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Interdisciplinary Glocal Service Learning – Enhancement of Students' Interdisciplinary Competence, Self-Awareness and Glocal Civic Activism

Abstract

Today we live in an increasingly interconnected and global world. There is an urgent need to solve global issues. Therefore, civic education ought to go beyond local community service. "Interdisciplinary glocal service-learning" is a novel combination of different teaching-learning methods such as service-learning, glocal learning, interdisciplinary learning, and education for a sustainable development. A pre-test - posttest study was conducted on a sample of 86 students participating in an interdisciplinary glocal service-learning course with a cohort of 140 students participating in traditional monodisciplinary courses at the same level in different departments (including Psychology, Economics, Education, and Geography students). As expected, students' development of interdisciplinary competence, self-awareness, and glocal civic activism was higher in interdisciplinary glocal service-learning.

Keywords

Interdisciplinary Glocal Service Learning, Interdisciplinary Competence, Self-Awareness, Glocal Civic Activism, Sustainability

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1 Introduction

In line with the concept of civic engagement of higher education institutions, service-learning aims at supporting students to become active citizens in society (JACOBY, 2009). Due to an increasingly interconnected and global world, civic education ought to go beyond local community service so that students can become a global citizens and are able to connect the two concepts of 'local' and 'global', defined as the glocal approach (BATTISTONI, LONGO & JAYANANDHAN, 2009; JACOBY, 2009). Moreover, since local and global issues are too complex to be addressed and solved within one discipline, there is a pressing need for an interdisciplinary approach in service-learning (BARTH, ADOßMENT, FISCHER, RICHTER & RIECKMANN, 2013; LUCAS, 2009; SCHMIDT, 2008). Complex issues within the concept of sustainability such as climate change, global inequality, unsustainable consumption, and production (UN, 2015) represent a suitable framework to connect service learning, glocal learning, and interdisciplinary learning. This study introduces the teaching-learning arrangement of "Interdisciplinary glocal service-learning", which students are engaged in local communities that address issues regarding sustainability (sustainability framework) aiming towards a solution on global issues (glocal learning) with an interdisciplinary approach (interdisciplinary learning). This study also explores the effectiveness of interdisciplinary glocal service-learning by investigating students' development in interdisciplinary competence, self-awareness, and glocal civic activism.

2 Theoretical and empirical Framework

2.1 From Service Learning to Glocal Service Learning with Sustainability as an integrating Framework

Service learning is a teaching-learning arrangement in which students "engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development"

(JACOBY, 1996, p.5). Service learning pedagogy is highly influenced by the theory and philosophy of John Dewey, who advocated experiential education as a means of fostering civic participation and the greater good (HARKAVY & HARTLEY, 2010). Experiential learning theory (ELT) by KOLB (1984) proposed a model of experiential learning that focuses on experience, activity, and reflection. Therefore, learning becomes knowledge through experience. Empirical studies have shown that service-learning has positive effects on critical thinking (ASTIN, VOGELSANG, IKEDA ET AL., 2000), problem solving skills (GOVEKAR & RISHI, 2007), civic attitudes (GERHOLZ, LISTZ & KLINGSIECK, 2017; GOVEKAR & RISHI, 2007), and the willingness to be engaged (PRENTICE & ROBINSON, 2010). Moreover, YORIO and YE (2012) found in their meta-analysis that service-learning enhances students' understanding of social issues (e.g. understanding the needs of the community, how to help, a desire to engage in future service activities), personal insight (e.g. awareness of oneself in terms of strengths and weaknesses, self-efficacy), and cognitive development (management skills, problem-solving skills, critical thinking skills).

Following the ideas of Dewey, service-learning should be embedded as educational experiences within local contexts, relationships, and community institutions. However, 21st century education is taking place in an increasingly interconnected, global world, which has an impact on the community life (BATTISTONI, LONGO & JAYANANDHAN, 2009) and decisions in one locale can affect the lives of people in distant communities. In civic education one needs to connect global themes with local action (MCKINNON, TOMS SMEDLEY & EVERT, 2016). Consequently, service-learning educators need to ask themselves how to include the exploration and enactment of practices not only at the local level but aiming for these practices with a global framework (BATTISTONI, LONGO & JAYANANDHAN, 2009). This question is addressed by the concept of glocalized learning and teaching that defined as a "curricula consideration and pedagogical framing of local and global community connectedness in relation to social responsibility, justice, and sustainability" (PATEL & LYNCH, 2013, p. 223). Combining service learning with glocalized learning, enables educators to address global issues in a local service-learning

teaching-learning arrangement. While students are active in local communities they may acquire deeper understanding of global interconnectedness and simultaneously become better global practitioners. Service-learning approaches that combine local and global perspectives were found to enhance civic engagement (EDMONDS, 2012), self-efficacy, and a globalized perspective (HARTMAN, KIELY, FRIE-DRICHS & BOETTCHER, 2013).

Since education for sustainable development acknowledges both real-life problems and experiences, it helps to develop capacities for enacting change (BARTH, ADOßMENT, FISCHER, RICHTER & RIECKMANN, 2013) present an ideal framework for glocal service-learning. Service-learning approaches to education for sustainable development were reported to increase civic engagement, leadership skills, self-confidence, and students' feelings to be able to make a difference for the community (SUTHEIMER & PYLES, 2011; VARTY, LISHAWA & TUCHMAN, 2011).

2.2   From Glocal Service Learning to interdisciplinary Glocal Service Learning

Local issues addressed by service-learning arrangements in local communities (LUCAS, 2009) and issues regarding sustainability on a local and global level (BARTH, ADOßMENT, FISCHER, RICHTER & RIECKMANN, 2013; SCHMIDT, 2008) are extremely complex that cannot be solved within one discipline.Therefore, glocal service-learning projects should be approached by making use of interdisciplinary methodology. Interdisciplinary learning is defined as a process by which "learners integrate information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines to craft products, explain phenomena, or solve problems, in ways that would have been unlikely through single-disciplinary means" (BOIX MANSILLA, 2010, p. 289). More precisely, each step of an interdisciplinary teaching-learning arrangement allows and facilitates integration of different disciplines. In monodisciplinary learning, students remain to work and learn within their disciplinary tradition. In multidiscipli-

nary learning, students tackle the same problem or theme as other disciplines but still remain within discipline based boundaries regarding methods, tools, perspectives etc. In contrast, interdisciplinary learning enables students to connect, synthesize, and integrate discipline-based information to create new knowledge. GER-HOLZ, LISTZ and KLINGSIECK (2017) explained service-learning is a parallel process that consists of service process and learning process. In order to implement interdisciplinary in the service learning arrangement it requires both service process and learning process to be interdisciplinary. Within interdisciplinary service process, students are required to define the problem across all disciplines and interdisciplinary working process should be integrated in the problem. This leads to an interdisciplinary solution or product that could not have been created by just one discipline. Within interdisciplinary learning process, students should be interested in solving problems with students from other disciplines by exploring content, methods, and theories to successfully integrate information across disciplines as well as reflecting on their interdisciplinary learning.

Interdisciplinary learning is rooted in the constructivist philosophy of Dewey (DOLE, BLOOM & KOWALSKE, 2016). Humans as learner perceive the world, interpret activities, and construct knowledge through questions, tests, and answers in an iterative process. Interdisciplinary learning allows students to reconstruct knowledge by reproducing constructions of other disciplines, to construct new knowledge by innovatively integrating content across all disciplines and to deconstruct knowledge by discovering limitations of one's own discipline.

By combining interdisciplinary learning and service-learning would benefit students and community in such a way that students learn to integrate knowledge gained from various disciplines as a result would be helpful in preparing for future labor (WIESE & SHERMAN, 2011). As for the community, it would gain holistic solutions to address problems that single discipline cannot produce on their own (LUCAS, 2009). Interdisciplinary service-learning has been successfully implemented in a combination of several disciplines including Social Work (GERSTENBLATT & GILBERT, 2014), Health Professions (GUPTA, 2006), Environmental Studies (SIMON ET AL., 2013), Sociology, Social Work (ROOKS &

WINKLER, 2012), Marketing (WIESE & SHERMAN, 2011), and Rehabilitation Sciences (PECHAK, GONZALEZ, SUMMERS & CAPSHAW, 2013). Research on interdisciplinary service-learning reported positive effects on students' understanding and appreciation of each other's profession (FLINN, KLOOS, TEAFORD, CLARK & SZUCKS, 2009). Qualitative research indicated an enhancement of students' ability to identify and discuss the similarities and differences in professional thinking, training, language, practice, ability to gain holistic solutions, communication skills (GUPTA, 2006), students' ability to value collaboration, importance of communication, sense of empowerment, accomplishment, and self-discovery (PECHAK, GONZALEZ, SUMMERS & CAPSHAW, 2013). So far, research has not investigated on the combination of interdisciplinary and glocal service learning. Interdisciplinary glocal service-learning with sustainability as a framework, gives students the opportunity to identify interdisciplinary approaches to complex issues regarding sustainability within their local community aiming towards a global effect.

The following study focuses on the effectiveness of interdisciplinary glocal service learning regarding three constructs that address different elements of the teaching-learning arrangement. First, when implementing interdisciplinary learning we expect a positive effect on *interdisciplinary competence. Interdisciplinary competen*ce refers to the understanding of different disciplinary knowledge, methods, expectations, and boundaries (LATTUCCA, KNIGHT & BERGOM, 2013). Furthermore, it refers to the ability to think about different disciplinary perspectives, to use different disciplinary perspectives in solving interdisciplinary problems by making connections, to synthesize and integrate knowledge across academic fields, and the ability to recognize the need to reconsider the direction of one's thinking and problem solving approaches. Second, due to the implementation of glocal learning, we expect a positive effect on *self-awareness* and *glocal civic activism*. *Self-awareness* refers to students' recognition of their own limitations and ability to engage successfully in an intercultural encounter (MORAIS & ODGEN, 2010). *Glocal civic activism* refers to students' engagement in purposeful local behaviors that advance global agendas (MORAIS & ODGEN, 2010).

3 Research context and methodology

3.1 Context

The context of the study was an interdisciplinary glocal service-learning that consisted of a twelve-credit course (winter term of the academic year 2015/16) at a bachelor-level within a cross-faculty cooperation of educators from the department of Psychology, Economics, Education, and Geography at the University of Hamburg, Germany.

Overall, there were ten groups with 86 students in the interdisciplinary glocal service learning course. The average age was 24.6 years ($SD = 5.5$) and the majority were female students (55.8%). Within the interdisciplinary glocal service-learning course all 10 interdisciplinary student teams underwent five steps that are listed in table 1). The conceptualization of the course was constructed on the didactical elements proposed by GODFREY, ILLES and BERRY (2005) (The 3 Rs: Reality, Reflection, and Reciprocity) and KOLBs (1984) learning cycle (Reflective observation, abstract conceptualization, active experimentation, and concrete experience). Each interdisciplinary team chose a sustainability problem as a focus, for example, refugee crisis, plastic consumption, post growth, sustainable consumption to recycling with community partners like refugee accommodation facilities, food-sharing initiative, urban gardening station, a plastic-free store, and a waste separation initiative in Hamburg. In every step the students were assigned to integrate knowledge from all disciplines involved. They were graded on their interdisciplinary scientific papers and their interdisciplinary videos.

Following the up-to-date service-learning research guidelines (DAHAN, 2016), we included a counterfactual with a control group. The cohort consisted of 140 students who participated in traditional courses in either Psychology, Economics, Education, or Geography were at the same level as the students participated in the interdisciplinary service-learning course. The average age of this cohort was 27.7 years ($SD = 7.5$) and 52.8 % were female. Each educator of the monodisciplinary courses chose a content that was unrelated to the theme sustainability and glob-

al/local dependencies. Monodisciplinary basics in each discipline are covered by monodisciplinary courses. The exams were composed of an oral presentation and a written scientific paper.

Table 1: Conceptualization of the interdisciplinary Glocal Service Learning Course „Sustainable Futures"

	Course sessions	Kolbs Learning Cycle	Activating the 3Rs
1	**Identification of a 'sustainability' problem** (1) Reading newspaper articles; (2) identification of interdisciplinary problem regarding sustainability (3) multidisciplinary brainstorming of theories, findings and methods (4) interdisciplinary definition of learning goals (5) interdisciplinary research (6) writing of paper with interdisciplinary solution approaches	Reflective observation (newspaper articles) ⇩	Reality How can your discipline contribute to interdisciplinary real world problems? Reflection How did the interdisciplinary team work the sustainability problem change your view on 1. your discipline, 2. sustainability, 3. interdisciplinarity, 4. local-global challenges, 5. the possibilities of science?
2	**Presentation of scientific paper with interdisciplinary solution approaches** (1) Presentation of chosen interdisciplinary sustainability problem & solution approaches	Abstract conceptualization (scientific solution approaches)	Reflection How did the presentation and feedback form other students change your view on 1.-5.?

(2) Student peer feedback	⇩	
3 Contacting community partner (1) Searching for a potential community partner (2) Presentation of interdisciplinary ideas to community partner (3) Identification of community partners needs (4) Commonly identifying interdisciplinary solution strategies for application	Active experimentation (brainstorming with community partner) ⇩	Reality How can your discipline contribute to the interdisciplinary problems of your community partner? Reflection How did the contact to your community partner change your view on 1.-5.? Reciprocity How does the community partner profit from your work, and vice versa?
4 Work with community partner (1) Implementing interdisciplinary solution strategies (2) Reflection with community partner	Concrete experience (implementation of ideas) ⇩ Reflective observations (watching results)	Reality How can your discipline contribute to the interdisciplinary problems of your community partner? Reflection How did the cooperation with your community partner change your view on 1.-5.? Reciprocity How does the community partner profit from your work, and vice versa?

Scientific Contribution

5 **Production of a 'lessons learned' video**		Reality
(1) Identification of transfer strategies for other communities	⇩	How can your discipline contribute to interdisciplinary real world problems?
(2) Development of a story board	Abstract conceptualization	Reflection
(3) Shooting, cutting of video	(knowledge transfer development)	How did the video production change your view on 1.-5.?
(4) Publishing of video as open content in a blog		

3.2 Methodology

Using a two group pre-test post-test design, the students were asked to complete the questionnaire at the beginning (t1) and at the end (t2) of the interdisciplinary glocal service-learning course. The same questionnaires and t's were applied to all control group settings. The questionnaire included items regarding the students' interdisciplinary competence (LATTUCCA, KNIGHT & BERGOM, 2013; 10 items; example: "I can use what I have learned in one field in another setting."), self-awareness (MORAIS & ODGEN, 2010; four items; example: "I know several ways in which I can make a difference on some of this world's most worrisome problems."), and glocal civic activism (MORAIS & ODGEN, 2010; three items; example: "If at all possible, I will always buy fair-trade or locally grown products and brands."). Following the translation and adaption guidelines by HAMBLETON and DE JONG (2003), all items regarding interdisciplinary competence, self-awareness, and glocal civic activism were translated into German then back to English. The three native English speakers did approve of the original and backward translation on literal and contextual equivalence with satisfying results (each surpassing 80% in assessing accuracy). Each of the variables was assessed on a six-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Each construct had an acceptable internal consistency (interdisciplinary competence: $\alpha t1 = 0.82$,

αt2 = 0.86; self-awareness: αt1 = 0.66, αt2 = 0.76; global civic activism: αt1 = 0.76, αt2 = 0.83).

4   Results

The descriptive data regarding total mean scores and standard deviations of self-rated interdisciplinary competence, self-awareness, and glocal civic activism of the pre-test and post-test in both teaching-learning arrangements of interdisciplinary glocal service-learning and a traditional course in the same monodisciplinary co-hort are presented in table 2. The total mean scores indicated only a small increase in students' interdisciplinary competence and self-awareness and almost no change in glocal civic activism in the teaching-learning arrangement cohort. In contrast, the total mean scores in the teaching-learning arrangement of interdisciplinary glo-cal service-learning indicated students' severe increase in all variables

Table 2: Total Mean Scores and Standard Deviations Pre-test and Post-test by students participating in either Interdisciplinary glocal Service-Learning or in Cohort

	Interdisciplinary glocal Service-Learning ($n = 86$)				Cohort ($n = 140$)			
	Pre-test		Post-test		Pre-test		Post-test	
	M	SD	M	SD	M	SD	M	SD
Interdisciplinary Competence	3.56	0.60	4.02	0.64	3.31	0.68	3.44	0.75
Self-Awareness	2.64	0.88	3.44	0.79	2.53	0.75	2.77	0.86
Glocal Civic Activism	3.39	0.93	3.69	1.01	3.19	1.05	3.17	1.04

Three two-way ANOVAs with repeated measures on one factor were conducted to determine whether there was a statistical significance between two different types of teaching-learning arrangements. The independent variable included a between-subjects variable, the participation in either interdisciplinary glocal service learning or in regular courses within monodisciplinary curriculum, and within-subject variable, repeated measures of pretest and posttest. The dependent variable was either the self-rated intensity of interdisciplinary competence, self-awareness or glocal civic activism. An alpha level of .05 was utilized for this analysis.

There was a statistically significant interaction in self-rated intensity of interdisciplinary competence between the type of teaching-learning arrangement and the test time, $F (1, 224) =14.40$, $p < .001$, $\eta^2 =.07$, which was indicative of a moderate effect size. The result of main effect of pre-test and post-test was significant, $F (1, 224) = 47.08$, $p < .001$, $\eta^2 = .20$. A large effect size was evident. There was also a significant main effect in the type of teaching-learning arrangement, $F (1, 224) = 17.22$, $p < .001$, $\eta^2 = .08$, which was indicative of a moderate effect size. There was also a statistically significant interaction in a self-rated intensity of self-awareness between the type of teaching-learning arrangement and test time, $F (1, 224) = 24.67.$, $p < .001$, $\eta^2 =.11$, which was indicative of a moderate effect size. The result of main effect of pre-test and post-test was significant, $F (1, 224) = 73.65$, $p < .001$, $\eta^2 = .28$. A large effect size was evident. There was also a significant main effect in the type of teaching-learning arrangement, $F (1, 224) = 16.35$, $p < .001$, $\eta^2 = .08$, which was indicative of a moderate effect size. Again, there was a statistically significant interaction in self-rated intensity of glocal civic activism between the types of teaching-learning arrangement and test time, $F (1, 224) = 6.24$, $p < .05$, $\eta^2 =.03$, which was indicative of a small effect size. The result of main effect of pre-test and post-test was significant, $F (1, 224) = 4.70$, $p < .05$, $\eta^2 = .03$. A small effect size was evident. There was also a significant main effect in the type of teaching-learning arrangement, $F (1, 224) = 5.76$, $p < .05$, $\eta^2 = .03$, which was indicative of a small effect size.

In conclusion, the main results of each two-way ANOVA indicated a change in each of the variables. Students' self-rated intensity of interdisciplinary competence,

self-awareness, and glocal civic activism demonstrated changes over time. Most importantly, there is a difference in the types of teaching-learning arrangement, indicating a higher gain score in interdisciplinary glocal service-learning in students' interdisciplinary competence, self-awareness, and glocal civic activism.

5 Discussion

As demonstrated by the findings of the study, interdisciplinary glocal service-learning can have a positive effect on the development of interdisciplinary competence, self-awareness and glocal civic activism. These results are in line with experiential learning, constructivist philosophy (DOLE BLOOM & KOWALSKE, 2016; KOLB, 1984) and other investigations regarding individual elements of interdisciplinary glocal service-learning. An increase in interdisciplinary competence was also identified by BRASSLER and DETTMERS (2017) within the teaching-learning arrangement of interdisciplinary problem-based learning. Similarly, interdisciplinary service learning had positive effects on students' understanding of others' professions, the ability to identify and discuss similarities and differences in professional thinking, and the ability to gain holistic solutions (FLINN ET AL., 2009; GUPTA, 2006). Self-awareness is in a form of knowing ones' strength and weaknesses has also been reported in traditional service-learning (YORIO & YE, 2012). However, gains in self-awareness in a global scene transcend this construct and therefore the results highlighted the effect of glocal within the service-learning arrangement. Similarly, glocal civic activism represents expansions of traditional findings in an increased willingness to be engaged within the local community after participating in traditional service-learning approaches (EDMONDS, 2012; PRENTICE & ROBINSON, 2010; YORIO & YE, 2012).

There are several limitations in this study. First, the study was limited to its use of quasi-experimental design which could not control for group equivalence that posed a threat to the internal validity of the study. Also, the inclusion of a control group could not solve the self-selection bias (DAHAN, 2016). Nevertheless, YORIO and YE (2012) found no significant difference between quasi-experimental

and true experimental subgroups in the learning outcomes of service-learning. Second, this study did not use an objective measure to investigate cognitive development in regards to interdisciplinary competence, which could have induced socio-cognitive biases or inherent inadequacies in self-evaluations (YORIO & YE, 2012). Third, group effects could have occurred since students chose their own interdisciplinary glocal service-learning project, which has averted randomized matching of service projects (GERHOLZ, LISTZ & KLINGSIECK, 2017). Otherwise, student autonomy of this kind is highly recommended to enhance motivation (YORIO & YE, 2012). Fourth, teachers' characteristics and attitudes (HATTIE, 2008) as well as experience and expertise in interdisciplinary education could have an impact in student learning and may have distorted the results (SPELT, BIEMANS, TOBI, LUNNING & MULDER, 2009). Future research should investigate several interactive effects of pedagogical variations such as types of reflection (YORIO & YE, 2012), connectivity of local and global effects, amount and distance of different disciplines involved and differences in interdisciplinary applications.

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