Peer-Mentoring Program for the Individual Attention of Engineering Students

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***Abstract*—*Contribution:* A peer-mentoring plan designed to support engineering students during their transition from high school to university. This article addresses the adaptation challenges faced by first-year students in engineering programs.**

***Background:* The transition to university is a critical period for students, marked by significant lifestyle changes and the inherent difficulties of engineering degrees. This often results in high stress levels, with some students struggling to adapt and consequently dropping out. Previous efforts to support students have shown varying degrees of success, highlighting the need for effective peer support mechanisms.**

***Intended Outcomes:* A structured peer-mentoring environment aimed at reducing stress, improving first-year students' adaptation to university life, and decreasing dropout rates. The program is designed to be well received by both mentors and mentees, thereby enhancing the academic experience for engineering students.**

***Application Design:* Drawing on existing teaching experiences and literature, the proposed peer-mentoring program involves senior students acting as mentors to first-year students. The program begins with a training session to equip mentors with necessary tools and to define their roles and boundaries. This is followed by an initial meeting during the welcome day, and continues with formal and informal interactions throughout the first semester, under the supervision of the degree coordinator.**

***Findings:* Surveys completed by both mentors and first-year students indicate a high level of acceptance and perceived usefulness of the peer-mentoring program. The results suggest that the program effectively supports first-year students in their transition to university life, with strong recommendations for its continuation in future academic years.**

***Index Terms*—Engineering mentorship, higher education, peer-mentoring, retention.**

I. Introduction

SINCE the European Higher Education Area (EHEA) was born, the society has suffered, in the worst sense, deep changes: economical, technological, and even medical; these are some of the most evident. These changes imply that we should make a bigger effort than at the beginning of the century to make *the higher education something higher* [1].

One of the pillars that supports the quality of the education at the university is the acceptance of students as the keystone of the teaching–learning process. Nowadays, under the cruel pedagogy of a virus that spoils us [2], but at the same time forces us not to forget the utopia that underlays the education process and look toward a better tomorrow [3], those approaches that highlight the social and human importance of everyone at the university as institution become particularly important.

In that way, accepting that the agreement about the differences between education and learning is not trivial [4], it is important to involve in the students learning, not only the teacher but also the students themselves and their classmates. This strategy has some benefits which have been discussed on a lot of occasions, even related with tutorial activities [5], [6], [7]. Nevertheless, as Information and Communication Technologies can help, we need to maintain our attention in a synchronous and face-to-face education (or usually known as traditional education)[1].

Students entering in an Engineering Degree from the High School get involved in an induction process that could be stressful and with negative consequences, such as maybe the drop out of the degree and even the University [8]. The reasons are, among other aspects far away from the education area, that students need to cope with a huge amount of changes and adaptations in a difficult moment of their lives. Moreover, these changes can affect their professional, personal, and academic future.

The adaptation period to the University can spend the whole first semester, being it a period specially uncertain: new subjects, new methodologies, new teachers, new socializing networks, more freedom, future uncertainty, etc. These changes can be extremely difficult for some students and define their personal and professional future [9]. When those students are enrolled in an engineering degree, an additional factor is added: its inherent difficulty [10]. Furthermore, the heterogeneous knowledge levels of the first-year students make this situation even more complicated.

The combination of all these factors can yield at: the adaptation of the student without help needed, but with an evident extra effort and a lot of difficulties (the positive one), or the frustration of the student and even the drop out of the

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[1]Due to the quick and deep changes in education because of the SARS-CoV-2 pandemic, some platforms like Microsoft Teams, Zoom, or Meet have increased the discussion about synchronous–asynchronous and not just on-site-virtual. In this way, it is interesting to rethink if the traditional education on-site should be maintained or it should be adapted.

degree (the negative one). When this second situation happens, the failure is not only due to the student but also shared between him and the university system itself.

This problem has been suffered in the Engineering Degrees at the Polytechnic School of Cuenca (University of Castilla-La Mancha—UCLM)[2]. Because of this, some actions have been developed for first-year students to make possible a quick adaptation to the university life as a general concept, and paying special attention to those activities developed inside and outside classrooms. In this way, actions are related to the initial adaptation to the University, addressing the problem of initial knowledge level and a personal monitoring during the first course. Moreover, student impressions are valued reasonably and maintaining a close manner with them through the peer-mentoring program.

Peer-mentoring, a keystone of this proposal, can play an important role in this process. In this action, a last-year student is assigned as mentor to each first-year student. The mentor acts as his adviser and guide during the adaptation process to the university lifestyle. The role of this process has been demonstrated by many experiences implemented in many universities around the world [11], [12], [13], and even in Spanish ones [14], [15], [16], apart from other programs specifically designed for first-year students [17], [18].

The impact of peer mentoring across various disciplines in higher education has been a subject of study [19]. Engineering, also a part of Science, Technology, Engineering and Maths (STEM), is no exception [20]. From this perspective, Wong et al. [21] emphasized the influence of job characteristics and mentoring on engineers' careers. Similarly, Wu et al. [22] highlighted the importance of gender-informed mentoring, especially for women in male-dominated fields. Concurrently, Agholor et al. [23] focused on the role of faculty-mentors in engineering education, while Christlieb and Luchini-Colbry [24] offered a more global perspective on mentoring. Niemi et al. [25] examined its potential as a path to retention, also exploring faculty and industrial mentoring. Collectively, these studies illustrate the significance of peer mentoring in engineering for career development, addressing gender disparities, and improving educational outcomes and retention rates.

In addition, peer mentoring in engineering education plays a crucial role as a transversal tool in higher education. The significance of peer mentoring can be combined with other educational methodologies, like Project-Based Learning [26], and is effective in addressing issues such as gender biases [27]. These studies demonstrate the diverse applications of peer mentoring, from academic support to fostering entrepreneurial skills and promoting inclusion of underrepresented groups in STEM degrees [28].

In Spain, engineering programs face several complex challenges. García et al. [29] and Sánchez-Ruiz et al. [30] addressed the shift from a knowledge-based to a competency-based educational model and the related teaching and assessment challenges. Duran et al. [31] highlighted the need for alignment with the EHEA and the Bologna process, necessitating significant changes in the educational system and curriculum design. Peer mentoring can be a key solution to these issues, aiding curriculum adaptation to meet the needs of first-year students by providing support and real-world insights. Consequently, it is not surprising that Spanish universities continue to increase their accompaniment and mentoring programs [32], which could become specific curricular structures for educational innovation as allowed by Spanish legislation (RD 822/2021, Art. 21).

Regarding tutoring, a theoretically more general concept, peer-mentoring can be defined as an excellent methodology in the EHEA [33]. Nevertheless, there are some goals to reach as the necessary training of teachers involved—and the peer in the present proposal—, the need of more research and studies about the development and results of this kind of programs [34], the implication and commitment in orientation actions [35] or the necessity to deal with a tutoring project more integral and comprehensive [36]. Taking all these actions into account we can reach a real implication of everybody, and as a result, a better orientation, which is the key in tutorial actions in other education levels [37], and which can be progressively valued at the university.

Focusing now on the kind of mentoring chosen—between classmates—, it is possible to observe that "peer-mentoring has emerged as a viable strategy in higher education institutions to increase retention rates and, overall, support the whole student as they transition to college life" [38]. Furthermore, it is possible to understand that we are using an effective pedagogical strategy, maybe even critical, to attend specific necessities of first-year students.

Taking all the former into account, and according to the literature and especially our own experience in the Polytechnic School of Cuenca concerning problems of first-year students during years, the main goals established for the peer-mentoring program developed are:

1) make the adaptation of first-year students to the university environment easier;
2) guide students in their academic necessities, paying also attention to the personal ones, and not forgetting the professional ones;
3) involve last-year students in the previous goals, obtaining a horizontal and democratic educative process.

In Section II, the methodology of the program is presented. Next, in Section III, the results obtained are figured up and discussed. Finally, in Section IV, the conclusions of the research are commented.

II. Methodology

According to the literature, the peer-mentoring program starts from the premise that it is easier for students to relate to other peers and to convey their doubts and problems to them. At least it is easier than to do it directly to some teacher, who are seen especially at the beginning of their university

[2]UCLM is a multicampus medium-size general-purpose university, which is regionally divided into six campuses and whose attention has always been characterized by being close to and less crowded than other universities. Polytechnic School of Cuenca belongs to the Campus of Cuenca and holds the degrees on Building Engineering, Telecommunications Engineering, and Biomedical Engineering.

studies, as more distant and inaccessible and with whom they gradually gain confidence as the development of the courses and the degree progresses.

In this context, the mentoring program aims to provide this support to first-year students who need it, by equipping fourth-year students, who act as mentors, with the necessary tools. Last-year students act in that way as advisers, guides and supports with the basis of their own experience in topics related to the city, campus installations or academic tasks, but being aware that mentoring is a form of accompaniment in which first-year students are progressively more aware of the decisions to take by themselves, not by their mentors.

The recruitment of the volunteers to be mentors takes place during the coordination meetings with students the course before their mentoring, more specifically in those carried out with last-year students. In these meetings the mentoring program (although known) is presented, and students are encouraged to join it as mentors. The final number of volunteers is around 20% of the amount of final-year students and, taking into account the number of first-year students, the volunteers are enough because it is possible to have one mentor for each 6–8 freshmen.

Final-year students who are interested in contributing to the program by acting as mentors should register for a preparatory course in which they are trained in the role of mentor and the tasks they should—and should not—perform, thanks to the specific collaboration of experts from the psychopedagogical field, belonging to the Pedagogical Department. This course takes place before the start of the academic year, so that mentors can start working on the very first day of the course. This training course deals with the following topics.

1) What does it mean to be an university student? Awareness-raising.
2) What is peer-mentoring? Fields of action.
3) Help needed by first-year students.
4) Mentor skills and working tools.
5) Action planning, follow-up, and mentoring reports.

In addition, the limits of their role as mentors are set, and they are taught where they should redirect first-year students to face problems that may arise and for which they do not have an answer or a more expert help is needed, e.g., problems of credit recognition, for which they should refer to the head of studies.

After the completion of the mentorship program, the mentors receive a diploma to certify their participation and a recognition of 1 European Credit Transfer System (ECTS) for their academic record.

At the beginning of the course, the number of freshmen is divided into smaller groups (maximum 6–8 students). Each group is assigned a mentor, who is provided with the personal data of the students. Particular attention is paid to current data protection regulations (Spanish Organic Law 3/2018, 2018 [39]). Mentees are paired with mentors almost at random in those cases where no special attention is needed. Nevertheless, when there are special situations, such as Erasmus[3] students, a more detailed assignation is carried out, for example an Erasmus mentee is assigned to a mentor with a good English level or that have been in an Erasmus stay previously.

The degree supervisor, together with the team of teachers in charge of the above mentioned training, supervises the whole process in a coordinated way during its implementation and subsequent evaluation.

The next milestone within the mentoring program is to introduce mentors to first-year students. The head of studies and the degree supervisor introduce the mentoring program during the welcome day event for new students at the school. This event occurs on the first academic day of the course, handing out the list to the first-year students and, at the same time, the mentor assigned, who is in class, is introduced to each one. Due to this, they have a first contact between both groups, which is not only visual, since at the end of the session, they are encouraged to meet them and establish a first meeting with a view to schedule a more formal one.

Thus, throughout the first semester, freshmen and mentors perform as many follow-up meetings as necessary, always relying on the support and advice of the degree supervisor. These meetings may be convened at the initiative of the mentor or at the request of one/s of the first-year students to solve a specific problem. Meetings are not always formal in nature, but most of the time they take place during class changes, breaks in the cafeteria and even via telematic platforms such as WhatsApp, which facilitates the interaction between freshmen and mentors and creates the right climate of trust so that new students can raise their doubts and concerns and seek advice from their respective mentors. All of this, especially in the cases of noninstitutional tools, counting on the guarantees of data protection mentioned.

Concerning mentors, they are not alone during this process. They hold regular meetings with the degree supervisor, who oversees the entire process and advises mentors on subjects where they have less or no experience. Additionally, the supervisor establishes a system for task management through intermediate and final reports, which serve to evaluate the progress and effectiveness of the program. Moreover, at the end of the program, a meeting takes place between degrees supervisors, the teacher of the training course, and mentors in order to evaluate the program.

In addition to the aforementioned reports and meeting, the collection of information for the evaluation of the mentoring plan is carried out on the basis of two surveys. The first one is for all first-year students, who are all enrolled in the mentoring program, while the second is for mentors, who are properly trained volunteers. In both surveys, agents involved in the mentoring program are asked by nine questions on a qualitative scale, with a final open question in which they are free to comment on everything they want about the program. Questions of the surveys for mentees and mentors are shown in Tables I and II and analyzed in Section III jointly with the report and meeting comments.

III. Results and Discussion

The qualitative and quantitative information collected from the reports, meetings, and surveys, and aggregated during

[3]EU programme for education, training, youth, and sport (https://erasmus-plus.ec.europa.eu/es).

TABLE I
RESULTS OF SURVEYS OF FIRST-YEAR STUDENTS (PERCENTAGES)

0.a. Previous studies	**High School**	**Other**				**No answer**
	83.1	11.2				5.6
	Cuenca	**Other**				**No answer**
0.b. Where are you from?	42.7	52.8				4.5
	A lot	**Considerably**	**A little**	**Not at all**		**No answer**
1. Usefulness of the program	24.7	51.7	22.5	1.1		
2. Appropriate methodology	14.6	52.8	28.1	2.2		2.2
3. Appropriate treatment of mentors	42.7	32.8	15.7	2.2		1.1
	> 10 times	**6-10 times**	**1-5 times**	**Never**		**No answer**
4. Meetings with the mentor	5.6	9.0	66.3	18.0		1.1
	WhatsApp	**E-mail**	**Telf**	**Face to face**	**Other**	**No answer**
5. Way of contact	67.0	0.0	0.0	27.7	1.1	4.3
	Yes	**No**				**No answer**
6. Would you like to be a mentor?	55.1	44.9				0.0
	Very Positive	**Positive**	**Neutral**	**Negative**	**Very Negative**	**No answer**
7. Global evaluation of the program	22.5	42.7	27.0	6.7	0.0	1.1
	Yes	**No**				**No answer**
8. Would you like to change anything?	19.1	80.9				0.0
9. Should the mentorship program be repeated?	89.9	9.0				1.1

TABLE II
RESULTS OF SURVEYS OF MENTORS (PERCENTAGES)

	A lot	**Considerably**	**A little**	**Not at all**	
1. Usefulness of the program	52.0	48.0	0.0	0.0	
2. Appropriate training	28.0	56.0	16.0	0.0	
3. Appropriate planning	20.0	60.0	20.0	0.0	
4. Appropriate methodology	20.0	64.0	12.0	4.0	
5. Appropriate treatment of freshmen	40.0	40.0	16.0	4.0	
6. Appropriate duration of the program	32.0	48.0	20.0	0.0	
	Very Positive	**Positive**	**Neutral**	**Negative**	**Very Negative**
7. Global evaluation of the program	48.0	44.0	4.0	4.0	0.0
	Yes	**No**			
8. Would you change anything?	40.0	60.0			

six academic years (2017/2018 to 2022/2023) allows us to obtain data with sufficient quality and consistency to extract reliable and verifiable results. Based on the data and literature reviewed, it can be affirmed that the mentoring program has met its proposed objectives since its initial implementation, particularly in relation to STEM [20] and student retention [25]. In this context, it is challenging to determine the extent of student attrition that might have occurred in the absence of this program. Nonetheless, the results, at least, encourage us to believe that the program's influence has been decidedly positive. Therefore, one of the main outcomes of this contribution is the mentors' favorable acceptance of this methodology, a key component in the successful operation of this activity, thereby making their training essential. Through meticulous planning and monitoring, training, and evidence collection, we increase the chances of success for a methodology that is widely accepted under the auspices of the EHEA, and Spain in particular, such as mentoring [32]. All the mentors, without exception, affirm that the program is very useful and that it should be repeated year after year. As a proof of the depth of this program, it is possible to state that there have already been mentors who were mentored, so that the program not only has its continuity guaranteed but also demonstrates the benefits for both, freshmen and mentors.

It is interesting to note that when first-year students are introduced to the mentoring program on the first day of class and meet their mentors, they respond positively. They feel relieved knowing they have a classmate who will guide them through their initial steps at the university. These mentors, having experienced the same transition, understands their feelings and the numerous doubts they may have. The mentors' background in these experiences greatly aids new students. Although this may seem like a personal opinion, it is supported by feedback from other participating teachers during coordination meetings and discussions with first-year students, especially those who later become mentors.

The first contact between first-year students and mentors during the welcome meeting is revealing of the interest that this program arouses in the new students, because according to the mentors, since the very first moment they are overwhelmed with questions and the first meetings are scheduled. Not surprisingly, one of the main fears faced by first-year students is, simply but intricately, to find their place in an unfamiliar environment, far from their hometown. In these meetings, which can be of the whole group of freshmen or more individualized, it is possible to differentiate several kinds of topics that can be grouped chronologically in the following.

1) To provide information to new students about the Polytechnic School of Cuenca, the University (location of the different departments and services), campus, and city lifestyle. This is mainly useful for students from other populations who sometimes live independently for the first time.
2) Recommendations for addressing certain academic tasks, lab workload, strategies for partial exams, general impressions of school, etc.

3) Advice on academic planning related to the desirability and/or priority of the subject selection.

During the coordination meetings that are held periodically with mentors during the first semester, an important fact emerges and highlights the usefulness of the mentoring program at the beginning of the course, and particularly for those students from outside the city where the campus is located. This usefulness, while continuing throughout the first year, becomes less imperative as students become accustomed to the university lifestyle. It is also important to highlight the fundamental support provided by this mentoring program for students from other countries and cultures who may have some initial difficulty with the language, our customs and our university system.

The results of the 89 surveys conducted with first-year students during the period between the 2017/2018 and 2022/2023 academic years are shown in Table I. The following results can be figured out from its analysis.

1) The vast majority (83.1%) of new students come from the High School and 42.7% of them from the same city where the campus is located.
2) In most of the cases (66.3%) up to five meetings have been established with the mentor during the first half of the year, being the main way of contact WhatsApp (67.0%), followed by face-to-face meetings (27.7%).
3) Mainly, more than 76% of freshmen consider the program useful or very useful. It should be noted that among those who classify it as least useful are students from the same city where the campus is located.
4) Students are more critical about the methodology used, with a greater dispersion of responses in this respect, although more than 67% consider it useful or very useful. These results lead us to believe that the perception shown is conditioned by the way each mentor acts, and even by his degree of commitment. These results confirm the need to update and monitor the previous training programs for mentors in order to improve it. However, in more than 80% of the cases it is recognized that the treatment received from all the mentors have been very appropriate, always respectful and continuously offering their collaboration to help first-year students with the needs and challenges they should face.
5) It is interesting to note that more than 55% of the students surveyed consider themselves to be mentors by the time they reach the fourth year, which is a guarantee of the continuity of the program in the following years, and has been contrasted by the fact that in the last years mentors were mentored years ago.
6) The program as a whole is generally regarded as positive or very positive (65.2%), with clear support for the program to continue as designed, being only necessary to make minor adjustments in order to improve its effectiveness. Among these adaptations, students suggest that they should be provided with extra notes or tutoring, which is beyond the scope of the mentoring program; in addition to greater attention and initial support, which again we assume is determined by the way each mentor acts and should be corrected in the initial training session.
7) With regard to the open question, student feedback indicates that this mentoring program facilitates integration, allows dealing with experienced students to whom it is easier to comment problems rather than speaking directly to the teacher, and helps to understand the school, the degree and teacher's methodology in an easier way. Moreover, it is also felt that the effectiveness of the plan is associated both with the students' concept of who is a mentor and with the mentor's own profile, so that a careful explanation of the role of the mentor and the choice of the mentors and their training are key to the usefulness and effectiveness of the program. These two aspects, together with the actions that each mentor can and should carry out, have always been an essential part of the content of the training program.

Analyzing now the surveys carried out by the 25 mentors from 2017/2018 to 2022/2023 academic years, the results shown in Table II highlight the usefulness of the program helping students to a better adaptation to the Polytechnic School of Cuenca and university engineering studies in general. The training received seems adequate in an 84% of the cases, although each course has been refined based on suggestions made by mentors and first-year students, as well as on the needs and advances in the field of mentoring, in order to adapt it as much as possible to the environment of the center and the type of studies (engineering degrees in our case).

The duration of the plan is perceived as adequate or very appropriate in most cases (80%). However, some opinions suggest that extending the program beyond the first semester would be more beneficial. A noteworthy proposal, aligned with UCLM's understanding of personalized tutors per EHEA implementation changes [40], is the introduction of mentors and first-year students from the beginning. Opinions on the treatment received by freshmen are generally positive, with 40% rating it as fairly good and 40% as very good. Occasionally, misunderstandings about the mentor's role lead to inadequate treatment, but these situations are promptly addressed by the degree supervisor overseeing the mentoring program.

Finally, from the viewpoint of the mentors, the overall assessment of the proposed plan is positive (44%) or very positive (48%) and all of them indicate that peer-mentoring should continue in successive courses. Mentors also indicate interesting suggestions for trying to improve the relationship between mentors and freshmen with some more entertaining activities, or with more informal meetings, maintaining a fluid relationship throughout the course. The implementation of these suggestions has ensured that the program continues with good health and acceptance.

As negative points and limitations of this program, there is the already mentioned fact that some first-year students misinterpret the role of the mentor, believing that it is a "private teacher" to help them to perform any of the tasks or practices that are asked to do in the subjects. Being aware of this circumstance, in the training session, it is indicated that in these cases it is best to redirect the students to the tutoring sessions of each teacher and, in case of conflict, the problem is tackled by the degree supervisor. These limitations underscore the need for studies like the one at hand, enabling us to detect irregularities

or misunderstandings in the mentors' interpretation. This way, we can strengthen the training or redirect certain activities that could potentially undermine the pursued objective. Of course, these descriptive data can and should serve as the basis for more in-depth and detailed studies. This does not make them any less important or decisive as an essential step to advance in our pedagogical work. In addition, we are faced with a training plan specifically designed for an engineering degree and with a reduced student population that presents and demands the characteristics and needs of a multicampus university, such as UCLM, which is regionally divided and whose attention has always been characterized by being close to and less crowded than other universities.

IV. Conclusion

Although there are still challenges to be faced about mentoring (training of participants, involvement of participants, adapted supervision tools, etc.), we find a strategy, imported from the United States, with more than a century of existence, whose literature confirms that it is an optimal methodology for meeting the academic and social needs that higher education demands [8], and that can even help in critical decision making or in dealing with unfamiliar situations about which one has no experience.

This is what has been experienced and proven with the peer-mentoring plan that is implemented in the undergraduate studies of Engineering Degree at the Polytechnic School of Cuenca (UCLM) since the 2017/18 academic year.

Thanks to the work of mentors and their interaction with the new students from the very first day, the number of cases of disoriented and bewildered students during the stage of conditioning for university life has been reduced, especially for those students who come from populations other than the one in which the campus is located, being the ones who benefit most from the mentoring plan as it is pointed out in meetings with mentors during the program.

The mentoring plan is most effective at the beginning of the first semester and evolves until the end of it (and in some cases until the end of the year). At the beginning, the issues are more focused on how to do things at school, on campus, and in the city. As the course progresses, the issues shift toward strategies on how to tackle some academic tasks or exams and ends with tips for the next year's enrolment.

This mentoring program has proven to be very useful for the vast majority of newcomers who have gone through it; they all recommend that it continues to develop in the same way and many of them want to be mentors when they reach the fourth course. For their part, mentors have also recognized the positivity of the plan and recommend its maintenance, as they consider it to be of great help to first-year students.

All of the above figure out the success of this peer-mentoring plan in engineering degrees, which encourages us to continue reiterating this program. However, this study has a number of limitations, such as the reduced participation of last-year students—although representative enough given the enrollment rate in this studies—, and even the participation of mentees, mainly those from the population where the campus is; or the particularities of the degree, whose influence determines the needs to be met by the tutorials and mentoring actions [36]. Similarly, mentoring, like any other teaching methodology, is not a magic wand that guarantees seamless quality of the educational process. We can note, for example, the intimidating and dangerous challenge of making the mistake of making mentors believe that they have to become a "model to be followed" by their mentored students [41], an aspect that could at least partly be solved by a greater focus in what is understood by mentoring, as well as the differentiation of different accompaniment roles, such as, for example, that of counselor (teacher/tutor), and that of a companion or mentor [42].

Finally, we can also identify future research directions, such as integrating this methodology with Service Learning [43] or Problem-Based Learning. For instance, monitoring the time spent and its application in different contexts would be valuable [44]. Additionally, a more detailed examination of the mentoring program's benefits for freshmen, mentors, and faculty is desirable. This could extend to the impact on engineering degrees and the university as an educational institution serving both science and society. Moreover, mentoring should be seen as a space for discussion and reflection, not just a bilateral interaction, fostering dialog, and the development of shared meanings between first-year students and mentors.

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