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Mentoring gifted high school graduates, future students in the natural sciences: An example of good practice

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INTRODUCTION

Mentoring is known as one of the oldest forms of human development. Today, it is considered a common form of education, a dynamic interpersonal relationship that can be either informal or formal (Lindt & Blair, 2017). The role of mentors in guiding gifted mentees varies depending on the stage of development and area of research content. In addition to teaching content, mentors should also pay attention to the development of psychosocial skills of mentees with active learning by understanding and critically evaluating the results obtained (Subotnik et al., 2021). The relationship between the mentor and the mentee has advantages and disadvantages (Keiler et al. 2020).

I. Selection of the institution and the topic of the research task

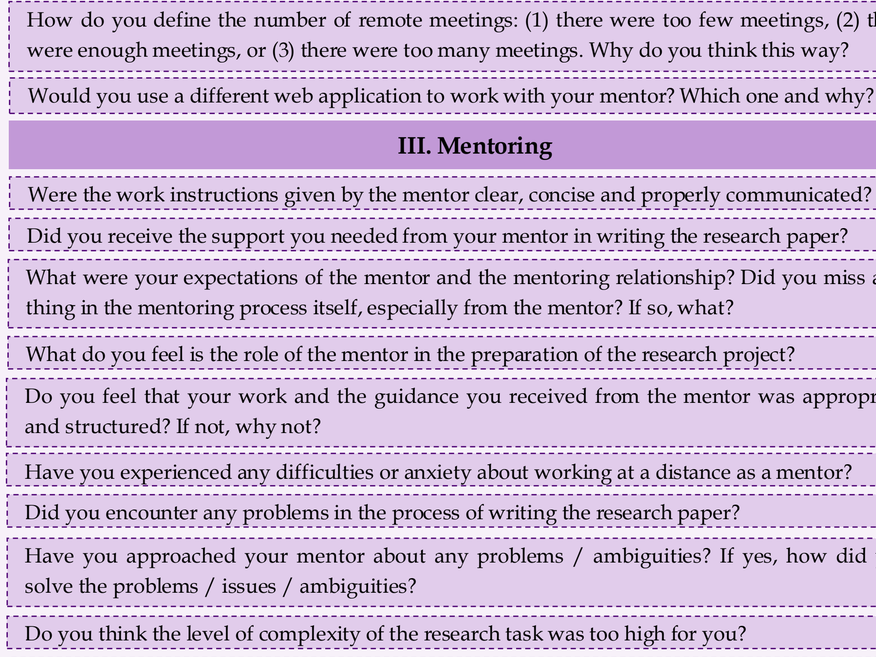
- You are conducting the research assignment as part of your Matura in biotechnology. How did you decide for the Faculty of Education and Biotechnical Faculty as your external institution?
- Did you like the topic of the research assignment? If not, what topic would you rather choose?

II. Mentoring a research project at a distance

- Mentoring of your research assignment was done remotely due to the COVID -19 epidemic. What do you think are the advantages of such mentoring?
- Could you point out any disadvantages of mentoring a research assignment remotely? If so, what are they?
- The mentoring took place remotely using the collaborative online environment MS Teams. Was the online communication tool appropriate for you? Give reasons for your answer.
- What did you like or dislike most about the MS Teams collaborative environment?
- How do you define the number of remote meetings: (1) there were too few meetings, (2) there were enough meetings, or (3) there were too many meetings. Why do you think this way?
- Would you use a different web application to work with your mentor? Which one and why?

III. Mentoring

- Were the work instructions given by the mentor clear, concise and properly communicated?
- Did you receive the support you needed from your mentor in writing the research paper?
- What were your expectations of the mentor and the mentoring relationship? Did you miss anything in the mentoring process itself, especially from the mentor? If so, what?
- What do you feel is the role of the mentor in the preparation of the research project?
- Do you feel that your work and the guidance you received from the mentor was appropriate and structured? If not, why not?
- Have you experienced any difficulties or anxiety about working at a distance as a mentor?
- Did you encounter any problems in the process of writing the research paper?
- Have you approached your mentor about any problems / ambiguities? If yes, how did you solve the problems / issues / ambiguities?
- Do you think the level of complexity of the research task was too high for you?
- What did you like best about working with / having a relationship with the mentor?
- If you could choose, would you choose group or individual work to prepare a similar research task? Explain your decision.
- Were your expectations regarding the research task met and to what extent? If not, why not?



THE AIM OF THE STUDY

The aim of this paper is to present the mentoring process of gifted high school graduates, as an example of good practice. The paper evaluates the advantages and disadvantages of the online mentoring process, the quality and impact of the mentoring relationship in preparing a research project during the epidemic COVID-19. It also presents online mentoring as an alternative form to the well-known "traditional mentoring", that is usually carried out in educational institutions.

METHODS

Our study involved 5 gifted high school graduates (average age 18 years) and 2 mentors, teaching assistants at two faculties of the University of Ljubljana (average age 30 years). The data collection instrument was a structured interview with 20 questions divided into three thematic sections. The mentoring process was conducted in 20 two-hour meetings, via the online collaboration environment MS Teams, from October 2020 to February 2021. The purpose of the contact hours was to discuss the work done, the results obtained, and to clarify further research questions.

RESULTS

The topic of the research project was offered to the students by the school, which has cooperated with both faculties for many years. All the participants liked the offered topic very much. The students emphasized the time saved by the many trips to the school as the main advantage of distance mentoring, while they highlighted the lack of personal contact, which they missed the most, as the main disadvantage. The online environment of MS teams seemed very convenient and consumable to all participants, especially since they had already used it in school and were therefore familiar with its operation. Students felt that the number of meetings was sufficient to prepare a research paper. Students praised the responsiveness of the supervisors and the fact that the supervisors were always available when problems arose. From the responses obtained through the interview, the following key skills of a good mentor can be highlighted:

(1) Appropriate professional qualifications and pedagogical-andragogical approach;
(2) Experience and skills to perform the role of mentor;
(3) Knowledge of the content being explored by the mentee;
(4) Ability to organize the work in a way that allows for the exchange of ideas;
(5) Interest in the research;
(6) Assistance with the timing and program of the work;
(7) Encouragement of independent research and responsibility in the work;
(8) Assistance in reducing stress and solving problems; and
(9) Assisting and encouraging the candidate in writing and publishing articles.

Because the work was sensibly structured and divided into smaller sections, students were not stressed during the research. In addition, the difficulty of the task was rated as reasonable. Some problems were encountered with the terminology of the chemistry of natural products. Students overwhelmingly preferred to work individually rather than in a group. Equally able and diligent workers are preferred for group work.

CONCLUSIONS

The graduate students rated online mentoring as an effective way of guiding them through the research process. However, they pointed out that "traditional mentoring" would be more appropriate for this type of research. They also highlighted some changes and adjustments that were made within the research process as a result of the online mentoring. For example, the research process did not follow the original arrangements and consequently the research project took a different form in terms of content and implementation. According to the graduates, these changes mostly had a negative impact on the originally defined research plan, as the originally empirical research project became a theoretical one.

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