also the intuitive understanding of resilience as the ability to predict and discern causal relationships of own and team efforts, especially in terms of identifying the source of failure at different stages of problem solving. High absolute change values for items 14 and 15 confirm that innovation camp is the environment in which resilience, understood as the ability to engage in dialogical relationships, is developed. Innovation camps build resilience by encouraging the students to listen actively to peers and experts for feedback and respond to unfolding new opportunities contributed by each team member. Future innovators also learn how to manage conflicts creatively, so failures are avoided by prevention of unproductive conflicts or lack of agreement on how to advance the innovation processes (item 20).

Since the highest average absolute change was observed in the cluster of networking competencies of the Barometer (2,47) it can be concluded that innovation camps strongly address the needs of both the students themselves and the stakeholders (especially employers) for stronger integrity, ethical fiber and courage to cross the boundaries of disciplines or specific cultures to find a novel solution. Dialogical relationships and innovation camp tools allowed most students to switch off their strong ego defenses against being judged morally. They had opportunities of exchanging ethical perspectives but more importantly becoming aware of emotions either limiting or enhancing self-efficacy beliefs about their integrity as an important element of being able to function in strong networks. The camps allowed the students to re-define the integrity as the source of their resilience from just another element of competitiveness to the core of individual and collective accountability. The camps provided safe and positive interdependence, relief from the pressure of individual decisions which affect collective sense of ethical solidarity and resilience. They also helped the students to break free from harmful self-censorship preventing the expression of diversity and reluctance to take risks which innovating incurs.

The theoretical framework of dialogism and critical pedagogy proved useful in identifying the connections between the opportunities created during the inno-camps for the students to experience and critically reflect on how social pressures impose the fear of failure and how their awareness of resilience is crucial for innovating. The way all the stakeholders conceptualize resilience as a learning outcome of innovation pedagogy helps the experts to better plan educational interventions. The elements of collaborative dialogic innovation pedagogy evidently raise self-efficacy beliefs of the participants about their resilience which further impacts their innovation competencies.

The study faced some difficult methodological challenges as data was collected anonymously. The number of fully completed tests was not big enough to carry out statistical analyses. The future efforts will focus on better planning of the research design to include more rigorous qualitative tools to look provide stronger evidence for the innovation camp method to be effective in building resilience and integrity as important learning outcomes of innovation pedagogy.

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SUMMARY: Graduates who are potential change-makers, able to persevere in the face of adversity, are crucial for the working life and societies challenged by global changes. The authors explore conceptualizations of resilience in the context of innovation pedagogy. The meanings are revealed from the narratives of some stakeholders and students and then confronted with the results of the innovation barometer test administered to innovation camp participants. The theoretical framework for conceptualizing resilience comes from the radical pedagogy of Freire and the literary theory of Bakhtin.

The findings allow the authors to interpret resilience as the capacity for perseverance and problem solving under challenging conditions. Students self-reported efficacy beliefs on that capacity rise after the participation in innovation camps. Other values on innovation barometer confirm the intuitive understanding of resilience as the ability to predict and discern causal relationships of own and team efforts to prevent or capitalize on failure.

KEYWORDS: resilience, innovation camp, improvisational drama, academic integrity.

ZNACZENIE PRĘŻNOŚCI (REZYLIENCJI) DLA STUDENTÓW, PRACODAWCÓW I KADRY UCZELNIANEJ W KONTEKŚCIE OBOZÓW INNOWACYJNOŚCI

STRESZCZENIE: Pracodawcy i społeczności niepokojone różnymi globalnymi wyzwaniami poszukują absolwentów uczelni odpornych na przeciwności losu, nierezygnujących z chęci udoskonalania świata. Autorzy artykułu badają rozumienie prężności (resilience) w kontekście pedagogiki innowacyjności. Różne interpretacje znaczenia prężności wyłaniają się z narracji badanych interesariuszy szkolnictwa wyższego i studentów, a następnie są one zestawione z wynikami testów „barometru innowacyjności”, które na wejściu i wyjściu wypełnili uczestnicy trzech obozów innowacyjności. Podstawy teoretyczne badania zostały zaczerpnięte z radykalnej pedagogiki Paula Freire’a oraz teorii powieści Michaiła Bachtina.

Prężność jawi się w badaniach jako pojęcie obejmujące zdolność do rozwiązywania problemów w niesprzyjających okolicznościach. Przekonania studentów co do owej zdolności stają się silniejsze

po udziale w obozie innowacyjności. Wartości „barometru innowacyjności” związane z przyczynowo-skutkowym związkiem nakładu pracy i powodzeniem osobistym lub zespołowym także rosną, wskazując na zbieżność intuicyjnego rozumienia prężności z realną oceną własnej zdolności zapobiegania lub uczenia się na błędach czy porażkach.

SŁOWA KLUCZOWE: prężność, obóz innowacyjności, improwizacja, spójność etyczna.