CHAPTER 4
THE TALLINN UNIVERSITY CASES, ESTONIA

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National Context for Teacher Research Literacy Policy

To become a teacher in Estonia, candidates must complete a specific educational and certification process. Teacher education in Estonia is designed to prepare professionals who can meet national educational standards and foster students' academic achievement, social-emotional development, and general competencies (Estonian Ministry of Education and Research, 2023). Teacher education is primarily offered at Tallinn University and the University of Tartu. Both universities offer various teacher education programmes, including those for early childhood educators, primary school teachers, subject teachers for middle and secondary school, vocational teachers, and specialists in special education. Early childhood education and vocational teachers complete a three-year bachelor's degree followed by a two-year master's programme. Primary school teachers undertake a five-year programme combining bachelor's and master's level studies with education as the major field. Middle and secondary school subject teachers complete a three-year bachelor's degree and an additional two- or three-year master's programme. These programmes are designed to provide the pedagogical knowledge and practical skills necessary for professional teaching practice. In addition to meeting the academic requirements, aspiring teachers in Estonia must complete a supervised teaching practice internship in schools or other educational settings. This practical experience enables them to apply their theoretical knowledge in real-world classroom situations under the guidance of experienced educators. The practical component is integral to the teacher education process in

Estonia, ensuring that graduates are well-prepared to engage effectively with students and navigate the complexities of the teaching profession.

The teacher education curriculum typically includes courses in pedagogy, teaching methods, educational psychology, classroom management, and basic research methods at both bachelor's and master's levels. At Tallinn University's School of Educational Sciences, bachelor's students are required to complete courses such as Basic Research Methods (6 ECTS) and Research Seminar (6 ECTS). At master's level, students take courses in Basic Research Methods (6 ECTS), followed by Qualitative and Quantitative Methods (6 ECTS) and a Master's Thesis Seminar (6 ECTS). The programme culminates in the preparation and defence of a master's thesis.

In Estonia, significant emphasis is placed on teachers' in-service training. Several policy documents highlight the importance of continuous professional development to ensure teachers remain updated on current educational practices (for example, Estonian Ministry of Education and Research, 2023). However, teachers have a lot of autonomy in selecting the topics and extent of their in-service training, as there are no compulsory requirements for completing a specific number of in-service training hours. In addition to rich learning experiences, in-service training often fosters collaboration and the exchange of ideas among educators, thereby creating a supportive professional community. For example, several university-led in-service training programmes adopt a whole-school approach or focus on building networks of teachers and school leaders across different institutions.

Many students enrolled in teacher education programmes at Tallinn University are already employed in schools. Balancing coursework with their teaching responsibilities can lead to a significant workload, requiring efficient time management skills and dedication. However, this dual role offers invaluable opportunities to apply newly acquired knowledge directly in the classroom. Moreover, the diversity among students in these programmes significantly enriches the learning environment. Students vary in age, life experience, and professional backgrounds, including a notable number of career changers. This diversity brings a wealth of perspectives to the educational discourse, fostering dynamic discussions and preparing future educators to meet the diverse needs of their students and communities.

After completing a teacher education programme at Tallinn University, graduates must obtain a teaching certificate. This certification requires passing a

professional qualification examination and meeting specific criteria (Estonian Qualifications Authority, 2024). The examination assesses pedagogical competence, subject knowledge, and teaching skills to ensure candidates meet the rigorous standards of the Estonian educational system. Research literacy is understood as a core component of teacher education, encompassing the ability to effectively engage with and utilise educational research in their professional practice. It includes skills for conducting action research to address challenges in one's own teaching, analysing students' learning processes, and planning their learning accordingly (Estonian Qualifications Authority, 2024).

The state uses an evidence-based approach to developing education policy, increasingly involving researchers in strategic decision-making. National policies strategically embed research literacy components within the curricular framework of teacher education programmes (OECD, 2020). This ensures the systematic development of prospective educators' abilities to critically engage with and apply educational research findings. Moreover, all upper-secondary school students must complete a research study or practical work as part of their studies, which often necessitates teachers taking on supervisory roles. This responsibility further challenges and strengthens their research literacy, contributing to a culture of continuous professional development and evidence-based practice within the Estonian education system.

Teaching Class: Quantitative Methods Seminar

Introduction to Case 1

The course *Qualitative and Quantitative Research Methods* (6 ECTS) is integrated into almost all master's programmes at the School of Educational Sciences, Tallinn University. Most MA students are already employed as teachers, youth workers, or school leaders. However, their academic backgrounds and research experience are rather diverse. Many hold a previous MA degree in another field, while others have little or no previous research experience.

The aims of the course are to:

- develop theoretical knowledge and practical skills required for critically understanding research results and for data collection and analysis in educational research.

- prepare students to conduct empirical qualitative and quantitative research in the educational field.
- foster the development of students as independent and ethical researchers.

Essentially, the course is designed to support MA students in their reading of scientific literature and conducting their own research. Its content is embedded into qualitative and quantitative methods, including data gathering and analysis. Initially, the course addresses the research process, its main goals, and the role of the researcher in both qualitative and quantitative paradigms. Next, students are introduced to the most common data collection methods used in educational research, with a focus on their strengths and limitations. Finally, the course covers basic techniques for qualitative and quantitative data analysis, followed by instructions for reporting research results.

The course uses a mixed teaching approach, tailored to the content of each seminar. Sessions typically combine lectures with small-group or whole-class discussions and practical data-related activities. Students create and conduct a practice interview, which is then subject to discussion and reflection during the seminar. They also design a data collection instrument for answering a research question requiring quantitative data. Data analysis instruments are introduced and discussed, and for hands-on practice, students use Jamovi for quantitative data and QCAMap for qualitative data.

Students are required to complete four independent tasks during the course:

- conduct qualitative data collection by carrying out an interview and providing a reflective analysis.
- perform a qualitative mini-research project to demonstrate theoretical knowledge and practical skills in analysing an educational phenomenon, applying a freely chosen qualitative data analysis method.
- design a data collection instrument to address a quantitative research question.
- analyse quantitative data and present the results according to the formatting guidelines for MA theses.

The seminar observed by TREL project colleagues focused on statistical association tests. It followed a seminar on critically reading quantitative data analysis results and preceded a seminar introducing the Jamovi software. Statistical association tests are taught in a step-by-step manner. First, students examine the results presented in a scientific paper and reflect on their

observations. Next, the idea and purpose of the association tests are introduced and discussed. Finally, students interpret the example results from additional research papers. In the following seminar, students are introduced to the Jamovi software and practice using a data file. At this stage, the focus is on exploring the programme's features rather than interpreting the results of the analyses. In the last seminar, these elements were integrated: the conceptual understanding of the association tests, the use of Jamovi as a tool, and the development of interpretation skills.

In the seminar observed by TREL colleagues, the session began with a review of the previous meeting. Students were asked to find and describe the descriptive statistics presented in the example paper. Next, the concept of statistical association tests was introduced. Students then completed the task of formulating independent and dependent variables from a given set and provided theoretical justifications for their choices. This task was designed to illustrate the necessity of theory-based hypotheses in quantitative research. The seminar began with a brief review of the previous session, with particular reference to the data types and the importance of selecting appropriate statistical tests for each analysis. Subsequently, the concepts of independent sample t-tests, analysis of variance, correlation, and regression analyses were introduced. Examples of research questions suitable for each method were discussed to illustrate their practical applications.

Feedback from observers

Students' engagement and interaction patterns

Observers noted that students seemed genuinely interested and actively engaged in the group tasks, with one observer remarking that they were "making meaning" of the concepts studied. However, the observers pointed out that the seminar tended to favour more active students, who asked questions and participated in the group discussions, thus leaving some students less involved. Additionally, observers highlighted the imbalance between student-led knowledge construction and teacher-directed discussion, noting that the seminar leaned more toward the latter.

Tasks and instructions

Observers discussed the level of simplification applied to the research results and the tasks designed to illustrate the research methods presented in the seminar.

Content

Observers emphasised the importance of highlighting a clear theoretical model and well-defined hypotheses before planning any quantitative data analysis. They also recommended integrating discussions of ethical considerations throughout the seminar.

Critical insights into practice based on feedback

Observers highlighted the specific content and depth of quantitative methods covered in the course, noting the challenge of determining the appropriate amount of preparation for students to effectively engage in thesis work and analyse their own data. It is crucial that the material remains accessible and understandable for all students. For example, factor analysis was excluded because it requires a broader understanding of psychological measurement. During the course development, an additional in-class seminar was introduced to familiarise students with the software used for data analysis. Furthermore, non-parametric tests are now only briefly mentioned, as combining parametric and non-parametric tools proved too confusing for most students.

We appreciate the observers' feedback on strengthening the link between the analyses taught in the course and their practical applications in teachers' and school leaders' everyday work. While this is challenging, it represents an important area for improvement in the course. To address this, we plan to add tasks that involve reading and understanding real-world educational data (for example, external school evaluation reports, students' state examination summaries, and students' individual development cards). These tasks will also include planning subsequent interventions, either in school or at student level, based on the insights gained from the data.

Introduction to Case 2

The observed research seminar aimed to provide participants with a comprehensive understanding of quantitative instruments and their application in research. Specifically, the seminar aimed to elucidate the conceptualisation and analysis of quantitative instruments, with a primary focus on planning and constructing questionnaires. The seminar was conducted in a hybrid format, with half of the students attending in person and the other half participating online.

Throughout the seminar, participants delved into key phases involved in questionnaire development, ranging from setting clear objectives to piloting the instrument for refinement. Emphasis was placed on feasibility considerations,

including factors such as time constraints, participant accessibility, and the estimated completion time for respondents. Additionally, discussions addressed the selection of appropriate platforms for administering the questionnaire and determining sample size to ensure statistical validity and representativeness of findings. Furthermore, the seminar explored the practical application of action research methodologies within the context of questionnaire construction and analysis. Participants also examined the constructs to be included in the questionnaire, evaluating the advantages of using ready-made instruments versus their own. They explored available resources such as databases and scholarly literature for questionnaire templates. The seminar underlined validity as a critical aspect in self-made questionnaires, underscoring the need for rigorous validation processes to ensure the reliability and accuracy of research findings. Furthermore, ethical considerations were woven in throughout the seminar discussions. Topics included the potential drawbacks of incorporating too many open-ended questions, the importance of clear writing and unambiguous questions to facilitate understanding, and the optimal sequence of questions to enhance survey coherence and respondent engagement. Additionally, concerns pertaining to participant confidentiality, informed consent, and responsible research conduct were thoroughly examined to uphold ethical standards in research practice.

The seminar participants consisted of seven master's-level students enrolled in a foreign language teacher programme. This cohort represented a spectrum of linguistic specialisations, including one German language teacher, one French language teacher, one Finnish language teacher, and four English language teachers. In addition to being students, all held positions as novice in-service teachers, bringing practical experience in language instruction. While they had encountered research methodologies during their undergraduate studies, this exposure was primarily limited to qualitative approaches. Consequently, statistical methods were relatively unfamiliar terrain for them.

The observed research seminar was closely linked with the preceding seminar on theoretical issues. Feedback was given on the designs students had prepared as homework, offering constructive insights for improvement. Drawing on past experiences, frequent references to previous sessions were made, thus setting the stage for a discussion and providing valuable context for the ongoing exploration of quantitative research methodologies.

Feedback from observers

Students' engagement and interaction patterns

The observers noted that the teacher employed a variety of strategies to engage students and deepen their understanding of the material. Short-response questions were predominantly used to initiate interaction, while follow-up questions encouraged deeper responses and fostered critical thinking skills. Furthermore, the use of controversial questions served to trigger discussions and challenge students' perspectives. As the discussion shifted towards students' work on questionnaires, the session became notably more interactive. Design principles were introduced using students' own examples, a strategy deemed effective in enhancing student responsiveness and attentiveness. Furthermore, reviewing assignments and draft items in relation to potential problems, possibilities, and analysis requirements proved to be an effective method to connect the lecture content to students' own research projects. This approach increased both the relevance and the meaningfulness of the session.

The teacher continuously demonstrated efforts to engage students throughout the class. She maintained direct and continuous eye contact to monitor student engagement. Adopting a Q&A format, the teacher highlighted practical information relevant to questionnaire development, while ensuring clear communication and addressing students' questions. Her approachable demeanour created a safe and supportive environment, encouraging students to inquire about various aspects of questionnaire construction and implementation. In addition to addressing practical questions, the teacher encouraged students to reflect on their own research experiences and used short scenarios to illustrate key concepts. By involving both onsite and online students in the discussion and fostering an argumentative approach, the teacher promoted critical thinking and deeper engagement.

Tasks and instructions

The teacher incorporated connections to previous classwork and utilised students' own work as discussion points, while maintaining realistic expectations for such projects. A notable aspect of the seminar was its emphasis on connecting the material to students' actual theses and their work with supervisors. This approach was commended for contextualising the material within the students' current academic endeavours and enhancing its practical relevance. Additionally, the discussion of students' assignments in relation to their research projects served to bridge theoretical concepts with real-world applications.

Content

The observers noted that the course was very informative, particularly regarding the use of questionnaires as a research tool, with students demonstrating attentiveness in both modalities – online and in the classroom. While only a subset of students actively engaged and participated verbally during the instructional process, it is possible that others were more knowledgeable about the topics or preferred to listen and learn from the teacher and more vocal peers. Additionally, some students may have been less comfortable expressing themselves in English, which could have influenced their level of verbal participation.

Critical insights into practice given the received feedback

The importance of addressing questionnaire design principles was highlighted as essential for enhancing students' comprehension of research literature. However, the complexity of guiding students through the process of designing their own questionnaires was acknowledged, considering the multitude of principles and details requiring careful attention. Despite this, engaging students in designing their own questionnaire was perceived as a beneficial and effective approach to developing questionnaire construction. Concerns were raised regarding the adequacy of time allotted for students to fulfil all requirements related to designing a questionnaire for their research.

While the course was commended for its student-friendly approach, it was noted that the teacher dominated most of the teaching time. The hybrid nature of the class posed challenges, with Zoom participants appearing less involved, which negatively impacted class discussions. Furthermore, only a select group of students actively participated, prompting consideration for strategies to promote richer student-to-student and teacher-student interactions. The teaching methodology predominantly relied on lecturing key issues, supplemented by practical questions, without assigning specific students to provide comments. It is recommended that students be given more time for reflection and peer discussion to process information at a slower pace. Additionally, the rarity of note-taking among students suggests that the course content might not have sufficiently challenged their prior knowledge, warranting adjustments to the instructional approach.

Reflective Comments for Both Cases

Improving students' research literacy remains a considerable challenge for higher education institutions. Achieving this goal requires a careful balance between making the content accessible and ensuring sufficient depth for students to develop a conceptual understanding of key topics. This is particularly crucial in teacher education, where instructional practices are grounded in data-driven decision-making. Teachers are expected to understand, critically reflect, and implement evidence from educational research (Prenger & Schildkamp, 2018). Moreover, teacher education emphasises learner-centred teaching methods: the same approaches we encourage our students to use in their future practice. These include constructing knowledge collaboratively, explaining concepts to peers, and merging these into the existing frameworks. Our course development efforts reflect this commitment. For example, both observed courses have since been redesigned to align with a student-centred approach, thus increasing hands-on activities and meeting the needs of students' individual research projects.

References

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