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# The Use of Podcasts as a Learning Activity During a Year 5 Competency-Based Blended Learning Curriculum at Saarland University

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**Abstract**

(1) Podcasts are increasingly used in undergraduate medical education. They differ from traditional learning activities and may influence exam performance. Podcasts also offer insights into learning behaviour and perceptions of family medicine (FM). Despite their frequent use in medical education, it remains unclear how they can best be integrated into competency-based curricula and motivate students to study for FM. This study examines the impact of a medical podcast on learning behaviour and academic performance at Saarland University (UdS). (2) This exploratory mixed-methods study analyzed podcast-related learning behaviour and exam relevance among year-five medical students at UdS in the winter semester 2024/25. Demographic, quantitative, and qualitative data were collected via an online questionnaire (Google Forms®) in January 2025. Data were descriptively and analytically evaluated and linked to exam results. Qualitative data were analyzed using Kuckartz's content analysis. (3) Of 123 eligible students, 92 participated. Most listened to episodes in full. Podcasts were seen as low-threshold means to access study content, but they were often not perceived as a separate learning activity. Listening to podcasts did not directly influence exam performance but helped connecting theory with clinical relevance and increased motivation for FM. (4) Podcasts are popular for exploring clinical practice and complex topics. Their didactic value lies in contextual learning and career orientation, rather than improving exam performance.

**Keywords:** clinical competence; competency-based education; podcasts; curriculum; education; family medicine; modern learning; medical education; medical students; motivation

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## 1. Introduction

Podcasts have experienced increasing public interest in recent years [1–6]. Traditional learning activities (LAs) (such as books) are increasingly being replaced [1,7]. At the same time, podcasts have become more important, not only for everyday life, but also as a new type of LA [1,7]. For educators planning future curricula it is important to understand how students use new LAs.

Scientific publications have painted a clear picture on the ideal podcast design [2,8–10]. The literature suggests a podcast should not last longer than 30 min, depending on the goal and content, in order to not lose listeners [2,8,9]. In most cases, a dialogue is more engaging than a monologue [2,8,9]. Listeners appreciate the integration of interactive content such as games or quizzes [2,8–10]. These elements help to achieve higher retention and engagement rates and to improve future podcast designs to suit students' learning needs [11,12].

The number of available entertainment and educational podcasts is constantly increasing [7,10–12]. Five well-known podcasts for medical students were analyzed in 2020 regarding several important features [11]. Such overviews may help educators or students when designing podcasts or studying with podcasts [11]. Even if some knowledge on structure and podcast design is available, it is important to also focus on the consumption side of podcasts [2,3,10]. It remains unclear how podcasts as a LA could be optimally integrated into specific undergraduate curricula, and how this is perceived or accepted by students [1,3,8,11].

From a theoretical perspective, self-determination theory highlights autonomy, competence, and relatedness as key psychological needs that foster intrinsic motivation in learning contexts [13,14]. In medical education, LAs that support these needs are more likely to sustain engagement and promote deeper learning [14,15]. This perspective has therefore been increasingly applied to digital and multimodal learning environments, including podcasts [15]. It can be argued that this also applies to new LAs that are integrated in modern competency-based learning curricula. As a different use implies different learning behaviour, this in turn may mean that the student perspectives need to be made visible to educators [15]. This theoretical framework is also reflected in recent educational initiatives at Saarland University (UdS), where competence-based family medicine (FM) curricula have been shown to foster students' intrinsic motivation and interest in pursuing FM careers [5].

In medical education, new LAs will need to be tested in different settings to guarantee their applicability in a variety of settings. In this case the structured implementation of podcasts as a LA in an undergraduate FM curriculum is being analyzed. This exploratory study aims to gain descriptive insights into how podcasts are consumed and used in practice in undergraduate medical education. It characterizes podcast consumption and learning behaviour among year-five medical students in a curriculum-integrated FM podcast at UdS. This study also compares the perceived educational value, and the actual academic performance value in comparison to measurable consumption metrics. In a second step, it also records perceptions on the motivational effect and the influence on professional identity formation (career choice/perception).

Rather than providing a universal model of podcast integration, it offers evidence on how students perceive and use curriculum-integrated podcasts in FM. These insights help educators plan and apply podcasts meaningfully in curricular redesign projects.

## 2. Materials and Methods

### *2.1. Settings*

Recruitment took place during the winter semester 2024/2025. Inclusion criteria comprised enrolment in the fifth year of the undergraduate medical programme, completion of the FM curriculum, eligibility for the corresponding examination, and provision of written informed consent. Students not fulfilling these criteria were excluded. Participation was voluntary and conducted under pseudonymized conditions; data were fully anonymized upon completion of data collection. The study adhered to the principles outlined in the Declaration of Helsinki. Ethical approval was obtained on 22 March 2023 (reference number: Bu 234/20).

### *2.2. Study Design*

In this mixed methods study, participants completed an online survey at the end of the FM curriculum, during the exam preparation period from 1 to 29 January 2025, ending on the FM exam date. The questionnaire was individually designed following a research triangulation session at UdS inspired by previous evaluation data, involving all

authors and held on 28 December 2025. The questionnaire included four demographic items (age, gender, first state exam grade, and study duration), 16 quantitative items and four qualitative items on podcast use and learning behaviour. The qualitative items were developed and discussed on 19 December 2024 at a qualitative workshop at UdS involving the authors and qualitative research experts. The wording, content, and suitability for the study objectives were discussed in detail to ensure comprehensibility, relevance, and methodological rigour before distribution to the students. This process served as content validation for the qualitative items. Adaptive logic enabled follow-up questions based on prior responses. Response rates per item varied due to item dependence and voluntary participation. For more transparency and response rates per item, see "Supplementary Materials".

### *2.3. Quantitative Data Analysis*

Data was processed in Microsoft Excel® (version 2411) and analyzed in Jamovi® (version 2.6.16). For small samples, the Fisher exact test was used instead of the Chi-square test. The Wilcoxon rank test analyzed non-parametric paired data. Shapiro–Wilk was used to test for normality. The post hoc Wilcoxon test followed the Friedman test to compare individual multitasking activities while listening (e.g., driving). Holm correction was applied to adjust for multiple testing. Partial Spearman correlations controlled for confounding variables.

### *2.4. Qualitative Data Analysis*

Qualitative data were analyzed via Kuckartz's content analysis. Independent coding by PV, FD, and NW was compared and discussed on 10 February 2025. Coding was conducted in Microsoft Excel® (version 2411). An investigator triangulation session took place on 15 February 2025 to increase the qualitative credibility of codes. Agreed upon codes where then combined to themes until saturation was reached. Iterative data analysis, based on emerged themes was performed to provide qualitative dependability, while at the same time maintaining a flexible and open approach to newly emerging codes (emergent research design).

### *2.5. Pedagogic Implementation of the Podcast*

The German podcast "Krankheitsbilder der Allgemeinmedizin-Zentrum Allgemeinmedizin, Universität des Saarlandes" (English: Disease patterns in FM—Department of FM, UdS) was integrated into the year-five FM curriculum [4,5]. The curriculum is based on Ryan and Deci's self-determination theory, combining elements that support autonomy, relatedness, and perceived competence gain with the aim to foster internalization of motivation. The curriculum received the GMA (Society for Medical Education) project award for best medical education project in Germany, Switzerland, and Austria in 2021.

The podcast adds to the curricular structure of lectures, online learning material, and simulation-based seminars. The podcast contains four series with four episodes each.

Episodes last 10 to 36 min and were published on various platforms. Students were explicitly informed that all materials provided, including the podcasts, were relevant for the exam.

Besides the podcast, lectures, and simulation-based seminars, there were several formative LAs available, such as repetitive testing.

In German undergraduate education multiple-choice formats and repetitive testing are the most common exam type and exam preparation format [16–18]. The online learning material went beyond that stage, also offering short videos, practical elements on prescription or referrals, or on antibiotic stewardship in primary care.

## 3. Results

### 3.1. Study Population

In total, 92 of 123 eligible students completed the questionnaire in January 2025. The mean age was 26.2 years (range 21–34); 72.2% were female, 27.8% male. A majority of 67.8% were on track to complete the degree within the standard timeframe.

### 3.2. Analysis of Listening Behaviour

In total, 46 out of 90 study participants (SPs) (51.1%;) listened to the podcast, 33.3% (30/90 SP) knew it was a recommended LA but never listened to it, and 15,6% (14/90 SPs) did not know it exists. Most of those who listened to the podcast (67.4%; 31/46 SPs), completed entire episodes in one go, others listened selectively: 2.2% (1/46 SPs) for <5 min, 15.2% (7/46 SPs) for 5–10 min, 10.9% (1/46 SPs) for 10–15 min, and 4.3% (2/46 SPs) for >15 min. Among those who listened selectively, 61.1% (11/18 SPs) preferred the middle part of the podcast, 27.78% (5/18 SPs) the introduction, and 11.11% (2/18 SPs) the closing remarks at the end.

The main reason (multiple answers possible) for not listening to the whole podcast series was perceived **time loss** (72.7%; 8/11 SPs). Some SPs described episodes as "too long" (qualQ 4, SP 44) and preferred "the most substantial parts" (qualQ 4, SP 43), e.g., the middle part. A minority of 9.1% (1/11 SPs) mentioned **concentration deficiency**: SPs "lose focus too quickly [during ongoing] audio recordings" (qualQ 4, SP 47). Varying **learning approaches** (18.2%; 2%, 11 SPs) also influenced the use of podcasts. Several SPs use the podcast "to get an idea of [the topic]" (qualQ 4, SP 60). Others self-identified as "visual learner[s]" (qualQ 4, SP 56) and therefore opted not to listen to the podcast.

Significantly more SPs (73.9%; 34/46 SPs) listened to the podcast while multitasking (Binomial test, $p = 0.002$). Among self-identified multitaskers, the most frequent parallel activities were driving (20.55%; 15/73) and cleaning (23.29%; 17/73), using public transportation (21.92%; 16/73), walking (19.18%, 14/73), and exercising (10.96%; 8/73). After Holm Correction, the differences between walking, driving, public transportation (all $p\_adj = 0.005$) and cleaning ($p\_adj = 0.021$) were significantly more common than other activities. Cooking and reviewing lecture notes were significant after the Chi-square test, but not after Holm correction (all $p\_adj = 0.068$). Exercising ($p = 0.316$) and lab work ($p = 0.660$) were not significantly more common.

### 3.3. Analysis of Learning Behaviour

This section focuses on students' actual learning behaviours when using podcasts, such as frequency of listening, multitasking patterns, and integration into daily study routines. SPs reported a weekly average of 18.44 h of additional self-directed study time; 34.4% (31/90 SPs) study 10–19 h/week in general; 5.6% (5/90 SPs) >40 h/week besides curricular LAs.

For FM, 86.5% (77/89 SPs) studied <10 h/week. On average, self-directed study accounted for 6.69 h/week for FM during the curriculum. SPs invested 1.66 h/week in studying with the podcast for FM. More than half of the respondents (52.2%; 24/46 SPs) used podcasts for $\leq$20% of FM study time, 15.2% (7/46 SPs) for up to 60%, and 4.3% (2/46 SPs) for $\geq$61%. Few SPs used podcasts as a primary LA.

Based on qualitative comments, the SP arguments in favour of learning with podcasts include **easy topic introduction** (33.3%, 23/69), **repetition** (31.8%, 22/69), **multitasking** (26.1%, 18/69), and **understanding complexity** better (8.7%, 6/69).

Most SPs (73.8%; 34/46 SPs) rated the podcast as relevant (47.8% slightly relevant, 21.7% very relevant, or 4.3% highly relevant) for exam preparation on a seven-step Likert scale. A Spearman correlation ($\rho = 0.269$, $p = 0.094$), corrected for total study time, suggests

a positive, though statistically non-significant, correlation between podcast study time and exam performance.

SPs ranked Amboss® as the most-used LA for exam preparation in comparison to all other LAs ($p < 0.001$). Podcasts were ranked among the least three important LAs (Table 1). Podcasts were significantly less used than Amboss, old exams, or lecture slides for exam preparation (see Table 2 for $p$ values). Additional details on learning behaviour are also shown in "Supplementary Materials".

**Table 1.** Ranking of learning activities' popularity for exam preparation (1 = most used; to 8 = least used).

| | Amboss® | Via Medici® | Lecture Slides | Script | Old Exams | Notes | Podcasts | Literature |
|---|---|---|---|---|---|---|---|---|
| N | 85 | 76 | 78 | 71 | 77 | 73 | 73 | 74 |
| Mean | 1.85 | 5.99 | 3.41 | 5.25 | 2.66 | 4.66 | 5.99 | 5.70 |
| Median | 1.00 | 7.00 | 3.00 | 5.00 | 2.00 | 5.00 | 6.00 | 6.00 |
| Standard Deviation | 1.61 | 2.61 | 1.42 | 1.43 | 1.67 | 1.48 | 1.74 | 1.73 |
| Minimum | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 |
| Maximum | 8 | 8 | 7 | 8 | 7 | 8 | 8 | 8 |

N = number of responses; Mean = average ranking; 1 = most frequently used, 8 = least frequently used.

**Table 2.** Pairwise significance comparisons of podcasts with all other exam preparation activities (Holm correction applied).

| Comparison | Original $p$-Value | Holm-Corrected $p$-Value | Significant After Holm Correction? |
|---|---|---|---|
| Amboss® vs. Podcasts | 0.001 | 0.023 | yes |
| Via Medici® vs. Podcasts | 0.750 | 1.000 | no |
| Lecture Slides vs. Podcasts | 0.001 | 0.012 | yes |
| Notes vs. Podcasts | 0.001 | 0.006 | yes |
| Practical Training Script vs. Podcasts | 0.006 | 0.102 | no |
| Old Exams vs. Podcasts | 0.001 | 0.006 | yes |
| Literature vs. Podcasts | 0.414 | 1.000 | no |

N = number of responses. Holm correction applied to control for multiple comparisons. $p < 0.05$ considered significant.

### *3.4. The Impact of Podcasts*

This section states SPs' subjective evaluations of the usefulness and perceived impact of podcasts as a LA, including their relevance for exams, comprehension of complex topics, and motivational aspects. Most SPs (63.0%; 29/46 SPs) reported improved understanding of complex content after listening to the podcast. Of those who agreed, 25% (4/16) valued the **overview** for "summarizing and organizing" content provided by podcasts (qualQ 1, SP 19). Fewer SPs (18.8%; 3/16) appreciated "clinical case [presentations] and [...] everyday problems" (**everyday case reports from clinical practice**) (qualQ 1, SP 6). In total, 18.8% (3/16) valued **repetition** for "deepening and anchoring knowledge" (qualQ 1, SP 46). Some (12.5%; 2/16) stated that the podcast helps them "categorize diseases within a larger system and [make] abstract [conditions more] tangible" (qualQ 1, SP 43) to attain a better **understanding of illnesses**. The same proportion of SPs (12.5%) valued it for "self-assessment" (qualQ 1, SP 45). Additional benefits mentioned included **richness in detail**, **perspective** and **learning style**.

Most of the SPs (76.1%; 35/46) found podcast elements relevant for envisaging their future practice. Almost a third (30.4%; 7/23) mentioned **tips and tricks** that SPs experienced

as professional mentoring. The SPs described "general advice [that focuses] on differential diagnoses" (qualQ 2, SP 78) as meaningful for their professional development. In total, 21.74% (5/23 SPs) appreciated **daily clinical insights** such as "examples from everyday life [of a Family Doctor]" (qualQ 2, SP 14). Examples of those topics were as follows: "**Red flags**" (qualQ 2, SP 19) were mentioned by 17.4% (4/23), while **interdisciplinarity** implying "collaboration" (qualQ 2, SP 11), **patient management**, and **medical knowledge** were each named by 8.7% (2/23) of respondents, respectively. One SP (4.4%; 1/23) mentioned **professional capability** development as a way podcasts are being used by SPs.

The podcast's influence on career motivation varied. Most of the SPs (60.9%; 28/46 SPs) reported no impact, 34.8% (16/46 SPs) felt an increased motivation and 4.3% (2/46 SPs) felt less motivation to work in FM after listening to the podcast. A total of 47.9% (22/46 SPs) partly or fully agreed to the adding of more podcasts into medical curricula, while 23.9% (11/46 SPs) felt neutral, 23.9% (11/46 SPs) partly disagreed, and 4.3% (2/46 SPs) fully disagreed.

Among 28 SPs, 35 reasons in favour of using podcasts and 14 reasons against their use were provided. Podcasts that can be consumed while **multitasking** were valued by 28.6% (10/35), stating that podcasts "can be listened to alongside other activities" (qualQ 3, SP 21). An equal percentage saw them as an **add-on option**, especially for "auditory learners" (qualQ 3, SP 10). Podcasts' **low-barrier to accessibility** was appreciated by 17.4% (6/35), and it was also appreciated that podcasts can be listened to "at any time, [e.g.,] while driving, to pass the time" (qualQ 3, SP 11). Podcasts were also recognized by 11.4% (4/35) "for content **summary** and repetition" (qualQ 3, SP 37). Podcasts were seen as **practice-focused** (5.7%, 2/35) and "giv[ing] a great insight into actual practice and not just theory" (qualQ 3, SP 40). Less frequently mentioned were **clinical reasoning**, **memory integration**, and listening **experience** (2.9% each; 1/35). Among arguments against podcasts, 28.6% (4/14) criticized the **low time–benefit ratio** and found podcasts to be less precise. One SP stated that "[podcasts are] too long" (qualQ 3, SP 80) or preferred more "case [presentations]" as part of the podcast (qualQ 3, SP 80). A total of 21.4% (3/14) emphasized different **individual learning preferences**; e.g., "as a visual learner, the podcasts are of no use [to me] because [. . .] the content [is] forgotten in a short time" (qualQ 3, SP 56). In total, 14.3% (2/14 SP) found them "**unstructured**" (qualQ 3, SP 33) and 7.1% (1/14) not suited for "**factual learning**" (qualQ 3, SP 28).

## 4. Discussion

Most SPs used the podcast and considered it a helpful, low-threshold, learning tool, particularly for contextual understanding and motivation in undergraduate FM. The main value can be seen in its accessibility, support for multitasking, and career orientation. Despite some criticism regarding length and structure, the students appreciated the podcast's contribution to making abstract concepts more tangible and connecting theory to practice. At the same time, it is not a LA for everyone. It may primarily serve as an additional LA in a curriculum. Despite the lack of a significant correlation between podcast use and exam performance, podcasts may support learning in other areas. This study shows that podcasts do not primarily serve as performance-oriented LAs, but rather promote motivation, understanding of complex content, and career orientation among students.

### *4.1. Podcast Use in a Learning Context*

About half of the students listened to the recommended podcast predominantly while multitasking during everyday activities. While existing research mainly focuses on factual knowledge transfer, this study examines the role of podcasts as a LA in FM from a student

point of view [1,7,11]. Many students found it helpful for understanding complex content and gaining practical insights.

When interpreting these findings, it is important to consider the German examination context. Written assessments in undergraduate medical education are almost exclusively multiple-choice exams. Students therefore use old exam questions primarily to as repetitive testing during exam preparation. Other learning objectives, such as insights into a clinical career path, affective communicative competencies, or management skills may not be the main focus of students preparing for multiple-choice exams (assessment-driven learning) [18]. Interestingly, some students reported using podcasts for exam preparation with a frequency comparable to books or scripts, although all three were ranked relatively low, suggesting that they are either perceived as outdated or serve purposes other than exam preparation.

This study's findings are in line with what was shown by previous studies concerning podcast structure and listening behaviour [2,8–10]. Most listeners engaged with podcasts selectively, often focusing on the main segment due to time constraints and personal learning preferences. For future podcast developers, episodes should be concise, structured, and supplemented with interactive and integrative materials to enhance engagement. Podcasts should supplement other traditional LAs; they are not perceived as a replacement for other LAs, but as an add-on.

### *4.2. Podcasts' Clinical Value and Effect on the Looming General Practitioner Shortage*

Beyond theoretical knowledge, students value the practical relevance and insights into real-life scenarios that podcasts may provide. Relating LAs to the workplace becomes more important in competency-based medical education. Other research suggests this may be a potential reason why some traditional LAs are increasingly questioned or replaced by modern LAs such as podcasts [1–7].

For 34,8% of SPs, the podcast influenced their motivation to consider a career in FM. The literature suggests that increased motivation could indirectly help address the current shortage of GPs [13]. This finding is in line with the core concept of Ryan and Deci's self-determination theory, where autonomy, combined with perceived self-competence and social relatedness, plays a major role in establishing intrinsic motivation. Podcasts can provide many of the elements mentioned by Ryan and Deci. Relatedness is gained by making complex topics more accessible and easier to understand, especially from the personal point of view of the podcast speakers. The listeners are reached during their private or personal life, allowing the speaker to be part of one's personal routine. It may also arise when students identify with a podcast guest, reflecting a role-modelling effect that influences perceptions of future career choices as well as students' sense of competence and autonomy [13–15].

This study provides first descriptive evidence on how podcasts can be integrated into an undergraduate curriculum and how students use this new LA. Podcasts are perceived not as replacements, but as complementary tools that support understanding, motivation, and possibly professional identity formation. These insights help to further shape the role of podcasts in competency-based undergraduate education. Future research may want to verify these findings in other settings or curricula. Future research may want to investigate whether podcasts can play a specific role in addressing the motivation of becoming a GP. Artificial intelligence may help create podcasts as LAs in the future, making them an even more feasible LA for curriculum development.

### *4.3. Strength and Limitations*

This study aims to provide an undergraduate medical student's perspective on a new LA that is increasingly used in medical education. The results of the study should be seen from a constructivist point of view, where different perspectives may create more and more perspectives—they may build upon one another. With 92 participants from one German university, generalizability may be limited. Regional or national differences in podcast access, teaching practices, or curricula may lead to varying results. Any LA must be seen and interpreted in its regional social and cultural setting. Self-selection bias is possible, as students with positive attitudes towards podcasts may be overrepresented. Although podcast use was recommended as exam preparation, its use was voluntary and not enforced. Since the data was collected before the exam, it could be influenced by social desirability (as participation was not tracked or observed by staff). Since the study was conducted for FM, it is not guaranteed that it can be applied to other medical specialties.

## 5. Conclusions

This study highlights the supplementary role of podcasts in undergraduate FM education. While they are not commonly used as a primary LA, students value them for their flexibility, accessibility, and practical orientation—especially when used during multitasking. Besides enhancing understanding of complex content, podcasts provide insights into everyday clinical practice, which may positively influence students' motivation to pursue a career in FM.

Their didactic value lies less in improving exam performance and more in supporting contextual learning and career orientation. To fully unlock their potential, podcasts should be strategically integrated into curricula. They should be short, structured, clinically relevant, and complemented by interactive and multimodal materials. Podcasts should not be used to replace other LAs. Further research is needed to explore their long-term effects and their possible contribution to addressing the shortage of general practitioners.

**Supplementary Materials:** The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/ime4040048/s1.

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**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of Saarland Chamber of Physicians (protocol code Bu 234/20; 22 March 2023).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy and ethical restrictions.

**Conflicts of Interest:** The authors declare no conflicts of interest.

## Abbreviations

The following abbreviations are used in this manuscript:

| | |
|---|---|
| GP | General practitioner |
| FM | Family medicine |
| LA | Learning activity |
| qualQ | Qualitative question |
| SP | Study participants |
| UdS | Saarland University |
| N | Number of responses per question |

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