



The Development of a New Generation of Teachers in the ICT Field

Aušra Gadeikytė¹, Karolis Tarutis², Lukas Paulauskas³, Kęstutis Jankauskas⁴

Department of Applied Informatics, Faculty of Informatics, Kaunas University of Technology, Lithuania¹

Faculty of Informatics, Kaunas University of Technology, Lithuania²

Department of Software Engineering, Faculty of Informatics, Kaunas University of Technology, Lithuania³

Department of Multimedia Engineering, Faculty of Informatics, Kaunas University of Technology, Lithuania⁴

Abstract

Nowadays, finding young and motivated lecturers in the field of Information and Communications Technology (ICT) becomes challenging. This necessity of teachers raises a question of how to engage more students to become future teachers in the field of ICT. For this reason, the Kaunas University of Technology Faculty of Informatics has started the initiative “The Development of New Generation of Teachers (DONGOT)” in 2023. This initiative is based on learning from mentors (lecturers). This pilot study presents students' and mentors' motivation, attitudes, and experiences throughout the DONGOT initiative. The investigation was conducted through questionnaire surveys. In conclusion, this pilot study facilitates the identification and development of techniques for how to involve students to become future educators. It was found that this initiative had a positive impact on participants.

Keywords: Academic career, learning from mentors, teaching experience

1. Introduction

Nowadays, one of the biggest challenges in universities is to engage and encourage students to pursue PhD and a teaching career. According to Bergmark et al. [1], Balyer et al. [2] the main reasons for choosing a teaching career include extrinsic, intrinsic, and altruistic motivations. Extrinsic motives are related to economic and social status. For instance, salary, status, and working conditions. Intrinsic reasons include the importance of teaching, as well as a passion for teaching, subject knowledge, and skills. Altruistic motives are more orientated to understanding that teaching is a meaningful profession, as well as the desire to support student development and, of course, make a difference in society [1], [2].

An academic career path includes different activities such as research, teaching, administrative roles, expert activities, or a combination of all. For example, a professor may conduct research, educate students, and hold administrative positions, such as committee chair or faculty dean [3]. However, it is very difficult for educational institutions to compete with businesses. In the Lithuania context, there is a large difference in monetary incentives between the education and information technology sectors [4]. Therefore, it is quite challenging to inspire students to become future teachers, particularly in the field of ICT. So, it is important that students interact with faculty members. This interaction allows students to gain a better understanding of various perspectives on academic career paths. It also develops a sense of community, professional skills, and social skills. Mentorship programs are essential for developing and supporting future educators. Mentors can provide valuable feedback and assist student teachers in self-evaluation, pointing out areas for improvement and offering recommendations for additional training [5], [6].

This study represents the case study of the Faculty of Informatics of the Kaunas University of Technology (KTU) [7]. Ensuring the quality of study programs depends on the competencies and motivation of the teachers working in the study programs (both subject and pedagogical), as well as their workload and other conditions. In the Faculty of Informatics, one of the challenges is to ensure the required number of academic staff with relevant competence in particular fields of study. The main factors for this trend include aging teaching personnel, PhD students who prefer to work for companies and financial motivations. Currently, 26 PhD students study at the Faculty of Informatics, while only 6 PhD students work as lecturers. Furthermore, it might be difficult to find enthusiastic lecturers in the future. For this reason, the Faculty of Informatics [7] has started an initiative “The Development of New Generation of Teachers (DONGOT)” in 2023. This mentorship initiative is



dedicated to engaging students in Faculty activities, to encourage them to pursue MSc as well as PhD and of course to become a future educator.

The aim of this pilot study is to identify students' and mentors' motivation, and experiences throughout the DONGOT initiative. The pilot study was carried out using questionnaire surveys containing closed-ended and open-ended questions.

2. Methods

DONGOT initiative is based on mentorship. The long-term goal of the DONGOT initiative is to minimize the risk of teacher shortages in the ICT field. At the beginning of this initiative, each department of the faculty of Informatics had to list the subjects for which it would be challenging to find teachers in the next five to ten years and to propose a mentor for these subjects. Mentoring, according to the literature [8], is a continuing but informal relationship focused on long-term goals. At this moment, the DONGOT program covers various subjects in the informatics faculty such as 3D modeling, web development, server maintenance, computer networks, internet of things, cyber security, and virtual reality. DONGOT initiative activities during different study cycles are depicted in Fig. 1. All students who join the DONGOT initiative begin with competency evaluation assignments. Then receive development tasks (see Fig. 1.). For example, third-year students can assist teachers during laboratory work lectures. DONGOT initiative offers workplace, professional internships, scholarships, conferences, and employment to students. Also, the DONGOT program includes training and courses related to leadership, didactic, and professional development for students and mentors. It should be noted, that mentors play a crucial role in this initiative. The mentors had to prepare competence assessment tasks, development tasks, and tasks related to teaching practice, research, and project activities. Additionally, encourage students to take part in study promotion events.

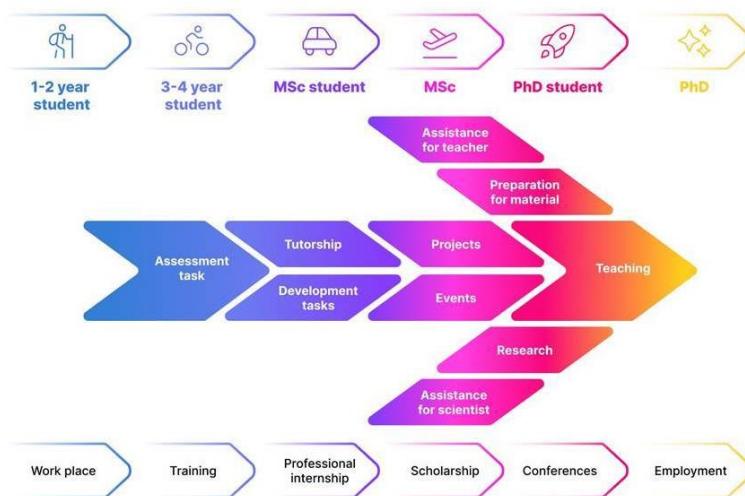


Fig. 1. Principal scheme of the DONGOT initiative

At the beginning of the DONGOT initiative, there were 8 lecturers (mentors) from different disciplines and 22 students. However, after the fall semester, the number of students has dropped down to 16, and the number of mentors has dropped down to 7. The general information about DONGOT initiative participants is presented in Table 1.

Table 1. Distribution of students in the DONGOT initiative

		Number of participants in the fall semester	Number of participants in the spring semester	Percentage, %
Gender	Female	3	3	100%
	Male	19	13	68.42%
Year of Study	1-2	9	6	66.66%
	3-4	12	10	83.33%
	5-6	1	0	0%
	Total:	22	16	



The pilot study was conducted through a questionnaire survey. The students were asked to respond to 7 open questions and 8 closed questions. In order, to identify their experience with DONGOT activities. The survey questions are presented in summarized Table 2. It should be noted, that questions were designed from different perspectives related to the future and expectations, feedback, and self-reflection.

Table 2. The questionnaire survey of students

		Questions:	Options:	Related to
Open Questions	Q1:	What kind of job position do you expect after graduation?	-	Future and expectations
	Q2:	What salary do you expect to earn after graduation (after tax deduction)?	-	
	Q8:	What do you like about the DONGOT initiative?	-	Feedback
	Q15:	What should be improved in the DONGOT initiative?	-	
	Q5:	What motivated you to join the DONGOT initiative?	-	Reflection
	Q9:	What is your biggest achievement within the DONGOT initiative?	-	
	Q10:	What is your favorite activity?	-	
Close Questions	Q3:	Do you see yourself working as a teacher?	<input type="radio"/> Yes; <input type="radio"/> No; <input type="radio"/> I don't know.	Future and expectations
	Q4:	Do you see yourself as a researcher?	<input type="radio"/> Yes; <input type="radio"/> No; <input type="radio"/> I don't know.	
	Q13:	Does DONGOT encourage you to pursue a master's degree?	<input type="radio"/> Yes; <input type="radio"/> No; <input type="radio"/> I don't know.	
	Q6:	Do you manage to balance studies with DONGOT activities?	<input type="radio"/> Yes; <input type="radio"/> No; <input type="radio"/> Partly.	Reflection
	Q7:	What is the level of your motivation in DONGOT activities?	<input type="radio"/> High; <input type="radio"/> Medium; <input type="radio"/> Low.	
	Q12:	Does this initiative encourage you to invest more time in university activities?	<input type="radio"/> Yes; <input type="radio"/> No; <input type="radio"/> I don't know.	
	Q14:	What is your level of involvement in the activities?	<input type="radio"/> High; <input type="radio"/> Medium; <input type="radio"/> Low.	
	Q11:	Do you characterize the DONGOT initiative's effects as positive?	<input type="radio"/> Yes; <input type="radio"/> No; <input type="radio"/> I don't know.	Feedback

A similar questionnaire survey was sent to mentors too. Table 3 summarizes the questions and responses of mentors.

3. Results

The results of the questionnaire survey represent the perspective of students' and mentors' attitudes and experiences through the DONGOT program.

The questionnaire survey (see Table 2.) was completed by 12 students, and all 7 mentors (see Table 3., Fig. 3.). The main findings of closed questions are illustrated in Fig. 2. It was found that 7 students (58.33 %) imagine themselves working as teachers. On the other hand, only 33.33 % see themselves as researchers. Also, from open question Q1: *What kind of job position do you expect after graduation?* Responses were related to their major discipline, two participants still didn't know, and



only one respondent indicated teacher as a job position. It should be noted, that in responses to question Q2, the salary expectation varies from 900 to 3500 EUR/month. Seven respondents indicated that would like to earn at least 1500-2000 EUR/month after-tax deduction. This number indicates the median of all responses and it is reasonable in the context of Lithuania. For example, a junior assistant earns around 1200 EUR/month after-tax deduction and can also receive PhD scholarship (1045 EUR/month during the first year of studies, 1210 EUR/month during the second-fourth year of studies) [9], or/and be included in project activities in the context of Lithuania. However, it would be quite challenging to compete with the IT sector after graduation. For example, the Net monthly salary in the category of Information Technology varies from 1296 EUR/month to 3613 EUR/month \pm 10%. It should be noted, that salaries may vary by position, the value given is indicative [10].

The responses to question Q5: *What motivated you to join the DONGOT initiative?* The most common response was related to the lecturer (6 answers), and others' motives were: gaining knowledge and skills (3 answers), the ability to combine studies with work (2 answers), the desire to be a professional in a particular subject, and to feel what it means to be a teacher (1 answer). From the reflection question Q10: *What is your favorite activity?* The responses were related to teaching activities (5 answers), communication with faculty members, project activities, and practical assignments that allow to improve professional skills. It is very important to remember achievements through the DONGOT program (related question Q9.). However, 3 participants were not able to identify achievements, 3 responses were related to teaching experience, and others related to practical assignments. From the close-ended responses was identified that only 41.67 % of students have high motivation and only 16.67 % have high involvement levels in DONGOT activities (see Fig. 2, Q7, Q14). On the other hand, mentors were asked about their student's motivation (see Fig. 3. Q5), and only 2 mentors (28.57 %) agreed that they have highly motivated students. It should be noted, that these mentors have 5 students, so only 31.25% of students have high motivation according to the mentors' perspective.

Feedback and evaluation of the DONGOT initiative. Both participants' lecturers and students reported that the DONGOT initiative has a beneficial impact (see Fig. 2. Q11 and Fig. 3. Q10). It should be noted, that two mentors specified that the time was too early to assess the positive impact of the initiative. In response to question Q8: *What do you like about the DONGOT initiative?* students mentioned these positive aspects: communication with lecturers, additional training, interesting topics, getting to know the teacher's work environment, involvement of different people in common activities, etc. To question Q9: *What do you think about the DONGOT initiative?* mentors reported that the DONGOT initiative allows engaging students in faculty and university activities, to give insights that work at university might be various and interesting, etc. (see Fig. 3.). In addition, Q15: *What should be improved in the DONGOT initiative?* From the student's perspective, there were several reported aspects: more information about the DONGOT initiative, the creation of a community of DONGOT participants, and more various activities. From the mentor's perspective, the initiative needs to add team-building activities, peer-to-peer seminars, the possibility of students changing specialization fields, solving students' withdrawal problems, etc. (see Table 3. Q11).

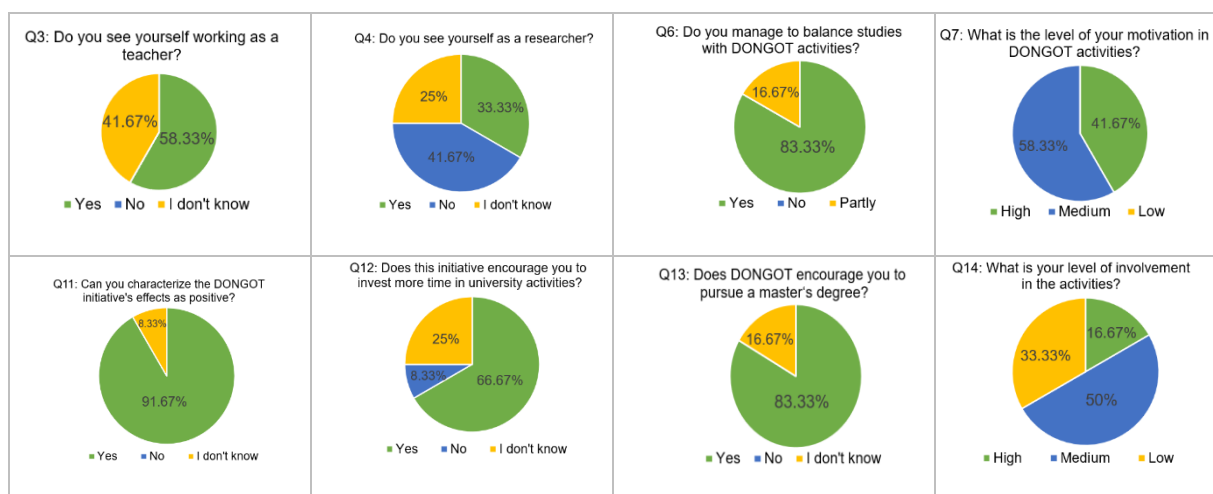


Fig. 2. Findings from the student's survey closed-ended questions



Table 3. The questionnaire survey and responses of mentors

		Questions:	Responses:
Open Questions	Q3:	What activities did you provide for DONGOT students?	<p>R1: Active involvement in department activities, theory elements of how to do the filming, and practical work.</p> <p>R2: 3D modeling assignments.</p> <p>R3 and R6: teaching practice, participation in „Dr. J.P. Kazickas Forum“. It should be noted, that this event is a programming contest.</p> <p>R4: Preparing a note/memo for students, developing an information system, upgrading laboratory work software, and testing new tools.</p> <p>R5: The students are working on a project, creating an applied virtual reality program, which they promise to present at the innovation exhibition „Technorama 2024“.</p> <p>R7: Work on scientific and non-scientific projects, and activities designed to represent the university.</p>
	Q4:	How do you manage to involve students in your proposed activities?	<p>R1: Sometimes I would like a little more involvement from the students.</p> <p>R2: On average, only active students do assignments. Maybe there is a little lack of communication, but it could be because of the study load.</p> <p>R3: I suppose it's not bad, as many invitations as there were, students have answered every summon.</p> <p>R4: One student went abroad, and I did not receive a callback. Another student engaged in the activities well.</p> <p>R5: Students work systematically and consistently</p> <p>R6: It's complicated, only 1 student participated from 3.</p> <p>R7: Students actively participate in activities.</p>
	Q7:	Please, list reasons why some students withdraw from the DONGOT initiative	The grouped responses were time management problems, personal reasons, missing team-building activities, lack of activities, and lack of additional scholarships.
	Q8:	What challenges do you face?	The grouped responses were time management problems, filling out reports, students not responding to emails, missing the sense of responsibility, and the lack of social skills, and uncertainties in the initiative.
	Q9:	What do you think about the DONGOT initiative?	All respondents provided positive feedback. The key points were that the DONGOT initiative allows engaging students in faculty and university activities, to give insights that work at university might be various and interesting. It is good that students are formally recognized and included in this initiative. However, at the beginning, the goals and expectations were not very clear.
	Q11:	What should be improved in the DONGOT initiative?	The grouped responses were to allow students to be more creative, team building activities, peer-to-peer seminars, the possibility to change subjects, solving students withdrawal problems, higher requirements for students, involving the mentors, greater clarity of the initiative, and what are expectations.

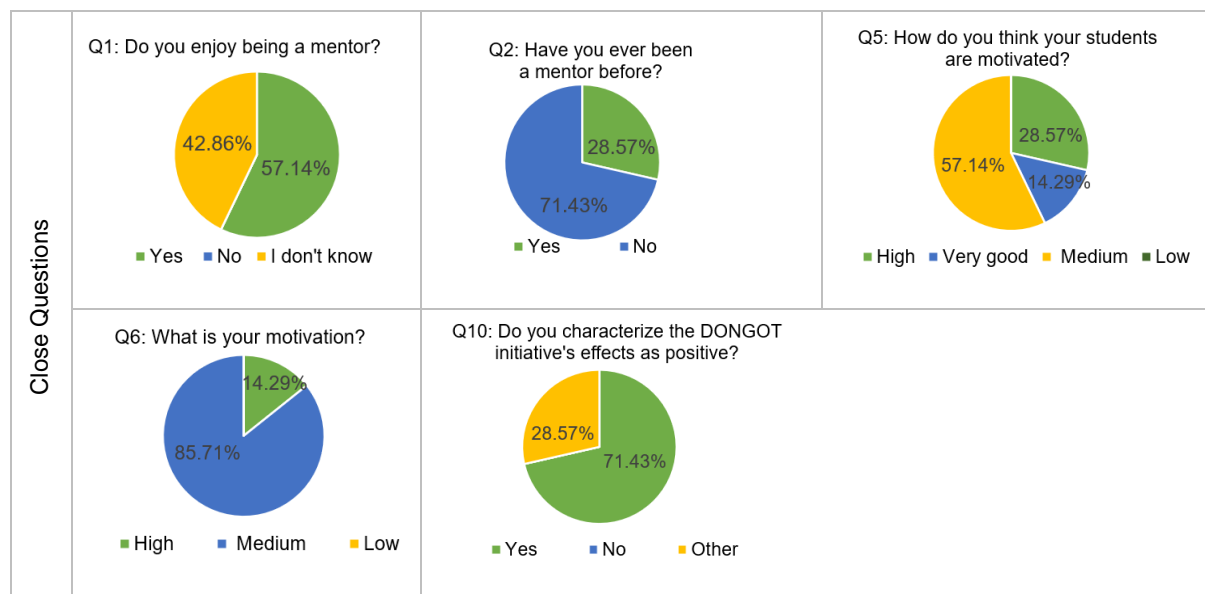


Fig. 3. Findings from the mentor's survey closed-ended questions

4. Conclusion

The findings of this pilot study suggested that the DONGOT initiative has a positive effect. It is intended to continue the DONGOT initiative with the first results expected in 5-10 years. One of the expected results might be the increased number of PhD students who work as lecturers.

However, there are several aspects of the DONGOT initiative that should be improved such as the dissemination of information about the DONGOT initiative, team-building activities, peer-to-peer seminars, creation of a platform where participants can communicate. Moreover, the majority of students and mentors described their motivation as medium. So, one of the future challenges will be to motivate students and mentors. In addition, students who have extrinsic motives such as a high salary expectation, should be informed in advance about the educational sector situation.

REFERENCES

- [1] U. Bergmark, S. Lundström, L. Manderstedt, and A. Palo, "Why become a teacher? Student teachers' perceptions of the teaching profession and motives for career choice," *European Journal of Teacher Education*, vol. 41, no. 3, pp. 266–281, May 2018, doi: 10.1080/02619768.2018.1448784.
- [2] A. Balyer and K. Özcan, "Choosing teaching profession as a career: Students' reasons," *International Education Studies*, vol. 7, no. 5, pp. 104–115, 2014, doi: 10.5539/ies.v7n5p104.
- [3] H. Zacher, C. W. Rudolph, T. Todorovic, and D. Ammann, "Academic career development: A review and research agenda," *J Vocat Behav*, vol. 110, no. October 2017, pp. 357–373, 2019, doi: 10.1016/j.jvb.2018.08.006.
- [4] PayLab, "Salaries by positions." Accessed: Mar. 20, 2024. [Online]. Available: <https://www.manoalga.lt/en/salaryinfo>
- [5] R. Suhandra and S. Ariawan, "EXPLORING EFL STUDENT TEACHERS' EXPERIENCES ON THE ROLES OF TEACHER MENTORS DURING TEACHING PRACTICUM," *JOLLT Journal of Languages and Language Teaching*, vol. 11, no. 4, pp. 901–911, 2023, doi: 10.33394/jollt.v%vi%i.8742.
- [6] F. Z. Tanjung, B. Musthafa, and Y. Wirza, "Voice of EFL Mentor Teachers: Mentorship for Mutual Professional Development," *Studies in English Language and Education*, vol. 8, no. 3, pp. 986–1005, 2021, doi: 10.24815/siele.v8i3.20401.
- [7] KTU, "Homepage URL." Accessed: Mar. 22, 2024. [Online]. Available: <https://fi.ktu.edu/>
- [8] Z. B. M. Ali, W. Wahi, and H. Yamat, "A Review of Teacher Coaching and Mentoring Approach," *International Journal of Academic Research in Business and Social Sciences*, vol. 8, no. 8, pp. 504–525, 2018, doi: 10.6007/ijarbss/v8-i8/4609.
- [9] KTU, "KTU Doctoral studies. Financial information." Accessed: May 20, 2024. [Online]. Available:



International Conference The Future of Education



https://admissions.ktu.edu/phd/?gad_source=1&gclid=Cj0KCQjw6auyBhDzARIsALIo6v9C92XrLlrZuz2pJ6GokDfVPgcMuKpUUWYcZsNV7TUA6VzPxWaD30aAlwdEALw_wcB#finansine-parama

- [10] PayLab, "Salaries in the category: Information Technology." Accessed: May 20, 2024. [Online]. Available: <https://www.manoalga.lt/en/salaryinfo/information-technology>