

# Cross-border virtual teams, as seen from applied psychology & applied economy perspective. A Case study of a cross-cultural teaching program

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## Abstract:

*As communication becomes easier with the proliferation of ICT (Internet Communication Technology), more companies and individuals face the need and challenge of creating and facilitating virtual teams. Those are groups of people that contact each other only by the means of the internet, with no real-world physical face-to-face contact. Despite the numerous benefits, as low-to-non monetary costs and enormous creation flexibility, there are also many (psychological) risks, often not apparent from the outside. In the current paper we discuss the teaching program that was designed to foster virtual communication skills. We describe a project conducted simultaneously between Palacký University (Olomouc, CZ) and University of Opole (Opole, PL) in the summer term of 2015. We argue that such classes have a potential for individual and business development, provided the necessary preparations are made.*

## Keywords:

**Virtual Teams, Cross-Border Communication, Internet Communication, Human Resources**

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## **1. The concepts of social facilitation and social loafing**

Psychologists have devoted much attention to the construction and functioning of teams. One of the first experiments in psychology conducted by Norman Triplett at the end of the nineteenth century highlights the results of a comparison made between individual effectiveness versus group performance

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(Triplet 1898). Researchers compared the speed of turning a fishing wheel between the kids who were alone versus the kids working in a group. They found out that those who worked in a group tended to have better results. This effect is called social facilitation, and was confirmed and refined by many subsequent studies (e.g., Allport 1920; Zajonc 1980; Rafaeli, Rafaeli & Noy 2002). Yet this is not the only possible outcome of one's participation in a group. In fact, an increase in performance thanks to the presence of others occurs only when the task at hand is simple or well known by the conducting person (Zajonc 1980). In the case of the task being complicated or unfamiliar, a contradictory process will occur – people in teams will perform less well if compared with people doing the task on their own (Bond & Titus 1983).

There is yet another disruptor to the work in groups. This process was described by Ringelmann and is called social loafing (Ringelmann 1913). He observed people pulling a rope and was able to measure the contributing strength of each individual person. His results showed that the individual effort of each participant decreased with each additional person added to the group. This process was also confirmed in other studies where the lack of coordination could not account for the missing input (Williams, Harkins, & Latané 1981; Karau & Williams 1993). Social loafing may diminish the team's performance beyond the effects of simple lack of coordination. Both described effects - social facilitation and social loafing - are observable online (see Piezon & Ferree 2008; Thompson, Sebastianelli & Murray 2009), which is a firm indicator that they should play a role in virtual groups as well. It was therefore our aim to check which of the processes would play a bigger role – social facilitation or social loafing in real world *ad hoc* virtual teams.

## **2. Definition of a virtual team**

To properly describe virtual teams, we must define them in a specific context. The technological advancements continuously change the way team members interact and thus enable individuals who previously could not communicate with each other to work together. Such cooperation done by the means of internet technologies will enable the creation of a virtual team. The beginnings of virtualization of work date back to the 1980's, when e-mail started to be used at work. At the beginning of the twenty-first century virtual work started to spread and companies set up virtual teams (Johns & Gratton 2013). Even though the term a virtual team is widely used, it is not clearly defined. Generally, virtual teams are work arrangements where team members are geographically dispersed, have limited face-to-face contact, and work interdependently

using electronic communication media to achieve common goals (Dulebohn & Hoch 2017: 569). However, the work arrangements are continuously changing and evolving; thus it is highly unlikely that a broad consensus about the definition of a virtual team will be achieved. Cohen and Gibson (2003) state that geographic dispersion and technology are the two most consistently used dimensions in virtual team definitions.

Serrat suggests that nowadays we can distinguish eight basic types of virtual teams. These are:

1. Networked teams that collaborate for a common purpose with generally diffuse and fluid membership.
2. Parallel teams that boast distinct membership and work in the short term to carry out special assignments, tasks, or functions.
3. Project or product development teams that conduct non-routine tasks for customers or users over a defined period, with specific and measurable results, and wield decision-making authority.
4. Work, functional, or production teams that deliver regular, ongoing activities with clearly defined membership.
5. Service teams that take turns to meet customer or organizational needs with technical support around the clock.
6. Action teams that offer rapid responses, often in emergency situations.
7. Offshore information system development outsourcing teams that deliver portions of subcontracted work to an offshore independent service provider in conjunction with an onshore team.
8. Management teams that act collaboratively in an organization on a daily basis but are dispersed across a country or around the world. (Serrat 2017)

The teams in our project can be assigned to the 2nd and/or 3rd group as distinguished by Serrat. Regardless of the non-existence of one definition of a virtual team, it is apparent that thanks to available information and communication technologies most organizational teams nowadays can be considered virtual to some extent (Kirkman, Gibson & Kim 2012).

### **3. Virtual teams form an economic perspective**

The motivations to use virtual teams in organizations have also been evolving. The initial benefits of virtual teams at the beginning of the twenty-first

century were access to knowledge and cost savings. Virtual work made it possible for organizations to use the best knowledge with no regard to the geographical location of its bearer. It was also assumed that the use of virtual work can directly cut costs and that the virtual workers are highly productive. Another broadly discussed benefit of virtual work was the positive impact on environment thanks to reduced commuting of the workers (Kubátová 2011). Currently the use of virtual work by virtual teams is linked much more to the technological development, changing labor markets and work-related attitudes of young generations.

Now we are in the digital era with unprecedented information and communication technologies. These technologies create a ubiquitous working environment which enables various new ways of work (Bradley et al. 2015). However, we are quickly moving towards a new era, namely the AI (artificial intelligence) era (Makridakis 2017). With advancing AI technologies the labor market will change significantly. Already now more and more employers struggle to fill open jobs (Manpowergroup 2018). In 2018, 45% of employers around the world complained of talent shortage in the labor market. In Poland it was 51% of employers and in the Czech Republic it was 36%. This situation is going to be even worse as with the use of AI the demand in the labor market will continue to change. There will be a declining demand for workers in agriculture and in manufacturing but an increasing demand for highly skilled workers in services. However, jobs related to managing other people's work, to applying expertise, and to social skills will be still held by humans. Companies are recommended to use various strategies to staff such positions, for example by finding and using talent and cooperates beyond the organization.

Companies can build virtual teams whose members are dispersed literally around the world. This can be a great competitive advantage because the project completion time can be significantly shortened (Jimenez et al 2017). It is thanks to different time zones where the team members are located. The team members from Asia and Australia can work on a project, to pass it on their colleagues in Europe or Africa at the end of their business hours and the members from Europe or Africa can do the same with the colleagues from Americas. So the team is able to work on the project for 24 hours a day. Moreover, the cultural diversity can improve team effectiveness and have a positive impact on the team's ability to solve problems (Ng and Tung 1998). Diverse backgrounds of team members allow for tapping a wider range of information sources and networks (DiStefano & Maznevski 2000). Simultaneously the work-related attitudes of younger generations have been changing. Instead of traditional jobs, the bearers of human capital tend to choose independent work in an online (virtual) environment. When working for a

company, flexible working conditions including the possibility of virtual work is a common requirement of an employee (Kubátová 2016).

In view of the described economic and social developments, universities need to prepare their students for both sides of the current labor market – as workers or employees and as employers. With those changes in mind, we believe that a project about crossing borders – both in the sense of real to virtual world, and between countries – can help students find a better place in the labor market.

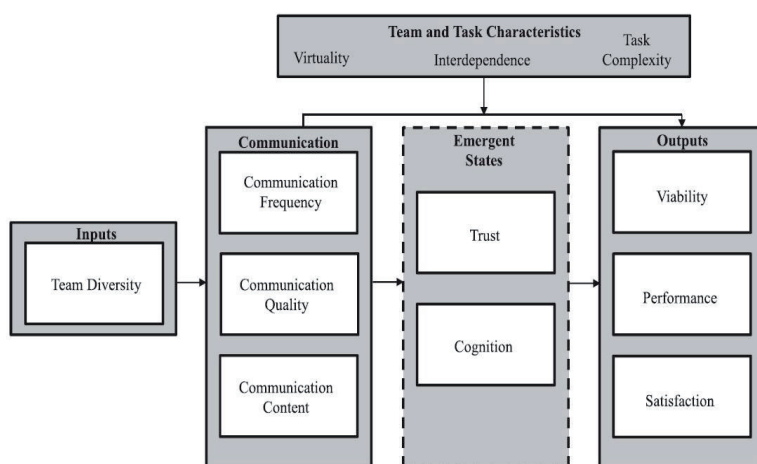
#### **4. Virtual teams from a psychological perspective**

In order to understand the psychological aspects of virtual teams, two important points of view have to be distinguished. First, it is the distinction between cohesion and performance (Kerr, Tindale 2004). Although it appears certain that groups need a certain level of cohesion to function well, too much focus on internal processes may hinder the functioning of the group. Thus groups need to establish themselves in the first place, to be able to coordinate their work. As far as the second aspect is concerned, to be able to evaluate group productivity, one needs to establish a baseline performance level (Steiner 1972). It is a level of performance which would be possible if the group worked under ideal conditions. Based on that, one can evaluate if the actual performance of the group reaches, or potentially exceeds, the baseline performance. The observable results show that in most cases groups underperform compared to the baseline set by the sum of individual performance (Steiner 1972; Kerr, Tindale 2004) which may be explained by the social loafing principle explained earlier. It is however not always the case, as the studies by Laughlin et al. show (Laughlin, Gonzalez & Sommer 2003).

The second important point is the structure of group process. The classical model presented by Steiner (Steiner 1972) constitutes of three aspects, labeled as input, process and output. Yet as Ilgen et al. suggest, groups are complex and dynamic systems, which need to function in different contexts (Ilgen, Hollenbeck, Johnson & Jundt 2005). Those contexts are defined by people, technology and environment, and may have a significant impact on the group effectiveness. Ilgen, Hollenbeck, Johnson and Jundt (2005) propose a input-mediator-output framework, where the specific context is (or can be) a decisive mediator in the effectiveness of group functioning. The fact that a group has both an international (cross-border) character and that it is virtual (online-only) constitutes a specific context, which is subsequently the basis of study design and discussion in the present paper.

## 5. Study design

The focus on people from different countries and technology indicates the need to use a more refined teamwork model, which could help to clarify the various aspects that appear in the specific functioning of virtual, cross-border teams. The framework for such teams is defined by Marlow et al. as a fit of the input-mediator-output framework (Marlow, Lacerenza, and Salas 2017). Specifically, Marlow et al. describe all the elements potentially influencing the functioning of virtual teams. Their model is presented in the following graph:



**Figure 1: Virtual Teams communication model.**

Source: Marlow, Lacerenza, and Salas 2017: 576. We have adapted this graph to specify our project. The adapted specification will be described in detail in the methods section, below.

### 5.1. Method

In order to evaluate the impact of cross-border environment on virtual team functioning, we organized a course for student volunteers, which ran in parallel at the Palacky University in Olomouc and the University of Opole, in the summer term of 2015. The course advertisement indicated the title (*Working in virtual teams*) and required the obligatory English language proficiency. We planned to utilize the prospective cultural diversity component constructing all the teams as a mixture of Polish and Czech students. The course was scheduled to include five moderated two-hour-long online sessions, with additional time and means for the students to work on their unique group's projects.

## 5.2. *Participants*

It turned out that the volunteers for the course were of two specialties only – applied economy on the Czech side, and psychology on the Polish side. Additionally, the number of students on the Polish side significantly outnumbered those on the Czech side (23:5), so we had to adapt our plans. In the end we decided to have two mixed groups (first group with two Czechs plus five Poles, and the other with three Czechs plus five Poles), and two single-nationality comparison groups (counting eight Poles and five Poles, respectively).

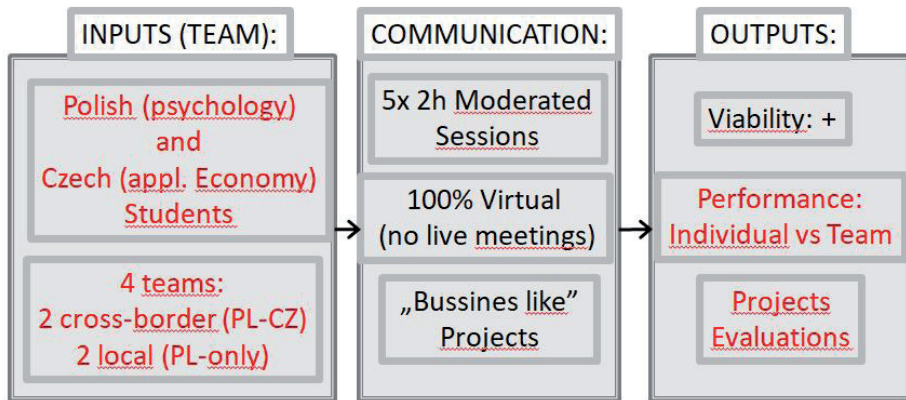
## 5.3. *Tools*

For the smooth running of the projects we utilized the following tools. As a base tool for file storage and online classes conduction we used capsa.cz, a system which can be used for free for a limited number of users (five at the time of writing), but which was extended due to a project granted to Palacký University, which allowed us to have more simultaneous participants. As an alternative source, we used google docs, which is free upon registration, and allows both for file storage and co-working. To organize virtual classes, we used WizIQ, which has an free trial period, but was also paid by Palacký University. We also tried various communication tools, to have an alternative to WiziQ. One of them was Skype, which had a limited number of simultaneous users at that time. This problem appears to be lifted now, however. As for the tasks (projects) the participants were recruited to conduct, these consisted in preparing a business plan for a company<sup>1</sup>, which they could start after graduation, and which would utilize their specific competencies, including the cross-border contacts they were building up during the project.

## 5.4. *Variables*

In order to clarify various aspects of the project, we adapted the model of Illgen et al. (Illgen, Hollenbeck, Johnson & Jundt 2005), which was subsequently improved on the basis of Marlow et al. (Marlow, Lacerenza, and Salas 2017). The adapted model is presented below.





**Figure 2: Model of our project, adapted from Marlow et al. (Marlow, Lacerenza, and Salas 2017: 576)**

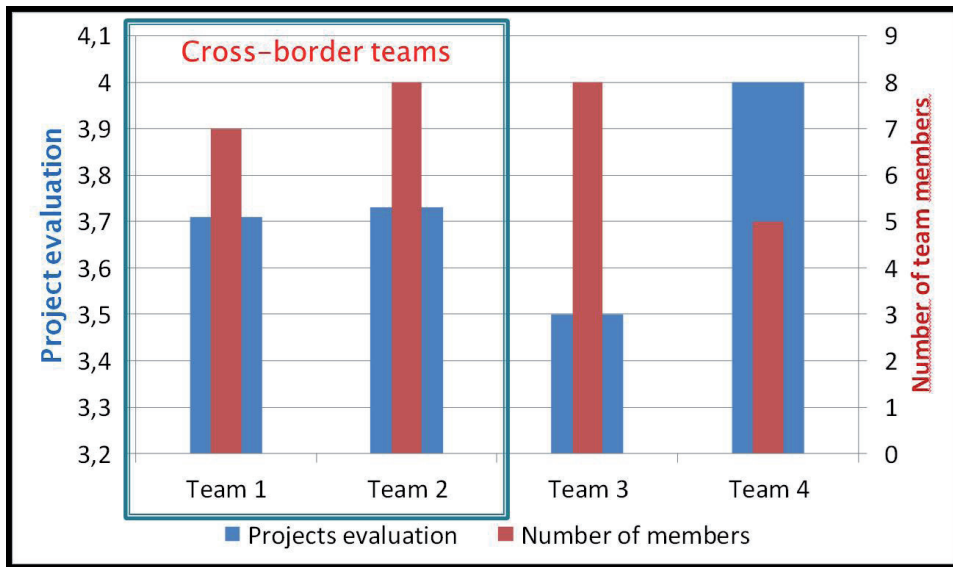
The inputs to the project have been described above in the participants section, and the communication variables in the tools section. The outputs were as follows. Under viability we understood the ability of the team to live longer than the duration of the project (classes) (Ilgen, Hollenbeck, Johnson & Jundt 2005). We did not evaluate the rate at which the projects turned to real businesses, but rather judged qualitatively, if they had a chance to survive on the market. Under those soft criteria all the created teams had a potential to develop into market functioning businesses. It is a matter of dispute and further studies why so few graduates end up not starting their own companies.

The other two output variables were the actual results of the projects, that is the project's overall quality (as judged by the people from the competing teams in the project), and the evaluation of the individual team members (as judged by other team members of the same team). For the overall project evaluation, each participant filled an anonymous google spreadsheets questionnaire where she or he had a chance to judge all other projects constructed during the course, on a 1 to 5 Likert-type scale, where 1 was described as "weak performance" and 5 as "the best performance ever". The individual performance of other team members was evaluated in a similar manner, but with a 1 to 7 scale, where the steps were labeled as follows: 1 – did not work at all, 2- did work very little, 3 – did some work, but not enough, 4 - did a moderate amount of work, 5 – did a large amount of work, 6 – did a significant amount of team's work, 7- was the most productive person in the team (available only for one person in the team).



## 6. Results

In the first stage, the results of the overall project evaluations were compared to the project composition. The results (mean project evaluations) are presented in the graph below.



**Figure 3: Projects evaluations as a factor of team composition and number of team members**

The results are not clear, as the cross-border team's effectiveness was in the middle of the project's evaluations ranking. Both the best and the worst project were made by single-nationality members. As for the other result variable – the individual input in the projects - due to a low number of responses (only one team rated their peers) we were unable to evaluate it strictly.

However, as course coordinators, we were able to observe both social facilitation – where people who were shy at first did improve their effectiveness when connected online with their peers, and social loafing – where some members within each group were giving less input when with others, as compared with their individual performance. Those effects were however fleeting, and because we have not gathered enough responses in the mutual member's evaluations (which were designed for this purpose), a precise evaluation of the degree of these effects is impossible as of yet.

## 7. Observations and recommendations

The project proved to be quite satisfactory for both the students and the moderators. Despite initial fears voiced by some of the participants, both the classes and the individual projects ran smoothly as regards work load and progress in time. Yet, despite what appeared initially as “clear instructions”, we could not avoid a few pitfalls. We will describe the most noticeable of them, starting from the technical ones.

As the groups on the Polish side were larger, we gave the students the possibility to use their own equipment from home (which worked in most cases fine) or to use the shared computer laboratory at the University’s campus. This proved to be problematic, as the PC’s on site were not equipped with microphones and speakers. Students were told to bring the headphones and microphones along, but some of them failed to test their headsets beforehand. It was especially problematic if they wanted to utilize the headphones normally used for listening to music on their smartphones. Although most of the “music” headphones are equipped with a microphone, those built-in microphones are not as often used. On top of that, the typical mini jack connection comes in different variants, which are not always compatible with each other. Many students found those out the hard way, failing to utilize their private headphones for the projects’ purposes. In the end we were forced to arrange stand-alone microphones and speakers, which created a slightly problematic working environment. Specifically, a bigger group of Polish students was forced to be in one place together, creating a more meeting-room environment compared to the initially intended virtual-only contacts. Another obstruction was the video signal transfer. Usually there are no problems with text and voice communication, but as soon as video is added to the mix, some lags appear. And it was not only a question of internet bandwidth (which was reasonably high onsite), but also specific video codex, which needed to be installed before running the group online meetings. Our recommendations for the technical aspects would be to run a “technical” test before the actual meetings for each of the participants, to ensure everything runs smoothly when the time for the real meeting comes.

Another problematic aspect was – to our surprise – the level of English. Some of the students on the Polish side – although declaratively at B2 level of proficiency – struggled at first to communicate in English. This problem was eventually solved with the help of other team members (who helped each other translating some of the communications), but it could have ended up differently if the teams had been completely mixed and in different places (that is, each single

participant from different country/ in front of their own computer). There is no simple solution to this problem. We can only encourage students on different levels of education to intensify their efforts to learn English, but in some countries and some training programs there are simply not enough opportunities to train students to a fluent level of English. We believe that despite the increasing role of visual communication and a quickly improving automatization of translation tools (like Google Translate), the role of English in cross-border communication will remain extremely high. We have to underscore that it is the case even for such closely related (linguistically) languages as Czech and Polish, which with enough good will can be mutually understandable in about 30-70%. Still, it was easier for students from both countries to use English – a language not native to any of them.

On the positive side – students did not have any problems as regards the creativity. We believe that differing origin of our students was an asset in this matter. Although Opole and Olomouc are only about 150 km apart, the border makes a huge difference. There are many things that the students have in common, but it is sufficient that their basic education is based on different curricula and the media in Czech Republic and in Poland focus on different topics. As a result, we end up having totally different sources for ideas. It then suffices that the students – prospective cooperators - have shown an openness to share their views and the willingness to listen to the other side, to create an atmosphere of real creativity. This is – in our opinion – one of the greatest advantages of cross border virtual teams.

## **8. Limitations and Conclusions**

The project we conducted has a limited potential to generalize its findings. What we show are a few qualitative observations of some virtual group's work properties, which happened within a specific training course that involved a few small group of people from two countries only. This means that the results may not be repeated in a different context, with different groups, or even with similar groups at a different point in time. We would highly encourage any reader to re-run the program within her or his environment and share their results with us, as they will most likely differ in each case. Nevertheless, we believe there is some worth in describing such a project. First of all, there were both features of social facilitation (especially through sharing of ideas coming from different cultural background and in the end project results) but also features of social loafing observed in our groups. Secondly, the experience enriched students taking part in it. All the participants liked the form of the projects, and judged it to be beneficial to their soft skills development. We did not follow up on their job history after graduation, but the changes to the market structure nowadays makes us believe

the skills developed within our projects are and will be of increasing value in the labor marketplace.

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## **Transgraniczne wirtualne zespoły z perspektywy stosowanej psychologii i ekonomii stosowanej. Analiza przypadku międzykulturowego programu nauczania**

### Streszczenie:

*Podczas gdy komunikacja staje się coraz łatwiejsza dzięki rozprzestrzenianiu się technologii komunikacji przez Internet (ICT), coraz więcej firm i osób staje przed wyzwaniem (współ)tworzenia i zwiększania efektywności wirtualnych zespołów. Chodzi tutaj o grupy ludzi kontaktujące się między sobą wyłącznie przez Internet, bez kontaktów w realnym świecie. Pomimo licznych zalet, do których należą między innymi niskie lub wręcz zerowe koszty finansowe oraz niezwykła elastyczność tworzenia, przed wirtualnymi zespołami istnieje też wiele wyzwań, nie widocznych z zewnątrz. W bieżącym artykule omawiamy zalety programu zajęć, zaprojektowanego do wzmocnienia umiejętności komunikacji w wirtualnych zespołach. Opisujemy projekt dydaktyczny zrealizowany jednocześnie pomiędzy Uniwersytetem Palackiego (Olomouc, CZ) i Uniwersytetem Opolskim (Opole, PL) w semestrze letnim w roku 2015. Argumentujemy, iż taki program może przynieść korzyści zarówno z perspektyw jednostkowej, jak i biznesowej, pod warunkiem podjęcia odpowiednich przygotowań.*

### Słowa kluczowe:

**zespoły wirtualne, komunikacja transgraniczna, komunikacja internetowa, zasoby ludzkie**