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COMPARATIVE COUNTRY STUDIES PISH PROJECT

Erasmus+

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The report is compiled by Aalborg University based on the country studies produced by individual Partners of the PISH consortium.

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Section 1: Introduction

This report is a comparative study, conducted in the PISH project, on Problem-based Learning, Intercultural Communications, and STEM in Higher Education. The comparative study is based on individual country reports on challenges students encounter in PBL study groups in Denmark,

Germany, Finland, Italy, and Greece. These are countries represented in the PISH project. The respective project partners are: Aalborg University, Denmark; University of Thessaly Greece; University of Eastern Finland, Finland; Comparative Research Network, Germany; INNOVED Greece; and EURONET, Italy. The cases presented in the individual country study reports (see (Pishproject.eu).

About the PISH project

The PISH project is aimed at promoting effective intercultural dialogue between students from different cultures in a Problem-Based Learning (PBL) group setting. The effective dialogues enable the students to cooperate and collaborate better without cultural bias while studying PBL projects and study groups. The breakdown of dialogue, due to cultural differences, often results in a breakdown of the group dynamics. In such a scenario, students attempt to work individually on the same task which often results in a poor project outcome. A poor project outcome does not necessarily result in a poor learning outcome for individual brilliant students. Oftentimes such students can defend their projects successfully. Students that are either not so brilliant or not brilliant at all do not fare well. In other cases, the brilliant student ends up failing, if the student's previous learning environment was not PBL but traditional learning. Furthermore, the student can also fail, if the student originates from a culture where collaboration and knowledge sharing are not encouraged or frowned upon. All in all, the inability of students, from different cultural backgrounds, to work together hurts knowledge sharing, cross-fertilization of ideas, and collaborative learning. In a STEM-based learning environment, students are bound to engage in active learning activities. A breakdown in multicultural PBL group dynamics will result in the failure of students to realize the learning goals of such a course.

Hence the project aimed at developing tools that will arm students with competencies in intercultural communications so they can realize the learning goals in their STEM-based PBL learning environment together.

About the report

To develop the tools that will arm students with intercultural competencies, it is important to understand the nature of the intercultural challenges encountered by students. To accomplish this aim, two focus group interviews were conducted with three STEM teachers and six STEM students respectively in the PISH partner countries. Half of the students were foreign students, while the other half were local students, as presented in table 1. Table 1 provides the profile of the respondents of the country studies.

The report has 5 sections. The first section is the introduction. Section 2 provides a snapshot of the profile of the respondents. Sections 3 and 4 provide a comparative summary of the feedback from students and teachers. Section 5 provides the conclusion of the report.

Section 2: Profile of the Respondents

Table 1 provides a comprehensive overview of the profile of the respondents from PISH partner countries. Extensive information on each profile are in the different PISH country studies.

Table 1: Profile of respondents to the country report.

Profile of the respondents	
• Number of teachers interviewed	36 (6 per country) teachers per country (Denmark, Italy, Greece (2), Finland, Germany)
• Number of students interviewed	36 students. 6 (3 foreign students, 3 local students each) students per country (Denmark, Italy, Greece (2), Finland, Germany).
• Names of HEI represented in the Interview	Aalborg University Denmark; University of Basilicata, Italy; University of Thessaly, University of the Aegean, Aspete, Greece; The Hasso Plattner Institute, The Technical University of Berlin, RWTH Aachen University, University of Kassel, Germany; University of Eastern Finland, Haaga Helia, Oulu University, Karelia University of Applied Sciences, Tampere University Finland,
• Countries of origin of foreign teacher(s) interviewed (if the teacher is a foreigner).	Denmark, Albania, Greece, Italian, Greek, France, Iran, Turkey
• STEM courses taught by the teachers interviewed	Economics/Mathematics, Object-Oriented Programming Cyber security, Mathematics, Natural Science, Chemistry, Physics, Education Technology, Pedagogical Applications of Computers, Computer Programming, Educational Robotics, Computing Science, Models for the development of STEM curricula, Production and evaluation of STEM educational activities, Science Teaching, Computer Science, Communications Technology, Applied Mathematics, Metal forming process, Electrical Engineering in Agriculture, Data Science, biology, engineering, special education, study advisor
• Country of origin of students interviewed	Denmark, Pakistan, Nepal, Malaysia, Italy, Romania, Morocco, Greece, Russia, USA, Germany, Spain, Brazil
• STEM discipline or field of study of the student	Software Engineering and application development, Mathematics, Informatics, Physics, Mining engineering, Architecture, Data Engineering, Media Informatics, Computer Science, Physics Engineering, Transport Engineering

As represented in Table 1 above, aside from Denmark and Italy, responses from other PISH partners were from different HEIs in Greece, Finland, and Germany.

The interview (teacher) respondents are Europeans. Aside from Denmark, Greece, and Italy where some of the teachers and students were local, other respondents (teachers and students) were foreigners. The respondents were either teaching STEM courses or STEM students.

Section 3: Intercultural Communication Challenges faced by STEM students in PISH partner countries.

This section highlights the intercultural communication barriers and challenges encountered by students within and outside the classroom. The section is divided into 2 subsections. The first sub-section provides a comparative summary of the Intercultural communication challenges experienced by students in PBL learning environment identified from the HEIs studied in each country study. The second subsection provides a similar summary but based on the teacher's observations. The comparison made in this section is not aimed at providing an analysis of which country fares the worst. Rather it is to provide a picture of the challenges. Based on these challenges, the tools will be developed.

Section 3.1 Intercultural challenges encountered by Students within the Classroom

Table 2 highlights feedback from both local and foreign students on the Intercultural Challenges and in some cases the effects of the intercultural challenges they encounter in their PBL groups.

1. Language barrier: The common feedback from students from the five case countries is that of the language barrier. In Italy Greece, and Germany, the effect of the language barrier is evident in miscommunications. These are miscommunications between students and teachers and between students from different cultures. In Denmark, the challenge foreign students encounter is the unconscious switch of language by their Danish counterparts in PBL groups. The case is the same in Italy. However, some foreign students speak Italian, but their poor mastery of the language makes it challenging for them to understand the context of the discussion. In Germany, the language barrier is experienced both ways as some German students do not understand the German accent of foreigners take time to adapt to the German accent.

Based on the responses, the language barrier did have an impact on effective dialogue, effective knowledge exchange, and the ability of students from multicultural backgrounds to learn in PBL groups represented by the respondents.

Table 2: Intercultural Challenges and effects of intercultural challenges in PBL classrooms in PISH partner countries.

	Denmark	Italy	Greece	Finland	Germany
Language barrier	x	x	x	x	x
• Miscommunication with foreign students		x	x		x
• Miscommunications with teaching staff		x			x
Cultural differences					x
• Difficulty bonding with foreign students	x	x			
• Difficulty bonding with local students	x				
• Differences in work ethics	x	x	x		x
• Lack of knowledge of the competence of the foreign student	x				
• Loneliness				x	
• Unclear expectations				x	
• Overwhelming stress and depression				x	
• Hostility				x	

2. Cultural differences: The language barrier is due to cultural differences. However, in Germany, the respondents, both foreign and local students, indicate the existence of cultural differences in their interactions with each other. In situations where there is openness and acceptance of students from other cultures, the differences disappear over time. Although the cultural difference was not an obvious answer in other countries, the effects of cultural differences (other than language barrier) was reported.

   The effect of cultural differences in PBL groups is evident in the responses from respondents from the countries studied.

   In Italy and Denmark, the students (both foreign and local) interviewed expressed difficulty in bonding across with foreign and local students respectively. In Denmark, the challenge was a result of the lack of out-of-class interaction activities that would enable local students to learn more about foreign students and vice versa. In Denmark and Italy, local students were more interested in understanding the work ethic and competence of foreign students. In Denmark and Italy, foreign students were interested in getting to bond with local students socially. In Denmark,

it was also evident that foreign students from different cultures do not always bond due to cultural influence on work ethic.

The cultural difference in difference in work ethic was also evident in Greece and Germany. In Greece, some foreign students felt discriminated against when they could not work together with a local student because of this challenge. In Germany, foreign students found it difficult in working within the punctual and efficient work ethic of Germans.

The effects of cultural differences were stark in Finland where the foreign students reported loneliness, behaviors misunderstood as microaggressions, and depression.

It is important to note that these feedbacks, though anonymized are the views of the respondents within their context and not a representation of the HEI in question or country in question. Nevertheless, the response enables the project partners to have a feel of the problem to develop informed tools for solving these problems.

Section 3.2 Intercultural challenges observed by HEI Teachers within the Classroom in PISH partner countries.

Table 3 highlights observations from teachers on the Intercultural Challenges encountered by students in the PBL groups they supervise.

The observations from the teachers in each country do match that of the students. The students expressed the intercultural challenges from an experiential point of view. However, the teacher is a third party observing the challenges. In Denmark and Greece for example, the teachers observe the collaboration challenges between local and foreign students. From the student perspective, they were afraid to collaborate due to their not being sure of the work ethic of the student from the other culture. So, it was easy for them to work with students from a familiar culture. In Denmark, the teachers also observed that students from different cultures do sometimes misunderstand communication cues and that could result in unwarranted conflict. This also has an impact on students from different cultures being willing to work across cultures- hence the unwillingness to build bridges.

Table 3: Teacher observations on Intercultural Challenges encountered by students in the PBL groups

	Denmark	Italy	Greece	Finland	Germany
Collaboration challenges	x		x		
Misinterpretation of verbal and non-verbal communication	x				
The challenge of building bridges	x				
Challenges related to not understanding the teaching and grading culture	x	x			
Language barrier		x	x	x	x
• Cultural context issues			x		x
Unclear expectations				x	
Cultural misunderstandings				x	
Overwhelming stress and depression				x	
Hostility				x	

In Italy, Denmark, and Finland, teachers also observe that foreign students often arrive from a culture with a different way of learning and studying. Hence also they did experience a similar pedagogy in their home country, but their cultural interpretations and approach to that pedagogy differ. As a result, foreign students in these countries do experience challenges related to not understanding the teaching and grading culture. In other words, they face unclear expectations and lack guidance on how to transit from their orthodox way of learning to a new way of learning presented in their new culture. Some students after some semesters get a hang of the learning culture, but others do not and will find the learning process difficult, if not discouraging.

Language barrier features again. However not in Denmark. This is because most foreign students attend English language courses. Furthermore, teachers are not privy to the language challenges faced in the groups. However, in Greece, Germany, Italy and Finland, the teachers observe this problem. This in most cases is because, aside from Finland, the courses are taught in the local language. Nevertheless, this observation corroborates the experience of students. The effect of this problem, as identified in Greece and Germany is the inability of the student, without a good command of the local language, to properly contextualize, what they hear in the class and PBL groups.

In Finland, the teachers corroborate the overwhelming stress, depression, hostility and cultural misunderstandings experienced by students in PBL groups.
In the next section, we will take a look at the challenges encountered by teachers in their attempt to solve the problems.

Section 4: Challenges encountered by HEI Teachers in solving the identified challenges.

In Denmark, Italy, Germany, and Finland, teachers noted that the intercultural problems observed in their PBL student groups were complex problems. Therefore, it was difficult to implement solutions that would adequately solve the identified problems. What was also evident in the feedback from teachers was the inadequacy of training they received in dealing with problems regarding intercultural communications in general. This is an aspect that will be taken into consideration in the development of the solutions in the PISH project.

In Greece, the solutions adopted by teachers to solve intercultural communication challenges are pedagogical tools that do not target intercultural communication but effective learning. These tools are useful but if there is a communication breakdown and possible hostilities in a PBL group, it is difficult to implement the pedagogical tools.

Therefore, based on the assessment of the responses received, there is a need for the incorporation of tools that will promote intercultural communication into the pedagogical tools used by the teacher to promote effective learning.

Section 5: Conclusion of the comparative study

The interesting finding about the responses received is that local students and foreign students want to work together. But they do not know how. Teachers also want to solve the problems, but they do not know how. In different country studies, there are different recommendations. Recommendations range from train-the-trainer initiatives, and student training to the organization of events and forums where students can be guided to break the ice.

However, the takeaway from the country studies with which the PISH project will develop tools are:

1. The need for tools to address the language barrier.
2. The need for tools to address communications aimed a promoting cross-cultural collaboration in PBL groups.
3. The need or tools that address intercultural communications via verbal and non-verbal modes of communication.

4. The need for tools that address working across cultures. This last point is not only about Intercultural communications, but the broader concept of intercultural competence, this point helps students not only communicate but develop other intercultural skills that will deal with:
    a. Building bridges,
    b. Developing the emotional and intercultural intelligence to manage cultural misunderstandings, unclear expectations, and the understanding as well as adaptation of the students to new cultural environment.

Tools will be developed in the PISH project around these themes, as inspired by the challenges identified. The tools will aid teachers to first build competence in intercultural communications as well as train students to develop their own intercultural competence. As students develop their Intercultural competence, they would have gained the intercultural intelligence necessary for a successful collaboration in a multicultural PBL learning environment.

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