**Audit summary**

**Introduction**

The audit procedure was based on Akkerman et al. (2008), including four steps: orientation to the study, planning of the audit, the audit process, and writing the report. In the first step, the auditee provided reading materials to the auditor about the study and meet to explain the purpose of the study and the audit. In the second step, the auditee and auditor decided on the criteria, structure, and focus of the audit. We focused on three criteria (i.e., visibility, comprehensibility, and acceptability), which we translated to audit questions, and focused on the introduction and methods. We used a formative approach where intermediate discussions were held to improve the quality of the study. The third step was the audit process itself, where the auditee shared an audit trail including documents describing the steps taken and the justification of these steps. The auditor checked that each document contained enough information and was clear, and made comments on all documents, from clarification questions to suggestions for improvements. Conversations were held to discuss how to implement suggestions. In the fourth and last step, the auditor wrote the audit report. In this report, the study was evaluating according to the criteria.

**Criteria**

“That is, the main underlying question for the auditor is whether these results and conclusions are grounded in the process of data gathering and data analysis in a way that the auditee made linkages that are visible (visibility), substantiated (comprehensibility), and logically and scientifically acceptable (acceptability)… Acceptability means that the substantiation of a research decision follows the argumentative logic of the field, and connects to what is considered as known and not known in the research domain.” (Akkerman et al., 2008, p. 13)

We turned the criteria of visibility, comprehensibility and acceptability into a rubric with concrete indicators. We concluded that visibility should be achieved through the creation of the audit trail, and comprehensibility through the justification of all steps taken. Essentially, the process of the audit should achieve these two criteria, and we developed the questions below to guide this process. The existence of the audit report can be taken as confirmation that the criteria of visibility and comprehensibility were met. Acceptability is a value judgement on the part of the auditor, and needs qualifying. For the acceptability criterion, we developed the indicators below to quantify what acceptable quality means for each section of the research study. These were edited during the process, based on the purpose of the study and the purpose and timing of the audit.

**Audit questions and summary of results**

***Introduction***

* The choice of theoretical framework is logical.
* The research question is well defined.
* The research has the potential to contribute to the field (theoretical and/or practical relevance).
* Auditor’s comments are aspects auditee has considered
* Auditee responds satisfactorily to all comments (applies or justifies not applying comments)

The introduction section passes on all criteria. The research question is specific in its focus and uses terms defined in the introduction and theoretical framework. The research has the potential to contribute a new way of understanding generic skill development that may be useful for both teachers and researchers, and is part of an important trend in educational research of studying innovative educational design to see what students gain from this, creating new frameworks for assessing student learning around the data itself, and focussing students’ perceptions of their own learning. Through rounds of feedback, the auditor was able to observe the development of the theoretical framework, how concepts from the literature were chosen to best fit the purpose of the course the data was gathered from, and students’ experiences in this course. An important example is the use of the term “generic skills”, which was originally “domain-independent skills”, but this was changed in order to adhere to the current notions around skill development. This is a strength of the study: the complex theoretical framework is justified by the intent to explain process occurring in the learning process evoked by innovative course design. Comments made by the auditor during the process mostly focussed on justifying and linking concepts, most of which had been previously considered, and nearly all of which were applied.

***Method***

* Methods are logically chosen considering the theoretical framework.
* Methods are transparent and repeatable.
* Data collection is logical and convincing.
* Instrument is logical and convincing.
* Coding procedure is logical and convincing.
* Coding decisions are explained, and are consistent with procedure.
* Auditor’s comments are aspects auditee has considered.
* Auditee responds satisfactorily to all comments (applies or justifies not applying comments).

The method section passes on all criteria. We originally interpreted the idea of a repeatable method as meaning that the auditor should repeat the coding protocol. In the case of this study, with a complex, multi-step coding protocol, the research developed a more streamlined version for the auditor to use. However, this proved more difficult, and in the end the auditor used the original coding protocol to check the coding protocol, which was time-consuming and did not add much to the value of the audit. This was partly because, while we made similar coding decisions in many places, we also made many different coding decisions, but this could not be taken as evidence of the unreliability of the coding scheme, as the auditor was not a fully trained coder, and had coded reasonably quickly, with the idea of coding to rapidly check the protocol. We discussed differences in our opinions, which was useful for refining the coding procedure and descriptions in the paper. Discussing the coding was primarily a discussion about the definitions of the dimensions, for instance the difference between value and understanding, and value and progress.

A strength of this study is the use of existing data for analysis, which fits the intended audience of teachers seeking to use and assess innovative teaching methods. The instrument, a synthesis of relevant theoretical frameworks for coding student reflection reports, is complex but necessarily so, and the auditee added diagrams to illustrate the coding process and enable practitioners to understand the data analysis as well as the conclusions drawn.

During the process of auditing the coding protocol, most comments were related to accuracy of wording when defining dimensions, and indication words. The researcher applied all comments satisfactorily, which was easy as most were small. Overall, comments on the method had all been previously considered and were the result of conscious decisions made by the auditee and supervisors. Most comments were applied, and those that were not predominantly focused on key difficulties within the study, for which there was no easy answers. An example of this is the amount of data analysed, which was a small amount of the total amount of text in students’ learner reports. This was due to a desire on the part of the auditee to overcome her closeness to the material with a strict coding scheme. Using so little of the data might not be ideal, and could be improved by aligning the assessment description with what the researchers hope to find out, or explicitly instructing students to think about skills in terms of the dimensions mentioned. However, this runs the risk of coming too close to asking students to write what the researcher expects to see.

**Auditee response**

The audit procedure was both very insightful and lengthy at times. We chose the audit procedure because the framework is new, and we wanted to not only get insight in the quality of the process, but also to be able to improve the quality of the developed framework. The formative function really made an open discussion about the study possible and therefore helped to improve the study in ways that, I believe, other methods (like critical friends, or feedback sessions) won’t. Explaining decisions to someone outside of the study helped with my own understanding and with highlighting those aspects that were not as straightforward as I thought they were. This also made it tough at times. Looking back, I could have been more prepared for the audit as I found it difficult to really comprehend the content and extent of information an outsider (the auditor) needs, to understand the all the decisions that are made in a research project. I think, for instance, that my current, improved audit trail is more in line with what is needed, compared to the separate files that I started with. The many conversations and possible improvements felt daunting at times and shifts your perspective on where you are at in the process of the research. Although you need to be more or less finished with your research to be able to hold an audit, the formative nature resulted in many adjustments and improvements, meaning that the first product wasn’t finished at all.

**References**

Akkerman, S., Admiraal, W., Brekelmans, M., and Oost, H. (2008). Auditing quality of research in social sciences. Quality and Quantity 42, 257–274. doi: 10.1007/s11135-006-9044-4.