



## Lecturers' reflections on adaptive feedback in learning management systems as input for sustainable instruction design

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The necessity for digital content that is automated, flexible, and adaptable for every learner continues to expand. Learning management systems (LMS) are commonly used, but their potential to provide adaptive features for individualizing learning has seldom been didactically exploited to the desired extent. We approach this *research problem* focusing mainly on the relations between teachers and digital resources *theoretically* based on the Adaptive Learning Models Framework (ALMF) [Ma20]. This framework includes a learner model, a content model, and an instructional model. Our focus is on the learner and the content model, specifically on diverse feedback options. Opportunities and challenges with AF have been researched and systematically surveyed using different classification frameworks, models, and typologies [PL22]. AF may be embedded in the content model through AF generation engines: data-driven, expert-driven, and mixed. Feedback items that we built, are an integral part of the tasks in the Moodle question bank for quizzes which is structured in categories and sub-categories according to the requirements of curricular prototypes that are being currently tested.

The research work presented here is part an initial Design Research (DR) cycle that includes a literature review, theoretical grounding, conceptualization, and surveying teaching practices [DDS22] related to the *research question (RQ)*: to what extent have lecturers used AF in their teaching practices in curricular courses related to Corporate Finance in the last academic year (summer semester 2021 and winter semester 2021/22) at two faculties of HTW Berlin? The RQ refers not only to whether lecturers have provided feedback to the learners, but also what kind of feedback have they offered exactly, in what frequency (time and schedule), how and why, as previously grounded with the theoretical framework. The survey was anonymous and in compliance with the institutional data protection regulations. It incorporated 4 major parts: demographics, modules, competences, and study programs, and included closed and open questions. The sample

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involved 15 affiliated participants (71% response rate): 7 professors and 6 teaching assistants (2 persons did not share this data) from both faculties. The primary data were collected and evaluated in a database via an online instrument which were then analysed and compared with descriptive statistics. The *results* in connection to the RQ about the extent and variations of usage of AF show that feedback, both individual and collective, is mainly given orally or through handwritten correction on paper-version assignments. Interestingly, 8 participants, which is more than a half, have never used automated AF generated in Moodle Quizzes. Further, 6 participants never deliver feedback in Moodle Forum. These last two results seem critical and reveal plenty of possibilities for instructional design. To secure the *validity* and *reliability* of the collected data, a double check analysis was undertaken by looking at the data about the use of diverse activities in Moodle. These data clarify that the lecturers use both activities Forum and Quiz intensively (one third of the participants always for each of these two activities), but for purposes other than feedback. The option for direct Feedback through Moodle is never being used by 7 participants. Further, participants in the survey agreed on the importance of subject specific competences in financial mathematics as a prerequisite for developing competences in corporate finance. Based on these data, a pre-test with 8 tasks randomized in 4 content domains was created and implemented with 2 groups of students in 2 courses. Further group of the survey questions serve for design of other tasks: Multiple Choice Questions, Multiple True/False questions, open essay, numerical and drag-and-drop involving AF in new Moodle Quizzes, that can automatically be scaled with minor efforts and disseminated.

Although the sample size does not allow generalization, we may *conclude* that participants' lecturing practices with AF in LMS activities are not extensively rich and diverse enough. This indicates further implications for cyclic iterative instructional (re)design and research about its effectiveness on learning.

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## Bibliography

- [DDS22] Donevska-Todorova, A., Dziergwa, K., Simbeck, K. Individualizing Learning Pathways with Adaptive Learning Strategies: Design, Implementation and Scale. In Proceedings of the 14th International Conference on Computer Supported Education (CSEDU 2022), 2022.
- [Ma20] Martin, F., Chen, Y., Moore, R. L., Westine, C. D. Systematic review of adaptive learning research designs, context, strategies, and technologies from 2009 to 2018. Educational Technology Research and Development, 68(4), pp. 1903-1929, 2020.
- [PL22] Panadero, E., Lipnevich, A. A. A review of feedback models and typologies: Towards an integrative model of feedback elements. Educational Research Review, 35, 100416, 2022.