

## ORIGINAL RESEARCH ARTICLE

# The rise of private distance universities: a text-mining analysis of student satisfaction through the lens of self-determination theory

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Private universities are increasingly shaping the global higher education landscape, with distance education playing a key role in their expansion. While research has explored institutional and policy factors influencing private higher education, the role of student satisfaction within this framework remains underexamined. This study addresses this gap by analysing the success factors of private distance universities from a student perspective. Utilising text mining on over 10,000 student reviews from a public rating platform, a co-occurrence network analysis identified key themes linked to student satisfaction. The findings reveal that private distance universities successfully fulfil the core psychological needs of autonomy, competence, and relatedness, as outlined in Self-Determination Theory. Flexible study structures, accessible digital learning environments, and effective student support systems emerged as crucial factors. These insights align with international research, emphasising that distance education facilitates self-directed learning but requires robust institutional support to foster competence and engagement. This study contributes to the field of higher education and distance learning research by demonstrating the impact of technology-enhanced learning environments on student satisfaction. It calls for comparative studies between private and public distance universities, underscoring the need for longitudinal analyses of evolving student expectations and digital education models in a global context.

**Keywords:** private universities; distance education; self-determination theory; text-mining; student satisfaction

## Introduction

Private universities are becoming increasingly substantial in global higher education. According to the International Finance Corporation (IFC), private higher education institutions enrol 60% of students in Latin America and nearly 50% in Asia (IFC, 2021). In Europe, where state-funded universities continue to dominate, private universities account for almost 20% of enrolments. Despite disparities, a key driver of the global expansion of private higher education has been the rise of distance education. In the US, for example, 88% of the students who exclusively took distance education

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courses were enrolled at private for-profit institutions (National Center for Education Statistics, 2023). Digital learning environments, online degree programmes, and flexible study structures have enabled private universities to widen access to higher education, particularly for non-traditional learners. The IFC has invested over 3.1 billion USD in education projects since 2000, impacting more than 600,000 students in 2022 alone, underscoring the increasing reliance on private institutions to meet global demand (IFC, 2022). This study aims to contribute to the broader international discussion on private universities and the role of distance education.

However, it must be recognised that the boundaries between public and private distance education are not rigid. A growing number of hybrid models, particularly public–private partnerships (PPPs), combine the credentials and institutional frameworks of public universities with the technological infrastructure and student services provided by private organisations (Sajida & Kusumasari, 2023). Such collaborations enable the delivery of accredited online degree programmes by public institutions while drawing on private-sector expertise. These models illustrate how private actors shape the landscape of distance education, extending beyond the formal boundaries of private universities.

In Germany, private universities have traditionally been perceived as a niche phenomenon (Brockhoff, 2011). However, their growth has significantly accelerated over the past decade, now accounting for 13% of all students (Hachmeister, 2025). A notable example is IU Internationale Hochschule, which has surpassed FernUniversität in Hagen to become Germany’s largest university, enrolling nearly 117,000 students in 2023 (Hachmeister, 2025). Concurrently, distance education has expanded, now accounting for 8% of total student enrolments (Hüsch, 2024). These trends are interrelated: private universities offer 69% of the 1,006 available distance learning programmes in Germany, and 30% of students at private institutions are enrolled in online degree programmes (Hüsch, 2024; Kroher et al., 2023). The COVID-19 pandemic and an increasing demand for flexible, technology-enhanced learning models have further reinforced this trend (Zawacki-Richter, 2021).

Despite their growing significance, private universities and distance education remain largely underexplored in higher education research (Khondkar & Muzareba, 2024; Levy, 2024). This research gap extends beyond Germany, reflecting a broader lack of systematic studies on student experiences in private distance education. Therefore, this study aims to address this gap by focusing on a critical factor underlying the success of private distance universities: student satisfaction. Understanding student perspectives provides insights into why individuals opt for distance education over traditional on-campus programmes and how institutions can improve their learning environments.

The study operates on the premise that student satisfaction is a key driver of enrolment growth at private universities, particularly in distance education. While existing studies predominantly attribute the success of private universities to institutional and policy factors (Levy, 2024), this study places the student experience at the centre of its analysis. By analysing the success factors of private distance universities from a student perspective, this study also contributes to broader debates on the future of online and hybrid education models.

To summarise, the following research question is investigated: What factors contribute to student satisfaction at private distance education universities?

The analysis is framed by Self-Determination Theory (SDT), which posits that fulfilling three psychological needs – autonomy, competence, and relatedness – is essential for student motivation and engagement. By employing text mining and co-occurrence network analysis, the study examines over 10,000 student reviews from

a public rating platform spanning the years 2015–2024.<sup>1</sup> The identified thematic clusters are interpreted through the SDT framework, linking student experiences to the fulfilment of these core psychological needs.

The article is structured as follows: Section 2 provides an overview of the research on private universities and distance education. Section 3 introduces SDT and its operationalisation in this study. Section 4 outlines the case selection, data corpus, and methodology. Section 5 presents the results, and Section 6 discusses the findings in relation to the literature, offering an outlook for future research.

## **Literature review**

The importance of private universities in higher education is growing, yet systematic research on their success factors remains limited (Levy, 2024). While some studies have explored student satisfaction and institutional performance in private higher education, private distance universities remain particularly under-researched. Given the increasing role of distance education in private university expansion, there is a need to understand how student experiences in these institutions differ from traditional higher education models.

Existing research on private universities highlights multiple factors that influence student satisfaction. Venkateswarlu et al. (2020) found that faculty expertise, digital infrastructure, and institutional reputation were key factors, though students also reported concerns over tuition costs. Similarly, Leonnard (2023) examined service quality in private universities in Indonesia, emphasising the growing influence of digital support systems on student experiences. Research from Pakistan suggests that institutional governance and leadership impact students' satisfaction with private universities (Arif et al., 2013).

Despite their rapid growth, research on private universities remains scarce in Germany (Philipps, 2024). Vianden and Yakaboski (2017) analysed student satisfaction at German universities, identifying faculty-student interactions, academic quality, and administrative services as primary factors. However, research comparing private and public distance universities or analysing long-term student satisfaction trends in private institutions remains lacking.

While private distance universities have not been extensively studied, research on online learning within private institutions provides relevant insights. Nhan et al. (2022) examined student satisfaction in private universities during the COVID-19 pandemic, finding that flexibility, instructional support, and digital learning environments were critical. This aligns with broader distance education research, which shows that autonomy, perceived learning effectiveness, and access to support services strongly influence satisfaction in online programmes (Chiu, 2022; Hsu et al., 2019).

From a global perspective, private universities are significant providers of distance education in regions where public institutions are unable to meet demand. Distance education is a key strategy for increasing access in Latin America, where over 60% of students are enrolled in private universities (Levy, 2024). In Southeast Asia, private universities are expanding blended and fully online programmes to reach non-traditional learners (Tilak, 2025). However, in Western Europe, public

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<sup>1</sup> All data used in this study derive from publicly accessible, anonymous review texts on Fernstudiumcheck.de. No personal data were collected or processed, and no original content was copied or reproduced. The data were used exclusively for non-commercial scientific analysis in line with General Data Protection Regulation (GDPR) and §51 UrhG: German Copyright Act (Urheberrechtsgesetz) (scientific use).

universities continue to dominate online education, while private institutions play a more marginal role (Levy, 2018).

To summarise, despite growing relevance, systematic research on the success factors of private distance universities remains limited. Understanding the determinants of student satisfaction in these institutions is essential for higher education research, policymaking, and institutional development.

### **Theoretical perspective**

This study employs SDT as proposed by Deci and Ryan (2000) as an interpretive framework. SDT is widely applied in educational research to scrutinise learner motivation and the factors that either foster or impede motivation, satisfaction, and academic success. According to Deci and Ryan (2000), three psychological needs influence motivation and individual behaviour, thus affecting personal development and well-being: autonomy, competence, and relatedness. These can be described in relation to student satisfaction as follows:

1. Autonomy refers to the need for self-determination and independence. Students feel satisfied when they can make their own decisions and act according to their values, thereby gaining control over their learning activities.
2. Competence represents the inherent desire of learners to perceive themselves as capable and effective. They seek opportunities to successfully apply their skills, overcome challenges, and experience a sense of competence.
3. Relatedness involves establishing meaningful relationships with fellow students and instructors, fostering a sense of belonging, and feeling understood and supported.

Depending on how these needs are supported or impeded, different types of motivation develop, leading to varying degrees of self-determination. SDT differentiates between two main types of motivation (Ryan & Deci, 2020): intrinsic and extrinsic. Intrinsic motivation arises from an internal drive to engage in an activity for the inherent joy and satisfaction it yields. In contrast, extrinsic motivation is driven by external goals, such as obtaining a certificate, and is reinforced by external incentives such as rewards or punishments. Intrinsic motivation enhances engagement in learning and is a crucial predictor of academic success. According to SDT, intrinsic motivation and self-determination increase when the three psychological needs are fulfilled (Ryan & Deci, 2020). Therefore, (distance) universities can promote satisfaction, intrinsic motivation, and academic success by creating study conditions that enable experiences of autonomy, competence, and relatedness. Empirical research supports the hypothesis that self-determination has a positive influence on learning motivation and satisfaction (Chiu, 2022; Luo et al., 2021).

In this study, SDT serves as an interpretative framework for analysing the results of the quantitative text-mining analysis. This approach helps identify factors that enhance student motivation and satisfaction, ultimately contributing to their academic success at private distance-learning universities. The underlying assumption is that satisfied students experience a high degree of autonomy, competence, and relatedness in their distance learning programmes.

Based on prior research on distance education and online learning, it can be inferred that distance universities need to address the fundamental needs of self-determination differently compared to traditional on-campus universities, with educational

technologies playing a pivotal role in this process (Otto, 2018; Zawacki-Richter, 2021). Recent studies applying SDT confirm that fulfilling these three psychological needs is particularly important for successful online and distance education learning (Chiu, 2022; Luo et al., 2021).

It can be expected that the need for autonomy is more readily satisfied in distance learning due to its greater emphasis on self-directed learning processes (Luo et al., 2021). Conversely, the conditions of distance education may make it more challenging for students to encounter competence (Garrison et al., 2010). Therefore, it is crucial to examine how competence can be fostered through specific support structures during the online and self-study phases (Fojtik, 2018). A similar challenge arises for the need for relatedness, which encompasses interaction with faculty and peers. It is reasonable to propose that digital media play a central role in fostering relatedness (Otto, 2018).

Based on SDT, an analytical framework is proposed for evaluating the empirical data, allowing an assessment of the extent to which study conditions enable students to satisfy their fundamental psychological needs (autonomy, competence, and relatedness) and thereby enhance their intrinsic motivation and academic success.

### **Research design**

From a research methodological perspective, the availability of suitable and sufficiently representative data poses a challenge. While many private universities publish the results of their own surveys on their websites or in institutional publication series, these often fail to meet methodological requirements fully or have not undergone external review. To address the issue of data availability and acquire a representative sample of secondary data, this study utilises web scraping and text mining to extract and analyse student reviews from the publicly accessible online review platform FernstudiumCheck.

With the rise of public review platforms, customer reviews have become a significant source of data for research, as they provide access to a vast quantity of authentic information (Lee et al., 2021). Student review corpora have already been employed to investigate learning experiences and student satisfaction (Deng & Benckendorff, 2021; Wang et al., 2021). Technologies such as web scraping and text mining enable the compilation of extensive text corpora from customer review platforms, facilitating exploratory analyses (Hassani et al., 2020). Consequently, text mining serves as an important alternative and complement to qualitative research, which is often limited by the relatively small datasets available, depending on the research subject. Moreover, text mining reduces potential bias introduced by researchers during the analysis process (Deng & Benckendorff, 2021).

### **Case selection**

According to its own description, the FernstudiumCheck review platform helps prospective students to select an appropriate distance learning institution by providing student experience reports. The platform focuses exclusively on distance learning programmes and institutions. Established in 2008, FernstudiumCheck reports more than 350,000 visitors and 85,000 users per month. Over 390 distance learning providers are registered, with more than 85,000 reviews available.

All students enrolled at a distance learning institution are eligible to review their programme anonymously. The platform verifies the legitimacy of the reviews and may request proof of student status, such as an enrolment certificate, if irregularities are detected. Consequently, while a certain proportion of self-reviews by institutions cannot be entirely ruled out, the likelihood of significant distortions is low, especially in large datasets. Moreover, reviews that violate the participation guidelines are excluded from consideration by the platform. Thus, in 2023, 7.82% of the reviews submitted were removed for this reason.

Students can evaluate their study programme using a five-star rating system (1–5) across nine categories: study content, study materials, student support, online campus, seminars, digital learning, flexibility, value for money, and overall impression. In addition to categorical ratings, students can provide qualitative experience reports that outline the advantages and disadvantages. The review concludes with a recommendation in the form of a yes-or-no vote.

Unlike the standardised star rating system, free-text responses allow students to highlight individual experiences and determine their own evaluation criteria. These texts reveal the factors that are particularly significant to students and are well-suited for analysing study experiences through the lens of SDT.

The 2024 ranking is based on all 14,020 reviews for distance learning universities published in 2023. It is composed of a specific score of three key criteria: star ratings, recommendation rates, and the number of student reviews. Each of the three criteria can be rated with a maximum of 5 points, which allows a maximum possible total score of 15 points. To qualify for inclusion in the ranking, the platform sets the following criteria that institutions must fulfil: they must have received at least 50 reviews in 2023, have a minimum star rating of 3.75, and have a recommendation rate of at least 90%.

All 11 institutions that fulfil the three criteria of the platform and were thus listed in the 2024 ranking are private providers. The largest public distance learning institution, the FernUniversität in Hagen, did not meet the inclusion criteria. Although the star rating was 3.9, the recommendation rate was only 86%.

For the analysis of student reviews, the three top-ranked distance learning institutions in the FernstudiumCheck award ‘Most Popular Distance Learning Institution 2024’ ranking were selected: SRH University of Applied Sciences (SRH Hochschule), Euro-FH University of Applied Sciences (Europäische Fernhochschule Hamburg), and IST University of Management (IST Hochschule für Management). These institutions achieved scores ranging from 14.30 to 14.43 (see Table 1). The fact that all three institutions have consistently been ranked among the top five since 2018 indicates consistently high ratings. In 2023, their student populations ranged between 5,000 and 10,000 (Statistisches Bundesamt, 2024). Limiting the selection to the three highest-rated institutions allows for the hypothesis that the dataset is generally positively connotated, thereby enabling insights into the conditions for student satisfaction.

### ***Data corpus***

The dataset was compiled from student reviews covering the period from January 2015 to January 2024, during which time the number of students at private universities nearly doubled (Philipps, 2024). While this growth indicates an overall increase in student numbers, the expansion of private universities was disproportionately significant. In the winter semester of 2001/2002, only 1.6% of all students in Germany

Table 1. Analytical framework according to SDT.

Need	Analytical criteria	Literature
Autonomy	Degree of control over the learning path Flexibility in time management Opportunities for independent decision-making regarding learning activities	Lacka et al. (2021) and Lee et al. (2015)
Competence	Ability to effectively complete learning tasks Clarity and comprehensibility of learning materials Availability of learning resources and support services for competence development	Garrison et al. (2010)
Relatedness	Frequency and quality of peer interactions Helpful communication and feedback from faculty Sense of belonging within the learning community	Alvarez et al. (2009) and Vuopala et al. (2016)

SDT: Self-Determination Theory.

were enrolled at private universities, whereas by 2023/2024, this figure had risen to 13% (Hachmeister, 2025). The selected study period ensures a sufficiently large dataset, comprising over 3,000 texts per institution and a total of 10,345 texts (see Table 2), minimising distortions such as those caused by the COVID-19 pandemic.

The data were collected using web scraping, an automated method for extracting information from the internet. Specialised software crawls websites and retrieves relevant data (Mitchell, 2018). Libraries were employed to analyse HyperText Markup Language (HTML) pages and extract the necessary information. Scripts were developed to navigate website pagination and systematically gather all relevant data, ensuring full automation. These scripts were configured to automatically retrieve the required webpages, extract data, and store it in a predefined format (Comma-Separated Values [CSV files]), thereby reducing human error in data collection.

The extracted data include all student review texts, alongside star ratings, recommendation rates, and the number of experience reports per institution. A total of 232 review texts lacking a recommendation vote were removed to prevent distortions in the student satisfaction variable. The final cleaned corpus comprises 10,345 texts, totalling 64,347 sentences.

### ***Ethical considerations***

The data corpus was generated through automated web scraping of publicly accessible student reviews published on Fernstudiumcheck.de. All reviews analysed were freely available without registration, behind no paywall or login, and contained no personally identifiable information. Only textual content was retrieved; usernames, timestamps, or institutional metadata were excluded. The dataset was anonymised and processed exclusively at an aggregated level using co-occurrence analysis techniques. No original reviews were reproduced or quoted in full. The study adheres to the principle of non-intrusiveness and complies with the GDPR, as no personal data was collected or stored. The analytical procedure qualifies as a form of transformative, non-commercial scientific use. No institutional ethics approval was required due to the non-personal and publicly available nature of the data; however, the legal and ethical dimensions of web-based data use were critically assessed throughout the research process.

Table 2. The top three distance learning institutions on *FernstudiumCheck*.

Institution	Reviews 2015–2024	Average star rating	Recommendation rate	Platform score (maximum 15)	Students (2023/24)
SRH	3,068	4.53	98	14.43	4,633
Euro-FH	3,489	4.46	98	14.36	10,034
IST	3,788	4.4	98	14.30	8,743
Total	10,345				

### Data analysis methodology

Large text corpora such as the one analysed in this study are no longer feasible for manual qualitative analysis. Modern computational linguistic techniques in text mining support the semantic analysis of large text datasets by automatically or semi-automatically structuring them (Hassani et al., 2020). These methods enable the exploratory identification of patterns within corpora, making them a valuable alternative to traditional approaches where topics are predefined and analyses are directed accordingly (Spitzmüller & Warnke, 2011).

The dataset was pre-processed using lemmatisation for the German language in the KH Coder software before conducting a co-occurrence network analysis. A stop-word list was created (Higuchi, 2016) to exclude irrelevant words, such as articles (the, a), common auxiliary verbs (to be, to have), and highly frequent non-substantive words. Lemmatisation reduces words to their lexical root form, ensuring accurate frequency calculations (Segev, 2022).

Co-occurrence networks identify the dominant themes in student reviews, offering insights into the experiences of over 10,000 students at private distance learning institutions. The analysis is exploratory and unbiased by prior assumptions, distinguishing it from semantic network analyses, which focus only on predefined keywords (Segev, 2022).

A co-occurrence network analysis based on the Jaccard coefficient was conducted, as it effectively identifies closely related subgroups within large text corpora (Deshanta Ibnugraha et al., 2018). The results were categorised thematically and compared across the three institutions in relation to the three basic needs postulated by SDT.

### Findings

To identify recurring themes in student satisfaction across the three private distance universities, co-occurrence networks were generated using the 60 most significant word pairings per corpus (Figures 1–3). The resulting graphs visualise lexical proximity via co-occurrence coefficients, with higher numbers indicating stronger semantic associations (e.g.  $\geq 0.10$ ). Nodes are grouped into coloured subgraphs representing clusters of thematically related terms. The circle sizes reflect word frequency, providing insight into the salience of individual concepts within student narratives.

Despite institutional differences, all three networks exhibit similar thematic structures centred on flexibility, feedback, content quality, and usability. These clusters were interpreted through the lens of SDT, which posits that autonomy, competence, and relatedness are essential for learner motivation (Deci & Ryan, 2000).

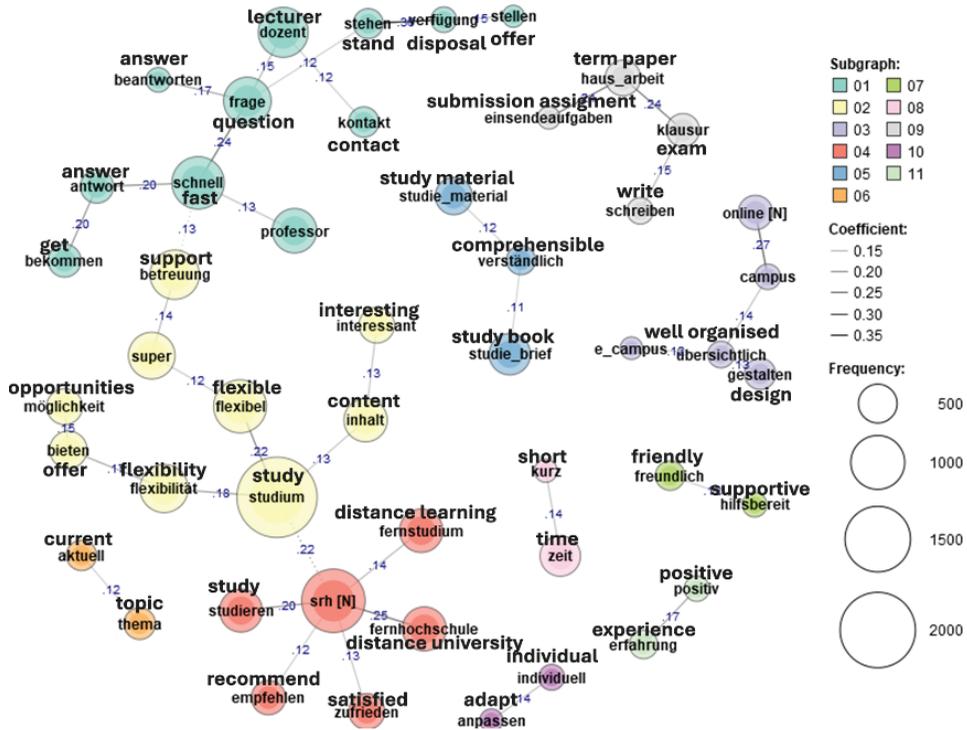


Figure 1. Co-occurrence network analysis for the SRH University of Applied Science.

**Autonomy: flexibility and choice**

All three institutions demonstrate lexical patterns consistent with autonomy support. At Euro-FH (Figure 1), a prominent subgraph 2 includes flexibility, study, offer, and opportunities, with flexibility–study programme forming a tie at 0.08. The high frequency of study programme (large node) highlights its centrality in student experience. Co-occurrences between offer–flexibility (0.09) and offer–opportunities (0.07) indicate that students associate institutional structure with freedom of choice.

At IST (Figure 2), autonomy is reflected in subgraphs 6 and 8. Six contains a strong lexical connection between flexible and study (0.09), complemented by terms such as dual, which signal modular or dual-study formats. Eight offer links to flexibility (0.17) and opportunities (0.13), indicating that students experience real choice within programme design.

At SRH (Figure 3), autonomy is expressed in subgraph 2, where study co-occurs with flexible (0.22) and flexibility (0.19). Adjacent links between individual and adapt (0.14) and flexibility–adapt (0.13) in subgraph 10 suggest that students perceive their programmes as adaptable to individual needs – an expression of volition consistent with SDT.

**Competence: clarity, feedback, and responsiveness**

All networks show lexical structures indicating competence support. At SRH, subgraph 5 connects comprehensible with study material (0.12) and study book (0.11). The proximity of interesting and content (0.13) suggests a combination of cognitive accessibility and engagement.

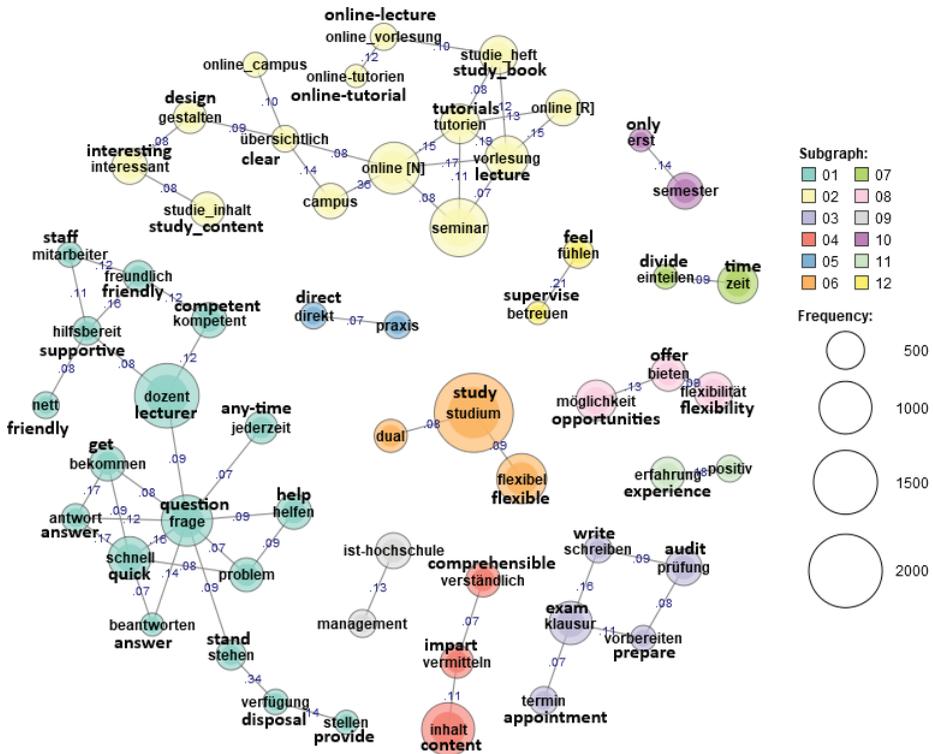


Figure 2. Co-occurrence network analysis for the IST university.

At Euro-FH, competence is reflected in subgraph 3, connecting study material with comprehensible (0.09) and study book (0.07). The co-occurrences indicate ease of use and clarity in materials. Similarly, IST exhibits competence-related terms in subgraphs 4 and 3. Firstly, the red cluster connects comprehensible, content, and impart (0.11), with nearby terms such as IST university and management adding institutional context. Secondly, subgraph 3 links write with exam (0.16), audit (0.09), and prepare (0.11). This structure reflects a well-defined and supportive assessment framework that aligns with SDT’s competence dimension.

Feedback also supports competence. At Euro-FH, subgraph 1 includes feedback, quick, and answer, with quick–answer (0.08) and answer–get (0.12) pointing to timely responses. The term question is large and central, indicating high salience in the corpus.

At IST, feedback is expressed through subgraph 1. Strong lexical links appear between question–answer (0.12) and question–quick (0.16), with get–answer at 0.17. Supplementary terms such as any-time, help, and support complete the structure, suggesting a high degree of availability and responsiveness. At SRH, similar structures emerge with feedback, quick, and answer. Support is tied together, with fast at 0.13 and with super at 0.14.

**Relatedness: interaction and presence**

Although distance education may limit spontaneous social interaction, all three institutions demonstrate evidence of relatedness through lexical clusters. At Euro-FH,

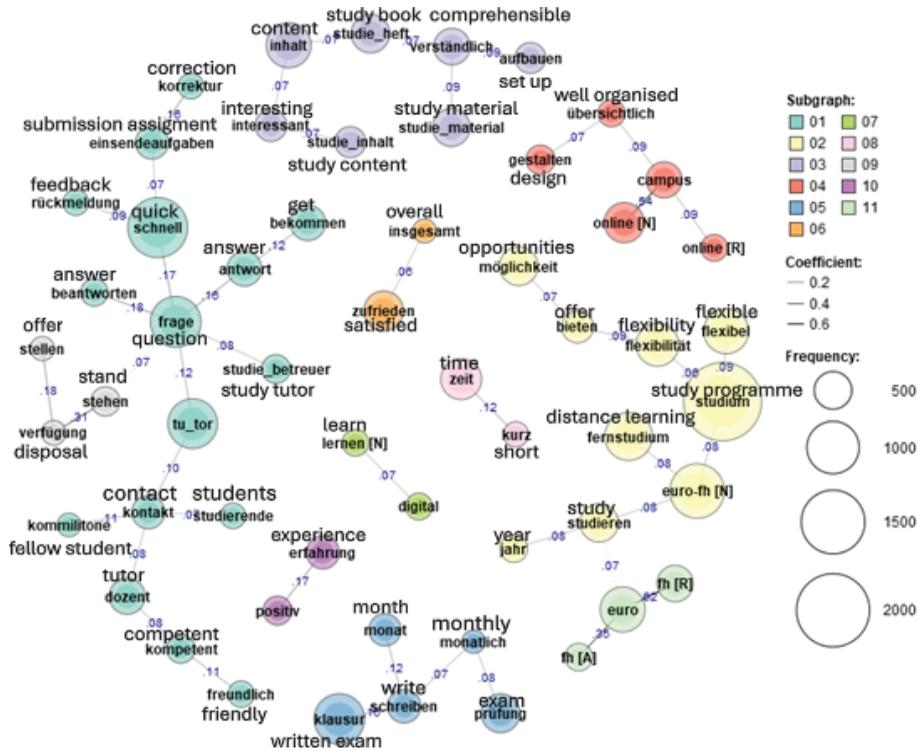


Figure 3. Co-occurrence network analysis for the Euro-FH.

friendly co-occurs with competent (0.11) while tutor–competent (0.08) and contact–students (0.10) point to meaningful academic relationships (subgraph 1). At IST, relatedness is represented by the subgraph 1. Here, staff is closely connected with friendly (0.12), competent (0.12), and supportive (0.16), while lecturer form ties with competent (0.12). These terms express recognition of academic presence, further supported by helpful and nice, which reflect the emotional tone of interactions. Compared to the other institutions, the density and size of these nodes indicate that students value consistent and personable staff interaction.

At SRH, subgraph 7 shows links between friendly and supportive, while subgraph 1 repeats the feedback–answer–support structure. This reflects a sense of connection that is communicated through availability and responsiveness rather than peer-based interaction.

Across all three networks, SDT needs are not expressed in isolation but as interwoven experience profiles. Feedback, for example, supports competence (task guidance), autonomy (self-regulation), and relatedness (interaction quality). Similarly, study is repeatedly embedded in clusters that combine motivational, affective, and structural aspects, especially at SRH where it co-occurs with recommend, satisfied, and flexibility.

Table 3 summarises the thematic mappings across institutions with SDT needs.

In summary, the co-occurrence networks suggest that private distance universities in this study support all three SDT needs. Word frequency and network centrality indicate that flexibility, feedback, and study serve as motivational anchors.

Table 3. Themes of the clusters in relation to SDT.

Cluster theme / Study experience	SDT need
Flexibility of study programme	Autonomy
Interesting and comprehensible study materials	Competence
Institutional choice (offer, opportunity, dual studies)	Autonomy
Study materials (clear, comprehensible, structured)	Competence
Feedback (quick answers, helpful, accessible staff)	Competence, Autonomy, Relatedness
Digital learning environment (online campus, tutorials)	Competence, Autonomy
Staff engagement (supportive, competent, friendly)	Relatedness
Organisational structure (exam preparation, schedule)	Competence, Autonomy
Individualised structure and adaptability	Autonomy
Emotional tone (positive experience, recommend, satisfied)	Relatedness, Autonomy

SDT: Self-Determination Theory.

The triangulation of thematic clusters, lexical ties, and SDT interpretation offers a structured account of how learners articulate satisfaction with core psychological needs.

## Discussion

This study confirms that student satisfaction in private distance universities is closely linked to the fulfilment of basic psychological needs, especially autonomy and competence. While these needs are well established in the literature (Chiu, 2022; Hsu et al., 2019; Luo et al., 2021), the contribution of this study lies in its focus on how such needs are addressed through specific technological and organisational practices in private distance institutions.

Unlike many studies that explore distance education in public contexts, this analysis draws on over 10,000 reviews of fully online, degree-level programmes offered by private German universities. These include bachelor's and master's courses in fields such as business, education, and social sciences, typically delivered asynchronously with optional synchronous support. The data thus reflect long-term, accredited educational formats rather than short-term professional courses.

Previous studies have suggested that private institutions may differ from public providers in terms of responsiveness and service orientation (Zawacki-Richter & Jung, 2023). Our findings seem to reflect similar tendencies. Notably, students frequently highlighted personalised communication, rapid feedback, and intuitive digital platforms. These are not merely indicators of quality, but operationalisations of SDT principles: flexibility becomes a proxy for autonomy; clarity and structure signal competence support; and responsive interaction fosters relatedness (Martin et al., 2018). While public institutions increasingly adopt digital formats, they often lack the service orientation and platform agility observed in private universities (Zawacki-Richter, 2023).

From a design perspective, the findings underline the need for configurable learning environments that allow self-paced progress and modular planning. Private providers frequently employ such designs as default, often supported by commercial learning management systems (LMS) with integrated analytics, which allow tutors to intervene early and personalise support (Zawacki-Richter, 2023). These technologies

are not neutral delivery tools but are embedded in organisational cultures that emphasise responsiveness and efficiency.

Additionally, this study offers policy implications. Recent research suggests that private higher education institutions often benefit from leaner governance structures and greater institutional agility, facilitating the implementation of student-centred technologies (Lucero et al., 2021). Conversely, while public institutions are often embedded in broader academic traditions and pedagogical mandates, their governance structures and funding constraints may limit their ability to experiment with student-centred instructional design at scale (Valdés et al., 2021).

In contrast, the private distance universities analysed in this study appear more successful in aligning core elements of the student experience – such as flexibility, personalised feedback, and platform usability – with the principles of psychological need support as outlined in SDT. Their course designs are not necessarily more innovative in pedagogical terms, but more consistent in addressing user experience and motivational factors. This alignment, often missing in traditional e-learning platforms, represents a distinct success factor with direct relevance for EdTech developers, policymakers, and institutional designers.

Ultimately, by connecting large-scale student voices with established psychological theory, this study helps to bridge the gap between abstract design principles and actual learner experiences in private online and distance higher education. It responds to calls for more user-centred evaluations of educational technology (Chiu, 2022) and provides a foundation for comparative research across institutional types.

## **Conclusion and outlook**

Private higher education is gaining importance (Levy, 2018, 2024), a trend also evident in Germany, where the proportion of students enrolled in private universities has increased substantially over the past decade (Philipps, 2024). Distance education has been a major driver of this expansion, benefiting disproportionately from the growing demand for flexible, technology-mediated learning environments. The acceleration of digitalisation and the flexibilisation of education, reinforced by the COVID-19 pandemic, along with changing student preferences regarding work-life balance and study modalities, are likely to bolster this trend further (Zawacki-Richter, 2021; Zawacki-Richter & Naidu, 2016). However, the rise of private distance universities has yet to be systematically examined in the field of higher education research. This study argues that student satisfaction with distance learning models could be a key factor in explaining this expansion. Building on this premise, the study examined the success factors of private distance universities from a student perspective by analysing student reviews from an online rating platform through text mining and a co-occurrence network analysis.

The findings demonstrate that the three highest-rated distance universities in the 2024 ranking effectively address the three fundamental needs of SDT, which are essential for student satisfaction and motivation. The identified thematic clusters suggest that distance learning institutions succeed in providing students with autonomy and flexibility. This aligns with decades of research in distance education, which has shown that self-paced, student-centred learning drives satisfaction and persistence in online education (Luo et al., 2021; Zawacki-Richter, 2021). Furthermore, the study provides evidence that the institutions create study conditions that enable students to perceive themselves as competent, a crucial factor in retention and academic success

(Garrison et al., 2010). The results further indicate that these universities have successfully implemented accessible and effective digital technologies, facilitating seamless learning experiences that are critical for student engagement in online and distance education (Chiu, 2022; Muzammil et al., 2020). Additionally, all three institutions foster a sense of relatedness through prompt, competent, and friendly communication with faculty and administrative staff, an aspect acknowledged as a challenge in distance learning environments (Chiu, 2022).

Globally, these findings reflect international trends in the expansion of distance learning. Research highlights the central role of private distance universities in meeting rising demand, especially where state-funded institutions fall short (Levy, 2024). Studies confirm that technological infrastructure, faculty engagement, and institutional support are key to student satisfaction in private distance education (Arif et al., 2013; Leonard, 2023; Tilak, 2025; Venkateswarlu et al., 2020). Research also suggests that learner autonomy and self-directed learning strategies play a crucial role in engagement and success in online learning environments (Vonderwell & Zachariah, 2005).

Regarding the robustness of the study, it is noteworthy that it is based on a large corpus of student reviews retrieved from a public rating platform. While the platform implements verification procedures and removes reviews that violate participation guidelines (e.g. 7.82% of submissions were excluded in 2023), the possibility of institutional self-reviews or strategically biased entries cannot be entirely ruled out. Although the large dataset size and the platform's moderation mechanisms help mitigate the risk of systematic distortion, this limitation must be acknowledged. In addition, the study includes only three institutions, which may limit the generalisability of findings. Moreover, as an exploratory method for analysing large datasets, text mining primarily serves to systematise patterns rather than provide in-depth qualitative insights. Lastly, sample bias remains a potential concern due to the self-selective nature of online reviews (Wang et al., 2025). This suggests a need for further empirical work to expand the institutional sample and triangulate the results through interviews or focus groups with current and former students.

Future research should also examine how private providers operationalise autonomy, competence, and relatedness in varying regulatory contexts and student populations. Comparative studies between public and private institutions may clarify which structural and organisational conditions foster sustained motivation and engagement in online learning environments (Zawacki-Richter & Naidu, 2016). In addition, longitudinal research is necessary to investigate how student satisfaction evolves over time, particularly in response to platform innovations, demographic changes, and institutional transformations (Selwyn, 2019; Xu & Jaggars, 2014).

While this study was conducted in the German context, the observed patterns resonate with broader international developments, especially the increasing demand for modular, digital, and personalised higher education (Levy, 2018; Marginson, 2016). However, given the substantial regional variation in regulatory regimes and institutional mandates, additional research is needed to assess whether the design elements identified here – such as digital accessibility, feedback culture, and curricular flexibility – represent more generalisable success factors. Advancing a more granular understanding of how institutional design intersects with students' psychological needs will be essential for adapting digital higher education to emerging challenges, including declining enrolment trends, the diversification of learner profiles, and the integration of AI-driven tools.

Another area for research concerns hybrid educational models. Public–private partnerships have emerged that combine public accreditation with private-sector platform management, digital infrastructure, and student services. These arrangements often reflect the design logics observed in private distance universities, such as modular study formats, personalised feedback, and digitally mediated learning environments. The SDT-based framework developed in this study may therefore also serve as a conceptual tool for analysing student motivation and satisfaction in such hybrid contexts. A key question is whether and how institutional hybridity affects the fulfilment of psychological needs in comparison to fully private or fully public provision.

### Data availability

The data are available upon request from the authors.

### Conflict of interest and funding

No conflict of interest. This study received no funding.

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