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Knowledge Transfers Between Academia and the Creative Industry

Gregory Curda[1] and Knut Ingar Westeren[2]

[1]Faculty of Social Sciences, Nord University, Steinkjer, Norway
[2]Faculty of Social Sciences, Nord University, Levanger, Norway
gregory.j.curda@nord.no
knut.i.westeren@nord.no

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Abstract: Knowledge transfer has, for many years, been a subject of research viewed from many different aspects. Education is one main vehicle to upgrade the knowledge of the workforce and to train students in gaining the ability to transfer that knowledge to their employers. There is growing research on how a successful education gives the students the appropriate knowledge and the ability to transfer. In this study we look at one subfield that so far has gotten limited attention, namely how successful a university level education is in arming students with the knowledge required by the creative industry and the best possible dynamic between university and creative industry. The data material is based on a structured questionnaire to professors, students and professionals from the creative industry in Mid-Norway and we investigate transfer processes between these groups. The most triggering part of the project is the analysis of the degree to which the programs stimulate and develop the student's creative abilities in a way that is consistent with industry needs. Occasionally, professionals from the creative industry claim that university education lowers the creative potential of the student instead of increasing it. Key findings of the results indicate that the university must be better able to balance tacit and explicit transfers to the students so they may carry it forward to the creative firms. Another important discussion is how to match and balance the cultural contexts of the students, the university and the creative industry to reach optimal results.

Keywords: knowledge transfer, creative industries, university education

1. Introduction

The study of university/industry relations occupies an important place within academic research and more applied project-oriented work has developed in recent years around the question of how industries can utilize knowledge for a better fulfilment of their goals, including maximizing profits, increasing innovativeness, and developing long-term competitiveness. This interest in collaborations between universities and business is due to the recent developments in technology viewed from two standpoints. We have seen a rapid change in the utilization of technological equipment in production activities – from aquaculture to creative industries – where core competences have changed fundamentally because of new Information and Communication Technologies (ICT). The other aspect is that technologies used in knowledge transfers also have gone through radical changes. Within this picture we still have the demand for creativeness, especially in what we call the creative industries, which often are looked at as a source of stimulating impulses to the business community in general. In this context we raise a question about the current state of university/industry relations and how they should be looked at from the standpoint of the student, the university, and creative industries. This leads to the following research questions:

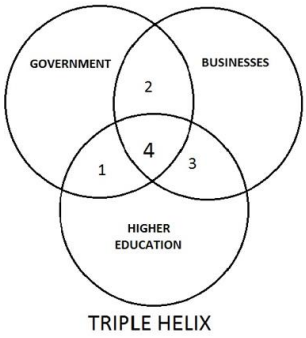
RQ1: Does the university and the creative industry have an optimal collaborative model?
RQ2: Are there conflicting interests between the university's need for scientific rigour, the students' ambitions, and the needs of creative industry?
RQ3: Is the knowledge transfer process organized in an optimal way?

The article is organized in such a way that we initially present a discussion relating to how some of the different theoretical aspects are presented in the literature. Then we give a presentation of the data material based on a structured questionnaire to professors, students and professionals from the creative industry in Mid-Norway. Finally, we present an analysis, conclusions and suggestions for further research.

2. Literature review

The focus of the article and the research questions lead to a presentation of some central theoretical questions to shed light over the analysis. We start with the theme of the Triple Helix model to examine the relationship between the university sector, industries, and authorities. The second important discussion here is about the nature of knowledge transfers, and in the third part we will present a more detailed look into how teaching and collaboration between students, professors, and the creative industry takes place.

The Triple Helix model, Etzkowitz and Leydesdorff (1997), Etzkowitz and Leydesdorff (2000) and Viale and Etzkowitz (2010), emphasizes the central role of universities and claims that knowledge now is produced in the context of different organizational configurations marked by the overlapping institutional spheres of education, businesses and government. This overlap produces a trilateral network (sector 4 in Figure 1) and bilateral networks (sectors 1, 2 and 3 in Figure 1), sometimes temporarily, that bring together higher education and the business sector, often encouraged by the financial support of the government.



Source: The authors, adapted from Etzkowitz and Leydesdorff (1997).

Figure 1: The Triple Helix model

The Triple Helix model is used for analysis in many settings, often linked to how it stimulates innovation systems, Bercovitz and Feldman (2006). There are also articles focusing on the Triple Helix and creative industries, like Solesvik (2017). Two discussions have come up in recent years that are of relevance and interest for our case. The first questions if the Triple Helix model needs to be extended with a fourth circle that represents organizations outside the government sphere that contribute to financing and commercialization. Colapinto and Porlezza (2012) and Parveen, Senin and Umar (2015) argue that this extension to a "Quadruple Helix" model is important to better explain innovative activities, especially within the open innovation paradigm. We have seen arguments for a "Fourth Helix" concept, Carayannis and Campbell (2006) where creative industries, arts, and arts taught in universities represents a precondition for a successful functioning of the original Triple Helix model. This argument must be seen in connection with the development of the knowledge economy, Westeren (2012), and how knowledge contributes to competitiveness. This argument is certainly of interest but whether this means that some aspects of the Triple Helix model are more important than others, or that it is necessary to reform the Triple Helix model remains to be seen.

We have designed the questionnaire to highlight aspects of the Triple Helix model. This is done within the framework of all three research questions. The Triple Helix model focuses on the advantages of cooperation between business, higher education and government and a successful collaborative model strengthens the arguments of a well-functioning Triple Helix model. It is also interesting to determine if there are conflicting interests between the participating groups we analyse and see what can be done to remove conflicts so the Triple Helix Model can function better. We have a multitude of definitions of knowledge transfer, but one that is often is used as a start comes from Argote and Ingram (2000, p 151) "Knowledge transfer in organizations is the process through which one unit (e.g., group, department, or division) is affected by the experience of another." This definition emphasizes the dynamic aspects of the transfer of knowledge and links it to organizational learning. For our analysis it is important to put the individual aspect more clearly into account and then the definition by Duan, Nie and Coakes (2010) works better. First, they refer to the definition by Argote and Ingram (2000), cited above, then they refine, stating that knowledge transfer is defined as a process by which "Knowledge is exchanged between or among individuals, teams, groups, or organizations." Duan et al (2010, p 359).

Spraggon and Bodolica (2012) suggest that the literature about successes and failures of knowledge transfers can be divided into three groups:

- 1. The central role of the spiral model of knowledge conversion in knowledge transfer processes
- 2. Communication/ICT/media richness capacities of various processes that lead to the achievement of effective knowledge transfers

- 3. Intra-firm knowledge transfer barriers and enablers

The first point about knowledge conversion refers to the SECI model by Nonaka and Takeuchi (1995) and Nonaka, Toyama and Konno (2000). SECI is based on a metaphor where different knowledge processes follow each other and are put on top of each other in a spiral movement. At the heart of the conversion logic the model goes from:

1. Socialization: tacit – tacit knowledge
2. Externalization: tacit – explicit knowledge
3. Combination: explicit – explicit knowledge
4. Internalization: explicit – tacit knowledge

There has been serious criticism about the use of the tacit knowledge concept by Nonaka and Takeuchi, see e. g. Gourlay (2004; 2006) and Tsoukas (2005). Nonaka and Takeuchi (1995) say they build on Polanyi's concept of tacit knowledge (more correctly termed tacit knowing or the tacit component) and add elements from Japanese philosophy to their understanding of Polanyi. This raises the question about how clearly defined and understood Nonaka's tacit knowledge concept is. Most sceptics agree that Nonaka is not completely in line with Polanyi (1958). In the analysis in this article we put emphasis on the tacit – explicit knowledge transfer process and try to link this as closely to Polanyi as possible, then the division between focal and subsidiary awareness becomes essential. The other comment about the SECI model is that it is used in such a way that the spiral movement seems continuous without interruptions or barriers. This is normally not the general case, see e.g. Westeren (2012), and certainly not the case in creative industries where production often is organized in projects.

It is also of fundamental interest to have scientific analysis of the optimal process by which skills are given to students looking for a career in creative industries. There are some studies in this field like Dooley and Sexton-Finck (2017), Kerrigan and Aquilia (2013), Sabal (2009) and Yeates, McVeigh and Van Hemert (2011). The study by Dooley and Sexton-Finck (2017) raises the question how motion picture editors approach the subject of collaboration and teamwork to develop students' skills. The study investigates the degree to which explicit teaching in class can promote students' collaboration skills or if it is necessary for the students to participate in production activities as a part of learning process. The setup of their study differs from ours in that they look at students' behaviour during a production sequence with the interesting result that an increasing number of students "describe themselves as being 'open to giving and receiving feedback'", Dooley and Sexton-Finck (2017, p. 83). The interpretation of this is that the contact with the industry emphasizes the necessity of collaboration but the study gives no thoughts as to whether this improves the students' skills.

3. Data collection and analysis

3.1 Data collection

The data collection is based on a Questback survey to students and professors at Nord University and to industry professionals in Trøndelag County, Norway in February 2019. A total of 227 invitations were sent and 188 responses were returned, for a response rate of 82,8% which is high compared to similar research. More detailed information about the participants and the study program for the students is found in Tables 1 and 2.

Table 1: Participants in the survey.

	Frequency	**Percent**
Student	159	84,6
Professor	11	5,9
Industry pro	18	9,6
Total	188	100,0

Source: Own data collection.

Table 2: Study program for the students in the survey.

Study program for the students	**Frequency**	**Percent**
Film and Television	37	23,3
Digital Art/Animation	60	37,7
Game Design and Technology	62	39,0
Total	159	100,0

Source: Own data collection.

The main part of the data collection involved the respondents giving their opinions to 25 statements using a 7-point Likert scale, where the corresponding numeric values are 1: Strongly disagree, 2: Disagree, 3: Partly disagree, 4: Neutral, 5: Partly agree, 6: Agree, 7: Strongly agree.

3.2 Discussion of results

In the discussion of the results we will group selected statements according to the research questions. The first research question is about the collaborative model and here we base our discussion on the results from statements 29, 9 and 12. Statement 29 asks the question if "The creative industries have the optimal level of cooperation with universities to aid today's creative course programs." The average scores for students are 3,60, and for professors and Industry pros 2,36 and 2,83 respectively. This indicates that all groups disagree with the statement, but we have taken a closer look to determine if the differences between the groups differ significantly by using SPSS for an Independent Samples Test including Levene's Test for Equality of Variances and a t-test for Equality of Means. The results are in Table 4 and show that there is a significant difference between students (G1) and the professors (G2), and between the students (G1) and the Industry pros (G3). There is no significant difference between professors and Industry pros which means that both groups are strongly not satisfied with the situation. The students do not consider the situation as problematic as the other two groups do, but with the value 3,60, they also find the situation not satisfactory.

When we ask for the need for collaboration in statement 9: "During their studies, the students must get input from the creative industries to understand the requirements of the creative industries", the scores are very high (average 6,32 for the total) and very equal for all groups. The next item is about relevance and in statement 12 we ask if "The university profile of the creative arts curriculum is intentionally directed to make the students understand the needs of the creative industries". The average scores for students and professors are 4,85 and 4,82 respectively, and 4,50 from the Industry pros. This is within reasonable limits of what we could expect and it is not necessary here to show t-test results because no group mean differs significantly.

RQ2 is about possible conflicting interests between the groups and here we look at statements 14 and 17. Statement 14 asks if theoretical subjects in class reduce the creative potential of the students in university/industry cooperation projects. This is an important question because one of the main expectations from industry pros is that education should develop and stimulate creativeness in the students. The statement is negatively formulated so a denial of the statement is preferable. The numerical results of the means are shown in Table 3 and indicate a denial from the professors, mean value 2,91. Students and industry pros are in the middle of the scale with mean values 4,18 and 3,94 respectively. The interesting question here is if the results differ significantly and the t-test values are in Table 4. When we look at the students (G1) and test versus the professors (G2), we find a significant difference of means indicating that the students believe more than the professors that theoretical subjects reduce creativity. We find the same significant results when we test industry pros versus professors but no significant difference in opinion between students and industry pros. The gap between the professors and the two other groups is a challenge where the professors need to put in more effort by strengthening the link between creativeness and formal education. Table 4 also show the results from Levene's Test for Equality of Variances and we cannot assume equal variances for the test of G1 vs G2 while the hypothesis of equal variances is not rejected for G2 vs G3. This does not influence any of the conclusions because the significance level holds for both alternatives.

Universities have experienced increased demands from national authorities to focus on formalized research and this is believed to have negative consequences for subjects intended more for creative industries than education in general. In this project these questions are looked at in statements 17: "Academically-based theoretical knowledge is looked at as more important than industry-based practical knowledge in the university education". The students have a mean score on this issue of 4,19 which is close to neutral, leaning towards agreement. Also, surprisingly, most of the Industry pros are neutral, with some leaning toward agreement giving a mean score of 4,72. Not surprising is the professors' unilateral acknowledgment that theoretical knowledge is seen as more prized with a score of 5,36. Probably the professors are the only ones who know the perceived university model, but clearly there is a lack of understanding about the model from the students. The independent samples analysis shows a significant difference between students and professors but no significant differences between other groups.

The issue of knowledge transfers is included in several of the statements, and here we choose to focus on statements 11: "Students with no prior creative industry exposure are not able to grasp the concepts taught by industry professionals", 21: "Practical instruction from industry professionals does not lend a better real-world view compared to theory", and 32: "Knowledge transfers from professional to student are essential to maintaining the health of the industry". The answers on statement 11 show that this is an interesting topic, as students seem relatively certain that they have the capacity to absorb the knowledge, yet both the professors and the Industry pros are not so sure of that. It is also interesting to note that there is still some neutrality for both students and professors, signalling some uncertainty. The group means are so close here that it is not necessary to show the t-tests because there are no significant differences.

Concerning statement 21, a large majority of all respondents, across all 3 sectors, respond negatively to this statement showing that knowledge transfers from Industry pros are indeed necessary for a satisfactory view of the industry landscape. It is interesting to notice that the strongest views (lowest value of the mean) on this come from the professors, underlining the industry views as a complement to their own teaching. The t-tests show no significant differences between any group. Statement 32: "Knowledge transfers from professional to student are essential to maintaining the health of the industry" is a quite general statement about knowledge transfers and the answers result in unanimous agreement. The differences between the groups are small and Table 4 show the t-tests giving no significant differences between any group.

4. Conclusions and suggestions for further research

In accordance with the Triple Helix model all sectors seem to be in general agreement about the need for substantial cooperation and collaboration between academia, government, and Creative Industry for the benefit of the students and the continuing health of the creative industries. The first research question challenges if this is done in an optimal way and what kind of improvements are necessary and possible. Development of creativity is the fundament for further collaboration based on a Triple Helix logic and here our results show that there is still a job to be done. The Creative Industries and universities know that you cannot teach creativity in the same way as you teach engineers to maintain routines in a production unit. Creativity is often about developing skills together with a potential that unfolds in a specific context, and at the same time as the initiatives are created, the person must have the capacity to communicate them. The answers from the students in several statements, displayed in Table 3, show clearly that not everything is optimal.

The second research question about conflicting interests between the university, students, and the creative industry does not reveal contradictions as problematic as we could expect. There are quite univocal results of the necessity of creative industry participation in university programs and that this should be increased rather than reduced. Statement 14 shows that there is a need to develop the creative potential of the students, yet the professors would argue that a sound theoretical foundation is also required. This leads to the third research question about knowledge transfers. Here our interpretation is that the students are indeed able to comprehend the knowledge taught, and the problem for the students seems more to be able to enhance the tacit component of the knowledge in the collaboration with industry. This is in line with some of the results about knowledge transfers and tacit knowledge in the literature section, see also Westeren (2018).

As mentioned in the literature review, many studies look at students in a study situation or training situation in their quest for a career in creative industries. The results mostly conclude that the collaborative model functions and transfers of knowledge function reasonably well. This study adds to the referred scientific literature that professors and industry pros seem to be more critical than the students about the functioning of the collaborative model between the groups. Earlier research like Dooley and Sexton-Finck (2017) relies mainly on student evaluations. The discussion about academia not being able to contribute to creativeness as much as it should has been a topic for many years, see Munro (2016), Comunian (2017), Lam (2018) and Hauge et al (2018) and the general perception is that there should be improvements. This study suggests actual ways to improve like focusing more on industry needs.

This field certainly needs more research, especially because of the challenges involved in investigating the field of creativity itself. Creativity is important because of its unique role in society and business, yet as a research object, due to its non-empirical nature, it is somewhat problematic with continually changing values leading to difficulties in formulating, evaluating, and interpreting the outcomes.

Table 3: Results from the data collection

Respondent affiliation		8: The students are attending university to prepare themselves especially for work in the creative industries.	9: During their studies, the students must get input from the creative industries to understand the requirements of the creative industries.	10: Theoretical knowledge can be lost if there is too much collaboration with industry.	11: Students with no prior creative industry exposure are not able to grasp the concepts taught by industry professionals.	12: The university profile of the curriculum is intentionally directed to make the students understand the needs of the creative industries.	13: Universities should provide about 50% division of practical instruction compared to theoretical.	14: Theoretical subjects in class reduce the creative potential of the students in university/industry cooperation projects.	15: Universities need the help of employees from the creative industries to participate in class to properly instruct creative arts students.
Student	N	158	157	159	159	158	159	158	159
	Mean	6,10	6,27	3,14	3,30	4,85	4,62	4,18	5,77
Professor	N	11	11	11	11	11	11	11	11
	Mean	6,27	6,64	3,73	3,82	4,82	4,91	2,91	5,45
Industry pro	N	18	18	18	18	18	18	18	18
	Mean	5,11	6,50	2,11	3,72	4,50	5,67	3,94	6,22
Total	N	187	186	188	188	187	188	187	188
	Mean	6,02	6,32	3,07	3,37	4,81	4,74	4,09	5,80

Table 3: Continuing

Respondent affiliation		16: Universities do not have technical equipment on a professional level to transfer relevant knowledge to creative industries.	17: Academically-based theoretical knowledge is looked at as more important than industry-based practical knowledge in the university education.	18: It is a clear strategy of the university that student shall be able to get a job in the creative industries after finishing education.	19: It is appropriate that universities are strict concerning the academic credentials needed when hiring professors.	20: Universities should remain solely academic in nature.	21: Practical instruction from industry professionals does not lend a better real-world view compared to theory.	29: The creative industries have the optimal level of cooperation with universities to aid today's creative course programs.	32: Knowledge transfers from professional to student are essential to maintaining the health of the industry.
Student	N	159	159	159	158	158	159	159	159
	Mean	4,07	4,19	4,97	3,73	2,68	2,18	3,60	6,10
Professor	N	11	11	11	11	11	10	11	11
	Mean	3,45	5,36	3,82	3,82	1,82	1,80	2,36	5,82
Industry pro	N	18	18	18	18	18	18	18	18
	Mean	4,06	4,72	4,33	2,83	2,39	2,22	2,83	6,28
Total	N	188	188	188	187	187	187	188	188
	Mean	4,03	4,31	4,84	3,65	2,60	2,16	3,46	6,10

Source: Own data collection

Table 4: Independent samples tests for selected statements

		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.
Q 14	Equal var. ass.	8,071	0,005	2,456	167	0,015	1,274
G1 vs G2	Equal var. not ass.			3,462	13,308	0,004	1,274
Q 14	Equal var. ass.	4,813	0,030	0,580	174	0,563	0,239
G1 vs G3	Equal var. not ass.			0,712	24,045	0,483	0,239
Q 14	Equal var. ass.	0,825	0,372	-2,173	27	0,039	-1,035
G2 vs G3	Equal var. not ass.			-2,249	23,599	0,034	-1,035

		Levene's Test for Equality of Variances		t-test for Equality of Means			
Q 17	Equal var. ass.	3,174	0,077	-2,209	168	0,029	-1,175
G1 vs G2	Equal var. not ass.			-2,856	12,644	0,014	-1,175
Q 17	Equal var. ass.	2,335	0,128	-1,269	175	0,206	-0,534
G1 vs G3	Equal var. not ass.			-1,616	24,707	0,119	-0,534
Q 17	Equal var. ass.	0,379	0,543	1,311	27	0,201	0,641
G2 vs G3	Equal var. not ass.			1,308	21,125	0,205	0,641
Q 29	Equal var. ass.	1,530	0,218	2,916	168	0,004	1,240
G1 vs G2	Equal var. not ass.			3,494	12,196	0,004	1,240
Q 29	Equal var. ass.	1,832	0,178	2,296	175	0,023	0,770
G1 vs G3	Equal var. not ass.			2,863	24,278	0,009	0,770
Q29	Equal var. ass.	0,036	0,851	-1,145	27	0,262	-0,470
G2 vs G3	Equal var. not ass.			-1,124	20,091	0,274	-0,470
Q 32	Equal var. ass.	6,806	0,010	0,928	168	0,355	0,282
G1 vs G2	Equal var. not ass.			0,507	10,332	0,623	0,282
Q 32	Equal var. ass.	0,679	0,411	-0,808	175	0,420	-0,177
G1 vs G3	Equal var. not ass.			-0,928	22,819	0,363	-0,177
Q 32	Equal var. ass.	3,557	0,070	-0,949	27	0,351	-0,460
G2 vs G3	Equal var. not ass.			-0,791	12,085	0,444	-0,460

Source: Calculations using SPSS v25, based on own data collection.

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