



INTED 2019

COMPANY MENTORING PROGRAM FOR ENGINEERING STUDENTS

E. Torres-Jiménez, R. Bolaños-Jiménez,
R. Dorado-Vicente, A. García-Collado,
C. Gutiérrez-Montes, J.I. Jiménez-González

Department of Mechanical and Mining Engineering. Universidad de Jaén (Spain)

etorres@ujaen.es, rbolanos@ujaen.es, rdorado@ujaen.es, acollado@ujaen.es,
cgmontes@ujaen.es, jignacio@ujaen.es,

**e-mail: etorres@ujaen.es*



Abstract

1. INTRODUCTION

2. METHODOLOGY

2.1. Companies Participation.

2.2. Student Enrollment.

2.3. Activities and Evaluation.

2.4. Mobility – Internationalization.

3. RESULTS

3.1. Example of activities implemented.

3.2. Opinion Survey Results.

4. CONCLUSIONS

ACKNOWLEDGEMENT

References



HIGHER EDUCATIONAL SYSTEMS

ENGINEERING STUDENTS



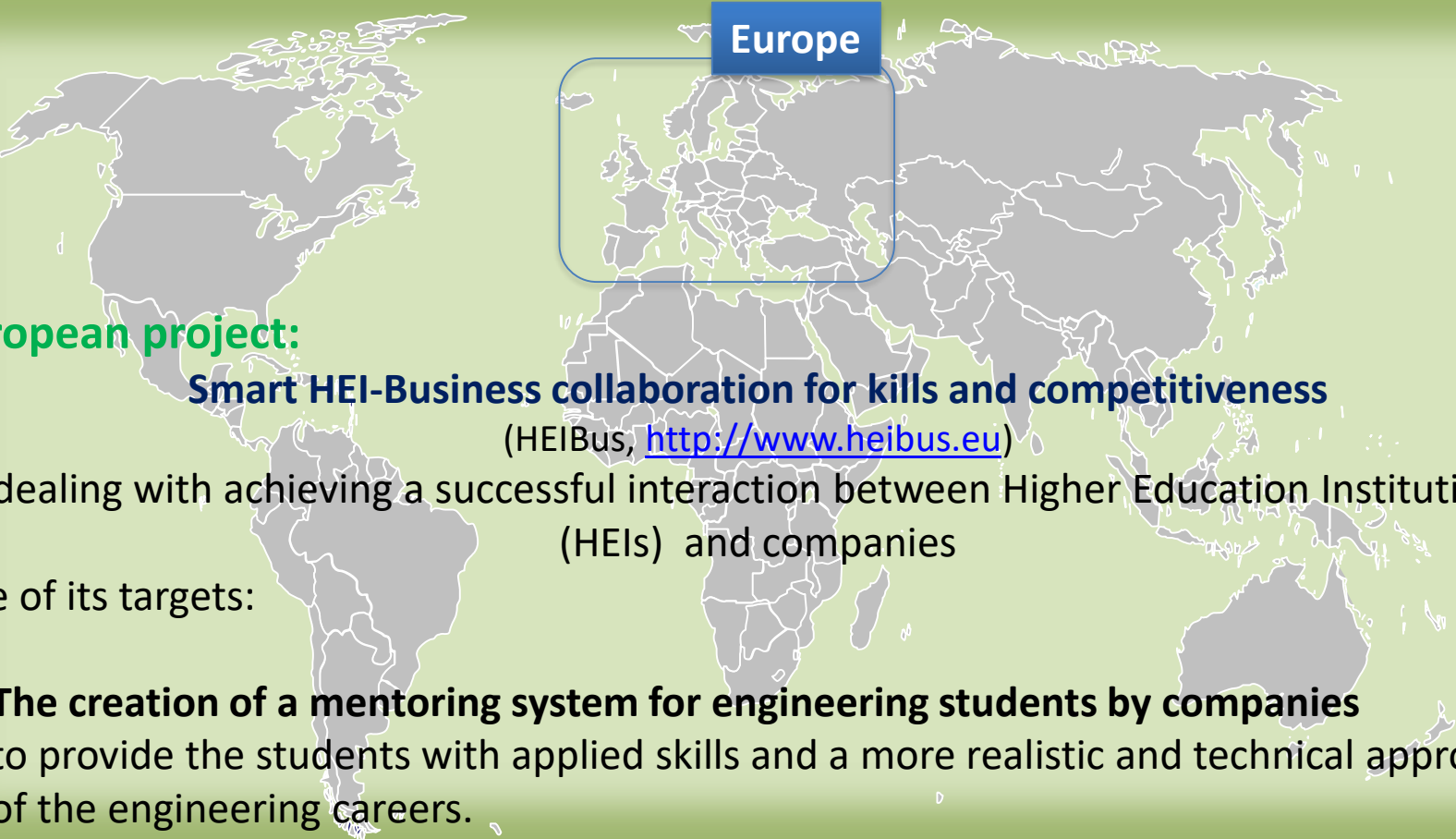
SOURCE: <https://www.ceupe.com/blog/gestion-del-talento-mentoring.html>

TARGET: Develop a *mentoring program* that brings and coordinates the advice of professors, graduated students and professionals mentors to provide more adequate contents to the students and reduce the time to get a job.

Keywords: Educational project, engineering students, company mentoring, flex mentoring, high education.



1. INTRODUCTION



European project:
Smart HEI-Business collaboration for kills and competitiveness
(HEIBus, <http://www.heibus.eu>)
dealing with achieving a successful interaction between Higher Education Institutions (HEIs) and companies

One of its targets:

- **The creation of a mentoring system for engineering students by companies** to provide the students with applied skills and a more realistic and technical approach of the engineering careers.



IMPLEMENTATION OF A COMPANY MENTORING PROGRAM AT THE UNIVERSITY OF JAÉN

INTERACTION LEVELS:

- **Company - large group** (First Courses Students) activities: mainly conferences and guided visits.
- **Company mentors - small group** (Senior Students) or individual activities: Tailored lectures, mentoring sessions, roundtable sessions with graduated students and so on.

GOALS EXPECTED AS A RESULT OF THE AFOREMENTIONED INTERACTIONS

- Bring the professional engineering world to the students.
- Guide students to syllabus.
- Strengthen companies - HEIs cooperation.



2.1. Companies participation

HOW WE FOUND THE COMPANIES

- Database of the University of Jaén for the internships in companies
- The program was publicized by means of the University web-page and brochures.

ADVANTAGES TO ATTRACT THE ATTENTION OF COMPANIES

1. Companies may have the opportunity to participate in the orientation of the contents that are taught in different degree courses.
2. Companies can advertise their participation in a project of international significance (HEIBus) and their collaboration with the University of Jaén (UJA), with the prestige that it entails.
3. This collaboration allows companies having direct access to future workers, which improves their process of recruitment.
4. This project facilitates the company members to meet researchers from the UJA, which may let them gain access to public financing through joint research projects of different scope (regional, national, international).
5. If the activity that promotes the company has associated costs, funds from the European project HEIBus and/or the UJA will cover expenses.



2.2. Student Enrolment

STRATEGY TO ENGAGE THE STUDENTS

Web advertising, posters, brochures and tutorial sessions pointing out the programmed activities

Advantages for students:

- Not mandatory program.
- Chance to attend to company workshops.
- Tutorial support by means of a network of companies and graduated students.
- Support for obtaining recommendation letters and favorable comments in professional social networks.

Procedure for their enrolment

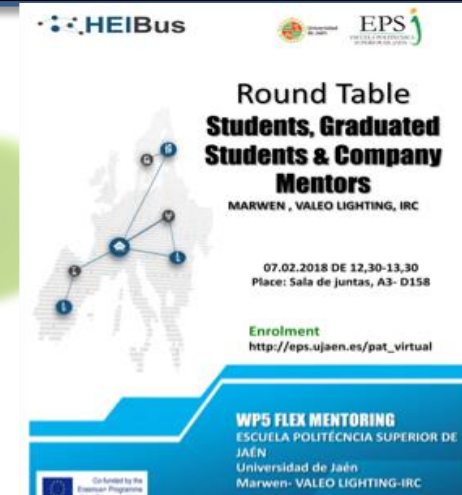


Fig. 1 b) Example of an announcement poster

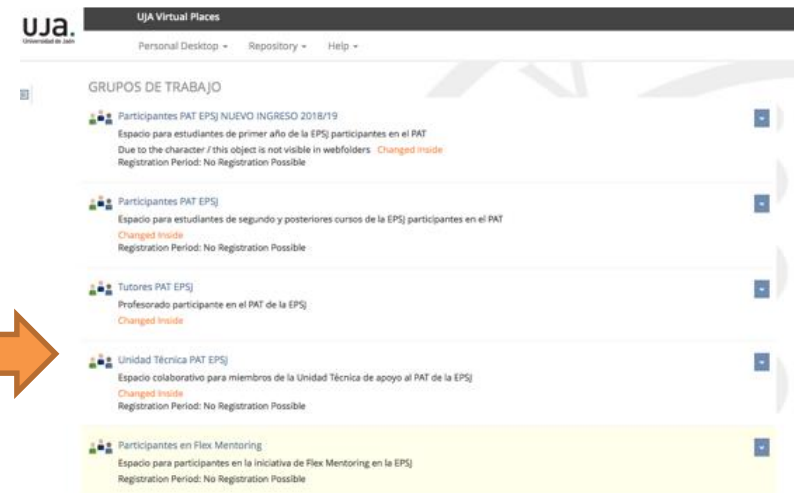


Fig. 1 a) Ilias website for enrolment



2.3. Activities and Evaluation

Activities

HEIs and companies can choose different levels of activities to take part of this program.

Some examples are:

- Different types of tailored mentoring systems: online, social networks, face to face meetings
- Informative sessions by the Company
- Visits to the Company
- Conferences and workshops with professional engineers
- Joint projects
- Summer jobs, internships or jobs after graduation



2.3. Activities and Evaluation

Evaluation of the students' satisfaction with the mentoring program

Students' survey about the round table

Provide your comments regarding this activity fostered by the European project HEIBus

* Required

1. Year of the University degree in which you are enrolled

Mark only one oval.

- Year 1
- Year 2
- Year 3
- Year 4

2. How much interesting the round table was? *

Mark only one oval.

1 2 3 4 5

Uninteresting Very interesting

3. Would you recommend this experience to your colleagues? *

Mark only one oval.

- Yes
- Not

4. What do you think about how long is this activity? *

Mark only one oval.

- It was appropriate (neither short nor long)
- Too long
- Too short

5. Have you been left with questions to solve? *

Mark only one oval.

- Yes
- Not

6. What aspects of this activity did you find most useful?

7. How would you improve this activity?

Fig. 2. Students' survey regarding the roundtable.



3.1 Example of activities implemented

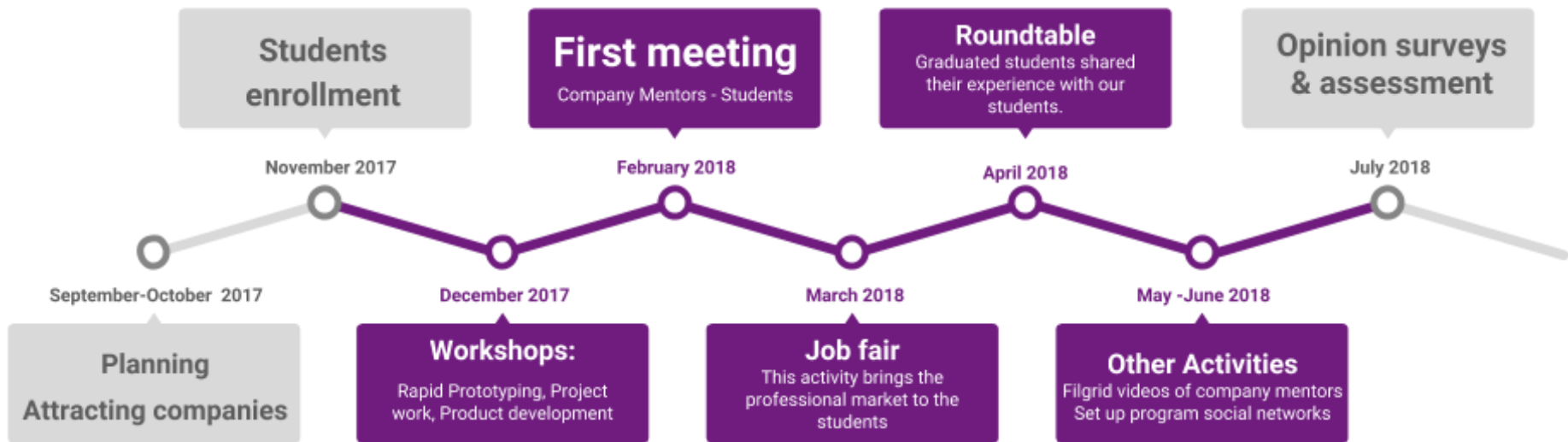


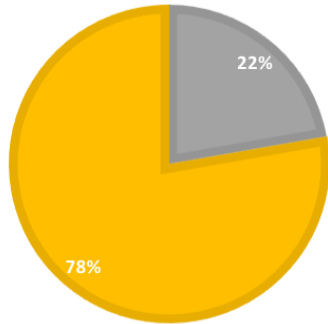
Figure 3. Course 2017-2018 Mentoring Activities implemented.



3.2 Opinion Survey Results

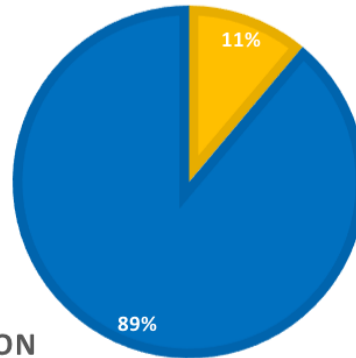
STUDENTS' DEGREE YEAR

■ Year 1 ■ Year 2 ■ Year 3 ■ Year 4



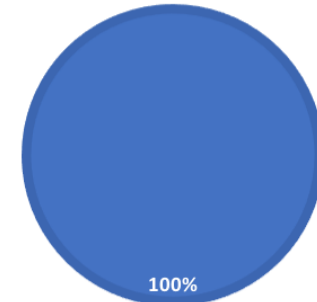
HOW MUCH INTERESTING IT WAS?

■ Uninteresting 1 ■ 2 ■ 3 ■ 4 ■ Very interesting 5



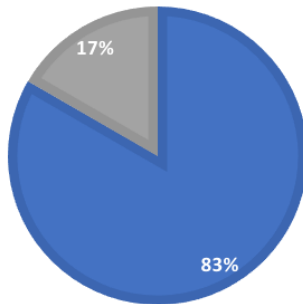
WOULD YOU RECOMMEND IT TO YOUR COLLEAGUES?

■ Yes ■ Not



WHAT DO YOU THINK ABOUT THE DURATION OF THIS EXPERIENCE?

■ It was appropriate (neither short nor long) ■ Too long ■ Too short



HAVE YOU BEEN LEFT WITH QUESTIONS TO SOLVE?

■ Yes ■ Not

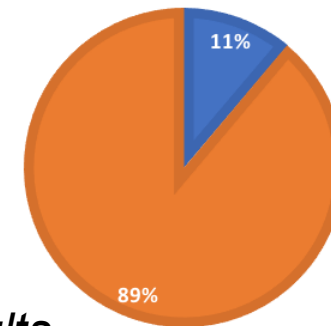


Figure 4. Students' opinion survey results.



3.2 Opinion Survey Results

Questions of free answer included in the opinion survey: (Fig. 2, questions 6 & 7).

Comments regarding **what aspects of this activity they find most useful:**

- “The possibility to interact with colleagues which know the world in which we are going to enter”.
- “Advices about how to face a job interview”.
- “Information about Internships and their usefulness”.
- “Realize that there is a large number of professional outings related to my degree”.

Comments regarding **how they would improve the proposed activity:**

- “I can’t believe what I am going to say, but if the duration of the activity were 30 min longer, it would be better”.
- “More personal experiences explaining the mistakes made”.
- “It is ok”.
- “More experiences about how to get a job without doing an internship”.
- “Increase the frequency of these meetings”.

All these results and comments support the successful of this first experience.



4. CONCLUSIONS

1.

- **The main objectives of this work comprise the improvement of the students' curricula by means of a closer cooperation between companies and HEIs**

2.

- **Provide students a first interaction with professional activities.**
- **Shorten the time required for them to get their first job.**
- **The participation of companies allows including more specific contents and knowledge, which provides a more realistic point of view and better suited professionals.**

3.

- **The methodology described is based on programming a set of activities, e.g. tailored lectures, guided visits, job fairs and roundtables.**
- **Two interaction levels are recommended: company/large group activities and company mentors/small groups activities.**



4. CONCLUSIONS

4.

- The companies were selected in a wide range of industrial sectors.
- Although these companies must fulfil some requirements, they take many advantages from their participation in the mentoring program.
- Using different media, e.g. institutional website, social networks, brochures, etc., the students were advised about the advantages of joining to the mentoring program and its non-mandatory nature. As a result, **4 companies and 26 students joined to the proposed experience.**

5.

- **To assess the impact of the proposed methodology, we prepared several surveys which give an impression about the students' opinions and recommendations.**

6.

- **The results obtained are promising.**
- **Most students consider very interesting the experience (>89%), and all of them would recommend the program to other colleges.**
- **Few students were left with questions to solve (<11%) and, taking into account that most of them found appropriate the duration of the activity (<83%), it seem that they wanted to listen to more amount of professional experiences.**
- **Some students recommended to increase the duration of the activity.**
- **The aforementioned results encourage us to go on and extend the program to all the HEIbus participant countries and to new degrees.**



- This work was supported by the Smart HEI-Business collaboration for skills and competitiveness (HEIBus) Erasmus + Knowledge Alliances 2 (KA2) project.



1. E. A. Fagenson. "The mentor advantage: Perceived career/job experiences of protégés versus non-protégés", *Journal of organizational behavior*, vol. 10, no. 4, pp. 309-320, 1989.
2. R. M. Felder, R. Brent, & M. J. Prince. "Engineering instructional development: Programs, best practices, and recommendations", *Journal of Engineering Education*, vol. 100, no. 1, pp. 89-122, 2011.
3. I. Sheridan & M. Linehan. "Work placement in third-level programmes. Roadmap for employment-academic partnerships", 2011.
4. L. C. Ehrich, B. Hansford & L. Tennent. "Formal mentoring programs in education and other professions: A review of the literature", *Educational administration quarterly*, vol. 40, no. 4, pp. 518-540, 2004.
5. L. D. Dappen & J. C. Isernhagen. "Developing a student mentoring program: Building connections for at-risk students. Preventing School Failure: Alternative Education for Children and Youth", vol. 49, no. 3, pp. 21-25, 2005.
6. S. Gershenfeld. "A review of undergraduate mentoring programs. *Review of Educational Research*", vol. 84, no. 3, pp. 365-391, 2014.
7. C. Bonnie C & M.D. Clements. "Early organizational involvement (EOI): creating successful transitions from higher education to the work place". Emerald Group Publishing Limited, vol. 24, no. 3 2010, pp. 5-7, 2010.
8. J. N. Streumer (Ed). "Work-related learning", Dordrecht: Springer, 2006.
9. C. Vedovello. "Science parks and university-industry interaction: geographical proximity between the agents as a driving force", *Technovation*, vol. 17, no. 9, pp. 491-531, 1997.
10. Royal academy of engineering [online] <http://epc.ac.uk/raeng-visiting-professors-2017-award/>. Last access in May 2017.
11. Collaborative doctoral education: University-industry partnerships for enhancing knowledge exchange [online] <http://www.eua.be/activities-services/projects/past-projects/research-and-innovation/doc-careers.aspx>. Last access in May 2017.
12. E. A. Beam. "Do job fairs matter? experimental evidence on the impact of job-fair attendance", *Journal of Development Economics*, vol. 120, pp. 32-40, 2016.
13. S. A. Sukiman, H. Yusop, R. Mokhtar, N. H. Jaafar. "Competition-Based Learning: Determining the Strongest Skill that Can Be Achieved Among Higher Education Learners", In *Regional Conference on Science, Technology and Social Sciences (RCSTSS 2014): Business and Social Sciences*. Singapore: Springer Singapore, pp. 505–516, 2016.
14. B. Skjodt Worm & S. Vihh Buch. "Does competition work as a motivating factor in e-learning? A randomized controlled trial". *PLoS ONE*, vol. 9, no. 1, 2014.



Thank you for your attention

E. Torres-Jiménez*, R. Bolaños-Jiménez,
R. Dorado-Vicente, A. García-Collado,
C. Gutiérrez-Montes, J.I. Jiménez-González

Department of Mechanical and Mining Engineering. Universidad de Jaén (Spain)

**e-mail: etorres@ujaen.es*