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Research Article

Learning in the Context of (Digital) University Teaching: Flexibilisation and Individualisation

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Abstract

This article explores the challenges and developmental landscapes of digital university education, focusing on fostering flexibility and individualization in learning. It examines how integrating online and in-person formats can serve these objectives and how evaluation techniques can enhance the quality of teaching offerings. The shift towards lifelong learning (LLL) and catering to individual student needs are regarded as pivotal concerns. The paper presents various developmental fields within higher education, emphasizing the need to cultivate a learner-centric culture that supports self-directed learning. The integration of online and in-person formats as part of a flexible teaching concept is discussed as a solution for individualizing and flexibilizing learning. Additionally, the evaluation of teaching as a quality measure is deliberated, emphasizing the importance of effective evaluation methodologies. The work concludes with a contemplation on the future of university education, advocating for a balanced blend of online and in-person formats. This strategy aims to foster flexibility and individualization in learning to meet the demands of self-directed and lifelong learning. The article notes that experiences from the pandemic should be integrated into future university teaching rather than reverting to previous norms. The open questions, particularly regarding the integration of AI applications like chatbots and their impact on instruction, are highlighted as pivotal for further developments in higher education.

Keywords

Flexibilisation of Learning, Individualisation of Learning, Digital University Teaching, Educational Technologies, Blended Learning, Lifelong Learning, Self-Directed Learning, Student Support

1. Introduction

The future of university teaching is currently the subject of much debate. The discourse is characterised, among other things, by what viable concepts for university teaching could look like. This article pursues the following question: How can the integration of online and face-to-face formats contribute to the flexibilisation and individualisation of university teaching in order to meet the requirements of lifelong learning (LLL) and how can this be effectively supported by suitable evaluation methods in order to achieve a leap in quality in university teaching? To answer these questions, an overview of currently discussed areas of development in (digital) higher education is first presented (chapter 2). The focus here is on the target vision of how (digital) higher education teaching should develop in order to be compatible with individual educational biographical requirements in the sense of LLL. In this context, the keywords of flexibilisation

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and individualisation can be found in the literature [1].

Chapter 3 shows that one solution to this may lie in the combination of online and face-to-face formats to promote the flexibilisation and individualisation of (digital) university teaching in the sense of a blended university [2]. In order to be able to assess this and to address the development field of the quality leap [3], the method of evaluation, which is presented using an example in chapter 4, is a suitable method. The article ends with the derivation of a thesis on the future of university teaching.

2. Development Fields of (Digital) University Teaching

In view of the rapid technological developments in the age of digitalisation, social changes and the diversity of students' life situations, higher education is called upon to help shape this change [4]. The development of higher education into an open institution that enables LLL as lifelong learning and should not only improve personal employment prospects [5], but is also important for the development of society [6]. In addition, all interested parties should be able to participate in academic education and educational disadvantage should be prevented [7, 8]. The German Council of Science and Humanities [3] defines several objectives for future-proof academic education and emphasises the central role of higher education in social change (cf. ibid.). The term (digital) higher education is therefore associated with participation, permeability and openness [9].

In addition to these specific objectives of (digital) higher education, there are a number of other general requirements. In principle, the university should enable self-determined and individualised learning [10], pursue a student-centred approach [11] and support the ability for self- direction [12]. The creation of a teaching- learning culture that is conducive to self-directed learning is one of the areas of development identified by the German Council of Science and Humanities [3] in order to promote the sustainable further development of (digital) higher education. This also includes developing a culture of discourse and reviewing the effectiveness of teaching in terms of quality assurance. Ultimately, the future of higher education lies in balancing face-to-face and digital formats and generating ideas for needs- orientated teaching/support [13]. This is based not only on the experience of the pandemic, but also on general technological developments.

In addition to the social and technological developments mentioned above, there are also developments in the student body. Students are in different life situations and have heterogeneous socio-demographic characteristics, while the demand for a university degree is increasing. At the same time, the range and use of digital teaching and learning formats is growing. There is also a ubiquitous availability of knowledge, educational content, educational materials and communication options. The use of learning tools and apps on various end devices in the sense of mobile learning as an extension of traditional digital learning according to de Witt & Sieber [14] is also changing the temporal and spatial structure of learning and leading to a decoupling of educational institutions and formal educational programmes.

At the same time, there is a demand on higher education institutions and (digital) higher education to adapt to student needs, so that a shift towards flexible and individualised formats and concepts seems sensible. In addition to the need for student-centred teaching to enable self-directed learning, there is also a need for learning support [15, 16]. This is an important success factor for learning [17-20]. Particularly in the context of digital learning, carers play a decisive role in shaping it [21]. In view of the heterogeneity of students, there is a need for flexible teaching-learning design [10]. Adapting this to the diversity of learners also implies a focus on the needs of (potential) students [15, 19]. However, there is still a deficit in focussing on student needs from the perspective of the students themselves with an emphasis on expert statements about students [22, 23].

Overall, it can be said that an integrative approach based on a flexible combination of different teaching-learning formats, through the flexible design of teaching and learning in conjunction with a possible individualisation of learning and its diverse possibilities, is the learning form of the future for higher education, as Agarwal [24] also emphasises. The notion of the "trained learner" that still existed in the 1960s [25] is obsolete. The focus is now on opening up universities, as well as the compatibility of life situations and personal development (cf. ibid.). The flexibility of the spatio-temporal organisation of studies within the framework of (digital) studies "plays a central role in the realisation of lifelong learning" [8]. Flexible learning means that LLL on demand and seamlessly, so that "the individual can (re)enter learning and educational processes at any stage of the acquisition and life cycle" [26], regardless of location, time, end device and adapted to learners, taking into account individual requirements and objectives.

However, self-direction is not only desired, but also required, as these processes must be orchestrated by the learner themselves and a variety of learning decisions must be made [27]: What is learnt when, where and with whom, how and for what purpose? Here, however, the question can be asked to what extent a high degree of self-direction is desirable and realisable for all learners, depending on their learning style, personal life situation, previous academic and professional experience, etc. In a study on learning needs in the context of distance learning as a form of education that requires a high degree of self-direction, the author came to the conclusion that students find themselves in a field of tension between their own requirements, learning needs and individual prerequisites as well as a simultaneous desire for orientation towards supervisors, framework conditions and curricular structures [23]. The description of student needs

did not reveal a homogeneous desire for student needs to be taken into account in the supervision of learning in a distance learning context. It can be concluded here that an individual focus should be set (cf. ibid.), not only in the supervision of students, but also in the design of university teaching, including possible formats and their combination.

3. Integrating Online and In-person Formats to Enhance Flexibility and Individualization in University Teaching

Understood as a combination of online and face-to-face learning in different facets and contexts [28] and recognised as an established model for "appropriate university teaching" [3], blended learning combines different (digital) teaching and learning formats. The term hybrid teaching is now also used to describe the combination of different formats, which has developed from the reorganisation of teaching and learning during the coronavirus pandemic and includes the coexistence of online and face-to-face formats. The terms "hybrid" and "blended" are often used interchangeably [29]. A classification of formats according to the degree of digitalisation in one dimension and the degree of flexibility of learning in the other dimension to determine teaching and learning with digital formats.

Zawacki-Richter & Stöter [30] analyse this in different combinations. By combining face-to-face and online formats, an attempt is made to combine the advantages of both formats [31]. The sole use of face-to-face formats is just as obsolete as online formats alone can often not sufficiently initiate educational processes (cf. ibid.). Blended learning can be understood as interlinked, combined or enriching. This involves not only a combination of face-to-face and online formats, but also a combination of different online and offline phases as well as different (activating) digital formats within a digital teaching-learning environment. One example of this is the concept of the inverted classroom as a preparation and input phase in offline self-study and a subsequent collaborative phase that takes up, discusses and reflects on content. Flexible concepts are therefore needed that allow a varying degree of flexibility (see model of digital higher education offer formats in Zawacki-Richter & Stöter [30], allow settings to be designed according to the target group and allow room for manoeuvre with regard to didactic decisions. For the implementation and design of flexible learning, this does not mean a judgement or decision in favour of one delivery format over the other, i.e. online or face-to-face, but rather an integrating format decision [3] depending on the intended objectives.

It is therefore a matter of didactic decisions on the design of blended learning or hybrid learning that enables flexible learning independent of time and place and thus meets the needs of the target group. The question now is how (digital) university teaching can be organised from the selective enrichment of classroom teaching with digital formats to integrated concepts. Digital formats should not be seen as an add-on, but rather as an integral part of teaching and learning. It is therefore about concepts of flexible learning that are also anchored in the curriculum at an institutional level beyond the individual course. This is because the original aim or intended advantage of blended learning is that its benefits should be combined [31]. Communication channels and opportunities should be created, exchange between the people (group) involved should be promoted, as should identification with the educational institution. In contrast, however, there are often challenges and barriers to realising these intended benefits in educational practice. Although the original aim of blended learning is to combine the benefits and create communication channels as well as promote exchange and identification with the educational institution (cf. ibid.), various obstacles can arise in reality. These include, for example, those involved in university teaching, who have to deal with different educational formats and concepts and should have the corresponding digital skills, which are often not used to advantage in educational practice [32].

Data protection issues also arise here in relation to the integration of blended formats, particularly with regard to the storage and protection of sensitive learning data and ensuring the privacy of learners and teachers. Obstacles are also conceivable in the form of technical problems and challenges in the integration of various digital teaching and learning tools as well as possible resistance on the part of teachers and students to the introduction of new technologies and teaching methods (keyword: acceptance).

Under the premise that the "use of e-learning and digital media could become a matter of course and establish a new normality in university teaching" [33], the question now arises as to the target vision: What should (digital) university teaching be like that sees the digital as the new normal (cf. ibid.)? This involves anchoring digital teaching-learning formats [34] that have emerged during the pandemic in the design of (digital) university teaching. From the teachers' perspective, the focus is on the added value associated with digital formats (cf. ibid.).

From the students' perspective, the added value of digital teaching is certainly recognised, but there is a wide variation in terms of the added value in relation to the proportion and scope of these elements, measured against the overall proportion of teaching [35].

However, the university of the future should not essentially focus on the question of what percentage of teaching takes place online or on campus. "A blended university should be geared towards the needs of its stakeholders in particular. For example, the key question in teaching should be how students can best be prepared for a digitalised working world in which future skills such as creativity, critical thinking, collaboration and communication play a key role"

[29]. The vision of the "blended university" outlines the transformation of universities towards a state in which teaching is neither exclusively digital nor exclusively face-to-face. However, it is conceivable that not all subject areas or educational levels could benefit equally from a mixture of face-to-face and online teaching. Therefore, the implementation of a blended university should be carefully planned and tailored to the specific needs and circumstances of each university.

4. Evaluation of (Digital) University Teaching

In view of the accelerated technological advances in the context of digitalisation and social changes as well as the heterogeneous student body, universities are increasingly being called upon to increase not only the quantity but also the quality of their educational offerings [3] and to further develop the quality of their offerings. The challenge here lies in a "leap in quality" against the background of the increased requirements (cf. ibid.) and objectives mentioned in chapter 2. Several levels are conceivable for defining a concept of quality, depending on the focus of a teaching- learning situation and its consideration.

The first question that arises at this point is what "good" higher education teaching is and what quality criteria can be determined for it. One criterion for the quality of higher education is the achievement of the objectives defined by the German Council of Science and Humanities [3], which should apply across all types of higher education institutions (generic): academic (scientific competences, acquisition and reflection of knowledge), labour market preparation (individual competence profiles), personal development (critical questioning and reflection of current developments). Beyond a general understanding of quality as a property or characteristic of something, the concept of quality in the context of higher education teaching is complex, as quality can be interpreted at different levels depending on the objectives and contexts. According to Arnold et al. [20], the levels of application orientation (support with (digital) media) and learning orientation (learner competences) as well as the learner perspective on teaching-learning settings serve this purpose. The respective individual background of experience and the respective starting situation (educational biography, prior knowledge, etc., keyword heterogeneity) play a role here.

A current examination of the quality of university teaching reveals an "increased demand for solid empirical findings" [36], but at the same time the existence of only a few "well-established findings on effective teaching in higher education" (ibid.). Numerous (methodological) problems are cited as reasons for this, including a lack of criteria for determining quality, a lack of specificity (validity of the criteria for which target group, contextual conditions, etc.) and sampling problems (too few participants or positive selection through voluntary participation) (cf. Ibid.).

To measure quality with the aim of further developing higher education, evaluation is used as a qualitative assessment of teaching and learning, often as a teaching evaluation. Different evaluation objectives are possible. The objective of an evaluation is decisive for the formation of criteria and the evaluation measures derived from them. An evaluation can, for example, focus on the achievement of learning objectives, learning effectiveness or the transfer of acquired competences, but these must first be defined in the objectives and the intended effects [37].

However, universities are faced with the challenge of enabling a large number of students with different qualifications to study at university [3]. Due to the increased demand for higher education, there is an increasing problem, especially in degree programmes with a high number of students, that the ratio of students to lecturers is becoming unfavourable and individual support for students is hardly possible (cf. Ibid.).

In order to achieve individualised higher education for learners with simultaneous support for supervisors against the background of increasing student numbers, the use of educational technologies represents an innovative approach [38], for example the use of intelligent chatbots for individual support [39, 40]. One example of balancing face-to-face and digital formats (chapter 2) is the BMBF-funded tech4compKI project. The aim of this project is to support the acquisition of skills with the help of AI and, among other things, to address self-directed learning. As part of an educational science module at the University of Leipzig (teacher training programme), students are provided with a digital learning interface in the Moodle learning management system, the so-called Mentoring Workbench, in addition to the classroom courses. In addition to a search function for browsing learning materials, this also offers visualisations of students' own artefacts to help them encounter and organise their own knowledge and promote reflection. This support service offers students the opportunity to engage flexibly with study content and at the same time provides a form of mental support. This is realised through a chatbot that guides students through the offer and provides individual feedback based on submitted task solutions.

Even if there is now a consensus, also fuelled by the coronavirus pandemic, that the digital transformation of education offers opportunities for the development of new teaching and learning formats, there are also challenges associated with digital teaching and learning scenarios [41]. Although these arouse curiosity and are certainly considered useful, there are still deficits in the perception of the personal benefits and the opportunity to use these technologies (also with regard to the respective socio-cultural background) (cf. ibid.) - which speaks in favour of AI didactics still to be developed - with regard to the integration of corresponding systems into the teaching-learning scenario. In addition, the acceptance and benefits of new technologies

play an important role [34]. Despite the advantages outlined, there are by no means only those in favour of using online formats and technologies. In a quantitative survey of lecturers and students in the 2020 coronavirus semester, the authors came to the conclusion that respondents in the post-coronavirus phase were in favour of a return to face-to-face teaching, especially lecturers. These results were strongly influenced by the previous experience of the participants and the information policy of their universities [35].

A more differentiated picture emerges from another survey, w h i c h recorded acceptance specifically related to AI technologies in a general assessment. The results indicated that although the students surveyed certainly see an opportunity in the technologies in question and attribute support potential to them, the majority still have little experience with them. In addition, students tend to use technology-supported services in the context of a course - and mostly for exam preparation [41]. The descriptive dimensions here are attitude, use, usefulness and usability (cf. ibid.). Implications drawn from the study concern increasing the perception and awareness of the use and utilisation of corresponding technologies as well as addressing motivational aspects in dealing with them (cf. ibid.). In addition to previous experience, the expectation of effort or the attitude towards the use of technology can also be considered for the survey of acceptance-moderating variables (cf. ibid.). These study results could also be replicated to a large extent in the results of the teaching evaluation in the BMBF-funded tech4compKI project in the winter semester 2022/2023 at Leipzig University. The students' responses in the open-ended format of an explorative qualitative questionnaire correspond to the findings made by Stützer [41].

5. Summary and Conclusion

In summary, it can be stated that, in view of technological and social developments as well as the numerous demands on university teaching, there is a need to make (digital) university teaching more flexible and individualised in order to meet the requirements of LLL and take into account the individual needs of students. One solution to this could be the combination of online and classroom formats or an integrating combination of different teaching-learning formats to organise (digital) university teaching. The integration of digital formats should not be seen as an add- on, but as an integral part of teaching and learning. A teaching-learning culture that enables self-directed learning and the evaluation of quality assurance are important aspects for the further development of sustainable (digital) higher education.

The following hypothesis can be derived with regard to the "future of university teaching": In the future, a combination of online and face-to-face formats will be increasingly used at universities in order to promote individualisation and to promote the flexibilisation of higher education and thus better meet the requirements of students with regard to self-directed and LLL. In the future, this means a post-corona era that incorporates the experiences of the pandemic, understood as a caesura [42], into the design of higher education teaching instead of reverting to the status quo ante. This thesis can be understood as a plea for a combination of online and face-to-face formats with the aim of making (digital) university teaching more flexible and individualised. For further research and development of (digital) university teaching, concrete case studies and practical examples could help to analyse the effectiveness of the principles discussed for the further development of digital university teaching. In addition, the ongoing integration of new (educational) technologies and interdisciplinary approaches represents an opportunity to develop innovative and, above all, target group-orientated solutions for the growing challenges in higher education. Last but not least, questions arise regarding the integration of AI applications, such as the currently much-discussed large language models, language models such as ChatGPT, and their effects on students' written coursework, examination formats, text generation and also ethical and data protection aspects. These developments offer both opportunities and challenges, including the possibility of adapting didactic scenarios or questions regarding the role definition of AI in the form of chatbots, prompt engineering, etc. [43].

Dealing with the open questions that arise (and which are also addressed in this article) can help to continuously develop (digital) higher education and adapt it to the needs of learners.

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Conflicts of Interest

The authors declare no conflicts of interest.

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