SECTION: ARTICLES

Reverse mentoring: preparing a digital teaching course for teachers during the Covid-19 pandemic[1]

Eduardo de Aquino Médici[2], Lídia Duarte Costa[3],
Briana Henriques Machado Tarabai[4], Graziella Lage Oliveira[5]

ABSTRACT

The purpose of this paper is to report the experience of preparing the Teacher Training course in Digital Teaching. Due to the adherence to Emergency Remote Education, precipitated by the pandemic of Covid-19, students of the Study Group in Didactics Applied to Medicine Learning proposed to develop the course based on reverse mentoring. After evaluating the teaching demand, a self-instructional course was organized, organized in modules in the Google Classroom. 572 teachers enrolled in the course, who were allocated to classes, the first being composed of 138 teachers. Despite the high demand, the completion rate of the first class was low (3.6%). It is suggested that the short time between the study and the beginning of the didactic activities, the overload of the teacher and greater interest in the functioning of the platforms, despite aspects related to didactics, have reflected in this rate. Reverse mentoring proved to be useful for the acquisition of skills and competences.

Keywords: Reverse mentoring. Teaching in the context of Covid-19. Higher education institutions.

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[1] The authors were responsible for translating this article into English.

[2] Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, MG, Brasil.
ORCID ID: https://orcid.org/0000-0002-6187-7979. Email: edmedici@ufmg.br
[3] Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, MG, Brasil.
ORCID ID: https://orcid.org/0000-0002-3895-0592. Email: lidiaduarte@ufmg.br
[4] Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, MG, Brasil.
ORCID ID: https://orcid.org/0000-0002-8062-0650. Email: bhmt@ufmg.br
[5] Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, MG, Brasil.
ORCID ID: https://orcid.org/0000-0002-3387-3583. Email: graziellage@ufmg.br

Eduardo de Aquino Médici, Lídia Duarte Costa,
Briana Henriques Machado Tarabai, Graziella Lage Oliveira

Mentoría inversa: desarrollo de un curso de enseñanza digital para profesores durante la pandemia Covid-19

RESUMEN

El objetivo de este trabajo es dar a conocer la experiencia de preparación del curso de Formación del Profesorado en Educación Digital. Debido a la adherencia a la Educación Remota de Emergencia, precipitada por la pandemia de Covid-19, los estudiantes del Grupo de Estudio de Didáctica Aplicada al Aprendizaje de la Medicina propusieron elaborar el curso en base a la mentoría inversa. Luego de evaluar la demanda docente, se organizó un curso de autoinstrucción, organizado en módulos en el *Google Classroom*. 572 docentes inscritos en el curso, los cuales fueron asignados por clases, siendo el primero compuesto por 138 docentes. A pesar de la alta demanda, la tasa de finalización de la primera clase fue baja (3,6%). Se sugiere que el corto tiempo entre el estudio y el inicio de las actividades docentes, la sobrecarga del docente y el mayor interés por el funcionamiento de las plataformas, a pesar de aspectos relacionados con la didáctica, se han visto reflejados en esta tasa. La tutoría inversa demostró ser fructífera para la adquisición de habilidades y competencias**.**

Palabras clave: Mentoría inversa. Enseñar en el contexto de Covid-19. Instituciones de educación superior.

Mentoria reversa: elaboração de curso de ensino digital para professores durante a pandemia de Covid-19

RESUMO

O objetivo do presente trabalho é relatar a experiência de elaboração do curso de Capacitação Docente em Ensino Digital. Em função da adesão ao Ensino Remoto Emergencial, precipitado pela pandemia de Covid-19, discentes do Grupo de Estudo em Didática Aplicada ao Aprendizado de Medicina propuseram-se a elaborar o curso com base na mentoria reversa. Após avaliação da demanda docente, foi elaborado um curso autoinstrucional, organizado em módulos no *Google Classroom*. Inscreveram-se no curso 572 docentes, que foram alocados por turmas, sendo a primeira composta por 138 professores. Apesar da alta demanda, a taxa de finalização da primeira turma foi baixa (3,6%). Sugere-se que o curto espaço de tempo entre o estudo e o início das atividades didáticas, a sobrecarga do professor e o maior interesse no funcionamento das plataformas a despeito de aspectos relacionados à didática tenham refletido nesta taxa. A mentoria reversa mostrou-se profícua para aquisição de habilidades e competências.

Palavras-chave: Mentoria reversa. Ensino no contexto da Covid-19. Instituições de ensino superior.

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INTRODUCTION

In December 2019, a new disease caused by the etiologic agent SARS-COV-2 was reported in China and named coronavirus disease (Covid-19). In January 2020, Covid-19 received pandemic status by the World Health Organization (WHO), configuring itself as a public health emergency of international importance (PAHO, 2021). Undoubtedly, the Covid-19 pandemic brought a series of implications for the economy, for public policies, for health services, for the national and international markets and for education.

This last sector was particularly one of the most affected by the measures taken to contain the disease, such as the social isolation imposed by the pandemic. Among the various consequences of this control measure, particularly for education, we can mention the closing of schools with the migration from classroom teaching to an education mediated by Digital Information and Communication Technologies (TDIC), also called Emergency Remote Teaching (ERE).

In compliance with MEC Ordinance No. 343/2020 (BRASIL, 2020a) and Provisional Measure No. 934/2020 (BRASIL, 2020b), public and private higher education institutions adapted classroom classes for digital media while the Covid-19 pandemic persisted and vaccines were not available.

At the Federal University of Minas Gerais (UFMG), all face-to-face activities were suspended on March 18, 2020, pursuant to Ordinance No. 1819 of the Rectory of UFMG, and the ERE regime began on August 3, 2020.

The adoption of such an educational model was carried out in a short time (four and a half months) and gave teachers the challenge of adapting teaching plans, contents, methodologies, assessment strategies and forms of access to the bibliography in a short term (SALABERRY *et al.*, 2020). In addition, it was up to the teacher to think of strategies that would guarantee the continuity of quality education, considering the access of students with limited infrastructure to virtual materials. This new responsibility was received by professionals whose training focus, in general, is research, with little to no training in didactics on virtual teaching platforms. Consequently, the methodology adopted in this new format is hardly suitable for the individual and collective study of the student, so that tools are needed for the continuing education of teachers (ARAÚJO *et al.*, 2020; FERREIRA *et al.*, 2020).

This whole new scenario brought educators a lot of insecurity, overload and fear in the face of the new teaching practice that presented itself. These feelings, added to the frustration of technological barriers and the lack of student engagement, only highlighted the need for support during this transition, both emotionally and technically (SALLABERRY *et al.*, 2020).

Even for a generational stand point, some teachers had never been exposed to TDIC, which implies, among other things, the adoption of active teaching methodologies. In this sense, the change from the face-to-face format to the remote format led to the decentralization of the education process, which is no longer played by the teacher but becomes focused on the student (ARAÚJO *et al.*, 2020) and on the redefinition of the relationships between educators and students (FERREIRA *et al.*, 2020).

This change in the teaching-learning dynamic reinforced the importance of adopting asynchronous strategies through platforms with easy access to classes and documents, considering the differences in the students' routine and their possible limited internet connection, in addition to reinforcing their active role in learning. The asynchronous model, to succeed in providing support to students and teachers, depends on the formation of communities through forums, a tool through which the communication channel between the parties would always be accessible (SALLABERRY *et al.*, 2020; ARAÚJO *et al.*, 2020).

In view of the difficulties pointed out, the Study Group on Didactics Applied to Learning in Medicine (GEDAAM), through its previous experience in the subject of Study and Didactics, sought ways to understand the demands of teachers and provide, in an accessible way, materials that would help in this process transition from face-to-face to remote learning.

GEDAAM is a peer mentoring group for medical students whose head office is located at the Faculty of Medicine at UFMG. The group also has members in other Higher Education Institutions (IES), such as the Faculty of Health and Human Ecology (FASEH) and the Federal University of Vales do Jequitinhonha and Mucuri (UFVJM), as well as inspired the creation of a cell at the Faculty of Philosophy and Human Sciences at UFMG (FAFICH) – the Study Group on Didactics Applied to Learning Psychology (GEDAAP). In addition to mentoring, the group studies and produces materials in written and digital media related to health, in addition to carrying out training activities on Learning and Evidence-Based Teaching, aimed mainly at students. The group uses active teaching and learning tools to help students on their academic path. Formed in 2013 by student initiative, it has become over time a large project with affiliated groups in several medical schools in Minas Gerais. In 2019, given the need to formalize the work carried out and institutional support to support the expansion and maintenance of the GEDAAM, the first professor was incorporated into the coordination team. The measure had little impact on the autonomy of students, who continued as protagonists of the project.

Given the context of the need to adapt UFMG disciplines to remote education, the teaching coordinator's report on her and her professional colleagues' difficulties was crucial for the group to decide to put into practice the teaching and didactic knowledge discussed in their

meetings, in order to actively contribute to the process of teaching adaptation. Combining the expertise of GEDAAM with the need to adapt the disciplines to the ERE by the teachers, the members of the group proposed the realization of an extension course in Teacher Training in Digital Teaching, aimed at teachers from HEIs.

The concept of creating the course fits into the perspective of reverse mentoring, which occurs when the educational model loses its hierarchy, enabling a reciprocal and temporarily stable relationship between a less experienced mentor who provides specialized knowledge to a more experienced mentee (CLARKE *et al.*, 2019; CHAUDHURI; GHOSH, 2011; STÖGER; ZIEGLER; SCHIMKE, 2009). The purpose of this relationship is the development of both parties: the mentor provides knowledge, while the mentee encourages the development and reflection of the former. This format is usually applied in contexts of technological updates of veteran members by younger members who master these technologies, while those participate in their training and preparation (RAZA; ONYESOH, 2020; FOSTER, 2019).

In this sense, the creation of the course is a clear example of the application of reverse mentoring, in which a group of students with expertise in digital tools acts as a mentor to less experienced teachers in this aspect, but more experienced in relation to their own disciplines and context. academic. Therefore, the aim of this article is to describe the process of conception, creation and execution, as well as the preliminary results related to the elaboration of the digital teaching course for teachers.

EXPERIENCE REPORT

Due to the urgent need for teacher training to adapt the content of the on-site disciplines to the ERE, as well as for the handling of digital teaching resources, the first step in preparing the course was to understand the teachers' demand and their knowledge about the digital teaching tools.

Hence, a demand survey was carried out through the application of an online questionnaire, via Google Forms, to UFMG professors about topics and skills to teach online meetings. After three days of disclosure, 163 responses were received, reporting from the simplest technical difficulties to the need to edit videos. Data regarding teachers' knowledge of some of the various digital platforms are described in Figure 1.
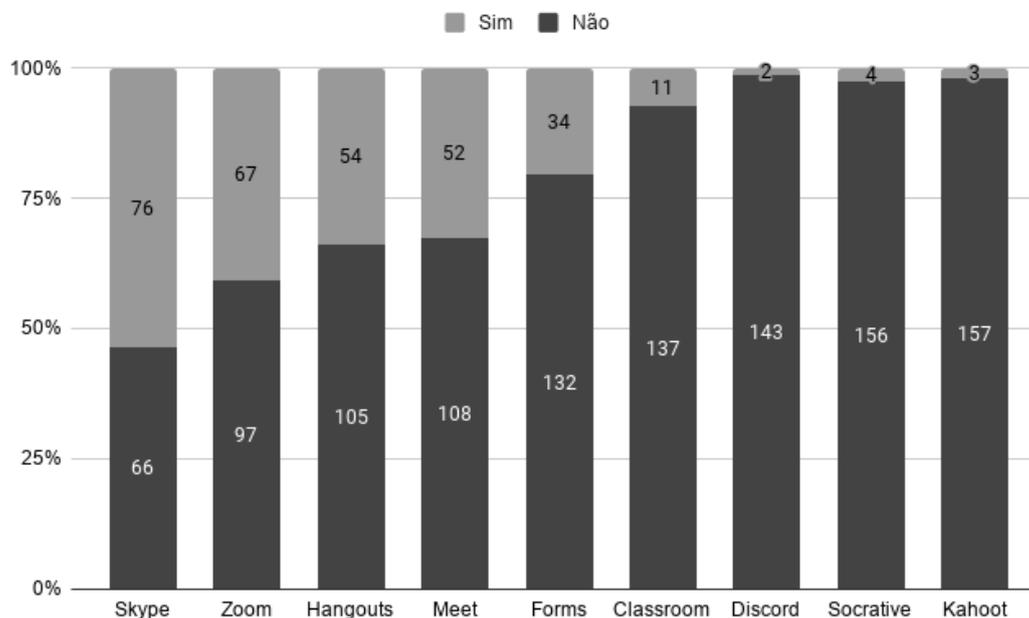
Figura 1 – Teachers' knowledge about digital platforms and resources (n=163)
Source: prepared by the authors.

The teachers' answers showed extensive difficulties and a plurality in the level of knowledge about the main existing digital platforms. The best known programs were videoconferencing such as Skype, Zoom, Hangouts and Meet. All other programs listed had a very low percentage of knowledge among teachers.

Considering the wide variation in these responses, the group chose to design a self-guided course and simultaneously make all the material produced available, so that the teacher could focus on the topic they considered most relevant, according to their expertise, and follow the pace that would be more suitable for completing the course.

As previously mentioned, the time for curatorship, elaboration, assembly, testing, availability and implementation of the course itself by the professors was very short. The production of all the material (composed of instructional videos, auxiliary texts and fixation exercises) was carried out in just two weeks by the GEDAAM team.

In order to make it possible to do all this in such a short period of time, the nine students responsible for preparing the course used the Kanban method to organize and manage the tasks. It is a production chain control tool developed by Toyota and normally applied in the production of software due to its dynamism in detecting errors and correcting them during development. According to this method, the agility to perform the task depends on the visualization of the production line, limitation of items under simultaneous construction,

control of the process under development, explicitation of goals and implementation of feedback loops (AL-BAIK; MILLER, 2014).

The Kanban method was chosen by the students because it is an agile methodology for the dynamic development of projects, facilitating decision-making, increasing team coordination, encouraging "brainstorms", increasing the profitability of proposals, developing skills between team members and product quality improvement (Al-BAIK; MILLER, 2014). All this is due to the visualization of a board, in which the flow of charges is organized and made available to the team. Trello (ATLASSIAN, 2021) was the tool used during the preparation of the course, it is an application that uses the Kanban method through columns where task cards are added. In these cards, deadlines, documents, goals and other information related to the task that the card symbolizes can be edited. Columns are spaces where the cards are arranged, symbolizing the period of development of each card's task. In our case, we created cards for each topic in the modules to monitor their development and intervene when there was a delay. On these cards, there was information related to those responsible for each task, completion deadline and development checkbox (text production, video recording and preparation of the assessment). The cards were distributed in the columns: "beginning", "under development" and "completed"; in this way, students were able to optimize the construction of the course, building cards with well-defined tasks and deadlines and identifying those that needed help to complete.

Having defined the form of organization of the team, the format of the course was designed considering the aspects listed by the professors as fundamental and urgent to learn. It was decided to divide the course into modules, initially privileging: 1) Digital platforms and access to electronic materials (it presented in general terms the main digital platforms and how to make available and access materials through it); 2) Setting up a class (it indicated the various steps for preparing a class in digital format, including choosing the material, mounting slides and using active methodologies); 3) Engagement (it listed and suggested ways to hold students' attention in this teaching format); 4) Gathering feedback and examining (it is aimed at building forms of assessment on the content taught).

Once the course themes were defined, the students were divided into trios, so that each student was in at least two modules simultaneously, but with different roles (reporter, reviewer or evaluator), according to the affinity and knowledge each had on the topic. The subgroups created the contents of each module separately, so that the four modules were done at the same time. As each module was completed, the groups also underwent an assessment by the coordinating professor of the GEDAAM.

After completing the material to be used in the course, the platform where it would be hosted on the web was defined. Google Classroom was chosen for the creation of classes in the teachers' course due to its layout that resembles that of a social network, in order to facilitate its use, in addition to being a free resource with a simple and intuitive design, which facilitates learning.

For a preliminary assessment of the content and function of the platform, a beta class was created with invited professors. This beta class had teachers who had answered the demand questionnaire and were selected according to the level of proximity that each one reported having with the digital teaching tools (little or none; reasonable; a lot). Each teacher was asked to give feedback about the platform, materials and perception about handling. The intention was to verify if the course and the platform were accessible to the previously observed plurality of teacher profiles. After a week of testing the betas, important adjustments were made to the course format, with the inclusion of two new modules: Introduction and Final Thoughts. The first class was created with 138 professors, out of a total of 572 enrolled from different HEIs, and of these, 38.5% from UFMG, teaching for Medicine courses (44.5%). The first class of the course started on June 1st, 2020 with a total workload of 8 hours, with a maximum time for access, completion and certification of 60 days. Due to the exceptional and urgent scenario, the UFMG professors were prioritized in this first class, since the return to the institution's activities was scheduled for August 3, 2020. In this way, the professors would have around 60 days to learn about digital platforms, adapt the subjects and all their classes and start remote learning. More information about the menu and activities proposed in each module of the course can be obtained directly from the UFMG Extension Information System website (SIEX, 2021).

All content related to the course and instructions for using the platform were made available for download in PDF format on Google Classroom; feedback or evaluation forms on links on the same platform; and the videos were posted on YouTube, also with access links directly through the platform. Thus, the course was based on the idea of being self-guided, with all materials being offered simultaneously and being available on easily accessible platforms for the entire period of the course. The purpose of the format adopted was to allow the teacher to optimize the teaching adaptation process, focusing on topics that were most in demand, without having to follow a predetermined order, according to the time available to carry out the course. Furthermore, as it is asynchronous, the mentors were able to organize themselves to support the professors, solving doubts and stimulating discussions among the course participants in the forum.

The content of each of the six final modules is described below. The "Introduction" was intended to welcome attendees as well as introduce the GEDAAM, course objectives, and

instructions on using Google Classroom. This presentation was made on video by the president of GEDAAM at the time and included the participation of students involved in the preparation of the course, in addition to the teaching coordinator.

The module called "Platform and access to materials" contained instructional videos about Google meet, Google Classroom and video resources. For each platform, a forum interaction activity was made available to perform a task and discuss difficulties teachers had. The document was made available with links to tutorials on the use of these platforms and other trivia related to functionalities. An attachment to the module was made with video tutorials for recording lessons in PowerPoint.

The module "Assembling a class" focused on planning and executing classes and was the most dense in terms of content when compared to the others. It was structured in such a way as to encompass: 1) guiding principles for classes in a virtual environment, highlighting the main differences from a didactic point of view between these and face-to-face classes; 2) presentation techniques, ranging from the dynamic structure of a presentation to the engagement of your audience; 3) slide design in PowerPoint; 4) editing the PowerPoint template using Slide Master tool; 5) theory of communication, encompassing all aspects worked throughout the module. All content was covered in video classes and written documents and attachments with examples of correction of PowerPoint templates were made available to teachers for download. This module had two moments of interaction of the contents learned in the forum and a theoretical evaluation in Google Forms.

The "Engagement" module was aimed at presenting the main engagement techniques and ways to measure it. He discussed techniques for engagement at the beginning of classes and how to deal with delays in virtual classes, as well as delving into the theory of class gamification, addressing the principles and presenting execution plans, and explained the importance of building rapport between students and teachers. Several of these themes were followed by interaction via a forum to discuss how teachers tried to engage their classes and how they dealt with class delays. This module included the presentation of the content in a written document and a theoretical assessment at its end, via Google Forms, so that teachers could also experience handling this type of assessment.

The module "Gathering Feedback and Examining" focused on different ways to assess student learning. The planning of an online assessment was discussed considering student's ability to access bibliographies or practice "cheating", presenting which elements should be assessed and what types of approach to examine the competences acquired by the students were discussed. Some individual and group assessment tools were presented, depending on teaching and engagement methodologies, and ways to reduce "cheating" during online

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assessments and feedback methodologies that could be employed to improve the approach to their disciplines. In addition to these aspects, possible platforms for formulating and applying evidence were exposed. The entire content of this module was made available through a written document and a video lesson on the use and editing of Google Forms for assessment contexts. As with the other modules, a theoretical evaluation via Google Forms was arranged at the end.

In the last module, called "Final Considerations", a forum was created for teachers to post feedback about the course and its content.

To make it possible to monitor the teachers during the course, the students were divided to clarify doubts and solve possible technical problems, closely tutoring the teachers' learning process and guiding them according to individual needs. As there were many people enrolled, the solution was to start with a smaller class (138 professors), who would have around 60 days to complete the course and obtain their certificate of completion; and progressively adding other classes, until all 572 professors were registered on the course platform. In all, 4 groups were formed in this first moment. Subsequently, all classes completed the course period and other classes were opened to serve teachers from other HEIs.

Feedback from the first class was collected on the Google Classroom forum, through some closed questions, with an overall positive evaluation. Regarding the relevance of the topics covered, 86.4% indicated it as "very relevant", 13.6% as "relevant" and 0% as "irrelevant". As for the organization of the course, 95.5% indicated it as "well organized", 4.5% as "average organization" and 0% as "lack of structure and organization". As for the methodology applied, 90.9% indicated it as "adequate", 9.1% as "regular" and 0% as "irregular". About the material used, 100% indicated "good or excellent" and no one indicated "fair" or "could improve or bad". In addition to the methodology, another positively highlighted aspect was the fact that showing the face in the recordings made them more humanized. Almost half of the professors (46.4%) reported having learned from the course and the desire to apply the content in their teaching practice.

Despite the positive feedback, a drop in enrollment was observed, with a 40% reduction in adherence between the first and second activity, aggravated in subsequent modules. At the end, 3.6% of those enrolled in the first class completely completed the proposed activities, and the modules that addressed the use of platforms for digital education and the way to set up a class were those with the highest rate of participation and engagement among those enrolled.

DEBATE

The experience report presented shows an example of the application of reverse mentoring. Problems commonly related to this type of mentoring were not observed in this specific case, for example, the issue of the perception of inversion in the levels of hierarchy between mentor and mentee (COLE; ZEHLER; ARTER, 2020; CLARKE *et al.*, 2019; LEEDAHL *et al.*, 2018; MURPHY, 2012; STÖGER; ZIEGLER; SCHIMKE, 2009; CHAUDHURI; GHOSH, 2011). On the contrary, the course received a lot of recognition among the participating professors and also by the institution, having been disseminated by other bodies within the university, such as the Innovation and Teaching Methodologies Board at UFMG.

Reverse mentoring was applied by medical students with the aim of instructing professors on technological resources for classes, in addition to illustrating didactic and assessment techniques in the digital context. The preparation of the course was only possible due to the process of training GEDAAM throughout its seven years of operation at UFMG, due to its experience in coordinating groups, preparing materials and handling digital media and tools.

It should be noted that there was a previous period of traditional peer mentoring for the development of skills in group didactics. The theoretical knowledge applied in the GEDAAM groups was developed through courses and theoretical framework of this theme, favoring the practice and experimentation of didactics before the formulation of the reported course. It is observed, therefore, how mentoring can be a positive practice in the context of higher education, providing students and teachers with the possibility of developing skills and communication skills, in addition to other important skills for the context of future professional practice.

The benefits of reverse mentoring are widely discussed in the literature and consider that the mentor develops greater satisfaction in their work, expands their network and gets feedback from a more experienced person, whereas mentee learns and expands their social capital (RAZA; ONYESOH, 2020; CLARKE *et al.*, 2019; MURPHY, 2012; CHAUDHURI; GHOSH, 2011; STÖGER; ZIEGLER; SCHIMKE, 2009).

The intensification of interaction through TDIC caused by the Covid-19 pandemic has become a challenge for a large number of teachers. The high demand for content, evidenced by the number of enrollments in the course offered by GEDAAM, is an indication of the urgency of teachers to seek or expand their knowledge about the tools and ways of adapting classroom classes to the ERE, which was also evidenced in other courses and HEI (ARAÚJO *et al.*, 2020; FERREIRA *et al.*, 2020).

Despite the great initial demand for the course, there was also a high dropout rate during this course. The active participation and the most expressive completion of the first class of the course took place in the modules in which the digital platforms and instructions for setting up classes were addressed. In the context of online courses, adherence is closely related to the usefulness of the topic for the student (BAIG *et al.*, 2013), reinforcing the hypothesis that the interest of the mentees in the evaluated course was greater for technological knowledge than for its foundation. didactic technician exposed in the subsequent modules.

This reduction in adherence is expected in the context of virtual education (HADI; GAGEN, 2016). An aggravating factor is the short period available for learning and mastery of tools for adapting classroom materials to the virtual environment (40 days in all) while teachers needed to deal with the insecurity of the global health context and with individual-level changes related to family and work remotely. Similar problems were observed by Sallaberry *et al.* (2020), in which the professors state that the change in the context of classes to the ERE resulted in great difficulty in separating the work routine from the personal routine, often resulting in work carried out 24 hours a day. day, seven days a week. It is to be expected, therefore, that the professors would privilege one or another module of the course to the detriment of those who considered themselves with greater expertise.

Adherence to the ERE brought a series of challenges to teachers, which include the previously mentioned adaptation and flexibility in relation to a new form of teaching and learning, as well as the use of technological tools, problems related to motivation and engagement of students in the virtual environment, the difficulties faced by students with regard to access to technology - which also impact the pedagogical relationship, which needed to be adapted outside the physical environment of the classrooms -, and the institutional demands and charges (GODOI *et al.*, 2020; SALABERRY *et al.*, 2020; FERREIRA *et al.*, 2020).

Even if adherence was lower than expected, the satisfaction of the mentees was high. The feedback given by the first participants was positive, highlighting the didactics applied in the materials. From the point of view of the students who set up the course and did the reverse mentoring, the gain was substantial: whether in terms of improving their knowledge, recognition among peers and professors or the acquisition of skills and competences, which are certainly important for their professional practice future.

FINAL CONSIDERATIONS

The research prior to the course showed the great demand of the professors for the subjects that would be covered in the project. After analyzing the initial results, the importance of

reverse mentoring offered by GEDAAM as an option to facilitate learning about digital tools and teaching tools by teachers became evident.

The importance of reverse mentoring in the context of higher education was also highlighted. In the report presented, the role of GEDAAM as a facilitator of the learning of digital and teaching tools by teachers was evident, acting as an active agent in the process of transformation of higher education, through mutually beneficial and enriching interactions between students and teachers.

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Eduardo de Aquino Médici
Acadêmico de Medicina pela UFMG (10º período). Atua ativamente em iniciativas de estudantes para a promoção de uma educação médica mais didática. Membro do Grupo de Estudos em Didática Aplicada ao Aprendizado em Medicina (GEDAAM) (2018–atual), no qual ocupa o cargo da presidência em 2020/2. Diretor de Ensino do Diretório Científico da UFMG (2020–atual).
edmedici@ufmg.br

Lídia Duarte Costa
Acadêmica de Medicina pela UFMG (9º período). Atualmente, é diretora-geral da Diretoria Científica do GEDAAM, grupo no qual atua desde 2017, e Corpo de Apoio da Diretoria de Ensino Médico da Sociedade dos Acadêmicos de Medicina de Minas Gerais (SAAMG).
lidiaduarte@ufmg.br

Briana Henriques Machado Tarabai
Acadêmica de Medicina pela UFMG (7º período). Participa do GEDAAM desde 2018, atuando em apresentações e organização em eventos e cursos ministrados pelo grupo, do qual é membro da Diretoria de Marketing. Membro da Liga de Cirurgia Pediátrica (LACIPED) e participa da organização do I Medical Students' Congress.
bhmt@ufmg.br

Graziella Lage Oliveira
Mestre e doutora em Saúde Pública pela UFMG e pós-doutora em Saúde Coletiva pelo Centro de Pesquisa René Rachou - Fiocruz/MG. Atualmente, é professora adjunta do Departamento de Medicina Preventiva e Social da Faculdade de Medicina da UFMG. Ocupa o cargo de Coordenadora Docente do GEDAAM desde 2019.
graziellage@ufmg.br