Didactic Material Production Management

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The preparation of didactic materials involves management and pedagogical practices that directly infer the quality of a course, as it is considered that the didactic material is the leitmotif of the teaching-learning process. The objective of this study is to map the production management practices and didactic content management for distance education (DE). The methodological procedure used for the gathering of practices adopted in the preparation of didactic materials followed the basic principles of exploratory research. Data collection technique was made through semi-structured interviews, seeking to identify best practices from benchmarking in institutions of Southern Brazil. For the analysis of collected data, we did qualitative descriptive analysis. The results showed that the majority of the surveyed institutions do not follow a management model for the production of didactic materials. It is expected that the mapping of good practices presented in this research can contribute to the debate on management in the process of production of didactic materials in DE from the perspective of a model of instructional design in which originates and intersects the production of didactic materials for the modality.

Keywords: distance education, didactic material, instructional design

Introduction

In the context of distance education (DE), the production of didactic materials is the determining factor of success in a course, because it assumes the role of guide in the teaching-learning process. The development of didactic materials involves the management of different actors, processes, and technologies, so that a course can be offered with quality and suite to the needs of the expected audience. As for the importance of improvement of production processes of didactic materials on DE, management practices can be considered a strategic point in the maintenance and continuity of the system.

Benchmarking, a management strategy created at the end of the 1970s in order to identify best practices within an organization, is an action that can be performed on educational projects to identify best practices and propose solutions based on new knowledge.

Batista (2012) and Balm (1995) indicated benchmarking as an internal and/or external practice to the institution in search of better references for comparison of processes, products, and services of the same or similar branch. For North and Rivas (2008), benchmarking basically let you compare the structuring processes and identify best practices in a company. For the Asian Productivity Organization (APO), benchmarking is a

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process with the goal to find, adapt, and implement new practices based on existing models (APO, 2005). According to the APO, benchmarking begins with the identification of what you want to improve followed by learning about how to improve, through partnership and knowledge sharing of institutions that stand out in the area in question. Benchmarking plans to implement change, monitoring the performance and the identification of new opportunities for improvement (APO, 2005).

Method

To identify best practices in the production of didactic materials in DE using the benchmarking tool, this study adopted some steps of exploratory research, such as visits and semi-structured interviews. Instructional design became the object of study, because it is understood that it guides the management of development of didactic materials in DE.

After collecting information, the instructional design practices identified were organized, creating a dialogical problematizing array based on preset conceptual categories. To analyze the information collected, analysis of the Collective Subject Discourse (CSD) of Lefevre and Lefevre (2012) was used as reference. This procedure meets in a speech-synthesis the key expressions and the central idea.

Key expressions are pieces of excerpts or segments, continuous or discontinuous of speech, which must be selected by the researcher and that reveal the essence of the content of the statement or speech (Lefevre & Lefevre, 2012, p. 73).

The central idea is a name or linguistic expression that reveals and describes the most synthetic and accurately as possible the meaning or the meaning of the key expressions. The central idea is what the interviewee meant (or what, about what) and the key expression as it was said (Lefevre & Lefevre, 2012, pp. 76-77).

Initially, it was mapped, for the research, companies in the State of Santa Catarina that offer educational solutions, according to the Secretaria de Estado do Desenvolvimento Econômico Sustentável/Secretary of State for Sustainable Economic Development (SDS), published in 2013. It is understood as educational solutions, according to an interview with a representative of the SDS, innovation to facilitate the process of teaching and learning, which involves companies and projects that develop products related to information and communications technology (ICT). To refine the search, we selected the middle region of the greater Florianópolis/Santa Catarina, resulting in 67 institutions offering educational solutions. Of these, 20 companies are described in the report as having something to do with DE service and only 17 of them have a steady stream of demand for DE; the other three serve projects by specific demands sporadically. Of the 17 institutions mapped, after previous contact (email and telephone), only six were selected for interviews, because they work with the production of didactic materials, a specific focus of this study. The result was a sample, based on SDS (2013), of six institutions: four private companies providing service, a federal public educational institution, and a community education foundation.

To diversify the sample, we used the *Census EaD. BR 2013* (Associação Brasileira de EaD/Brazilian Association of Distance Education [ABED], 2014), from which have been mapped intentionally institutions of Santa Catarina. Through contact held previously, considering the central objective of research (production of didactic materials), we sought to complete the initial sample in order to cover four segments for this research: (a) private institution (educational or service provider to DE); (b) public educational institution; (c) community education foundation; and (d) autarky. As a result, we had the participation of other three institutions: (a) a community foundation; (b) a public institution; and (c) an autarky. In addition to the nine institutions, we

sought two more of private character to draw up different sample materials previously defined. One of the selected institutions focused on the production of materials for the training of clients who purchase their service (software). The other institution is part of an educational group considered leader in the sector of DE in Brazil.

Thus, the effective sample of this research consists of 11 organizations of different areas: six private institutions (five service providers and an educational institution), two public education institutions (federal and state), two community educational foundations, and an autarky.

Results and Discussion

The questions that guided the interviews for data collection were prepared in semi-structured mode and conducted openly in order to meet the peculiarities about the production process of didactic material. The interview included 21 questions organized into four areas: (a) identification (interviewed and institution); (b) demand and didactic model; (c) a multidisciplinary team; and (d) production process.

The answers were analysed based on key expressions and arranged in a problem matrix, using a data spreadsheet software, based on four axes defined, each with subsections determined by researchers in order to meet the objective of the research. After this segmentation, key expressions were identified and central ideas were defined by spheres. Table 1 presents the description of the sample of private institutions (education and DE services providers).

Table 1

Central Ideas of Private Institutions (Education and DE Services Providers)

Area	Subsection	Central idea
Identification	Time of existence	Between 8 and 45 years of presence on the market, with a concentration between 8 and 20 years
	Time working with DE	Between 4 and 19 years, generally (in four of the six institutions surveyed) commencing after the implementation of the company
Demand and didactic model	Demand	Focused on the production of materials for another private institution (academic and corporate material). Two companies use their own material. The demand is established through partnerships, commercial sector contacts, and direct customer demand. Half of the companies interviewed still participate in bidding. The production of didactic materials, in large part, is originally from the menu of disciplines organized in Political Course Project (PCP) planned by the institution; undergraduate, graduate, extension, and technical course; and short-term training. In some situations, the material is drawn from meetings for the routing of the briefing, which initiates the instructional design of the course.
	Didactic model	Based, according to all the respondents, in digital material and in Virtual Teaching-Learning Environment (VTLE). Five of the six companies interviewed also work with video classes. The printed material is produced and distributed on a smaller scale, due to costs. Games (listed as interactive activities) and material for tablet have been tentatively developed (around 50% of the respondents adopt such features). It is also mentioned the use of HTML5 language for responsive material.
	Professionals	A team is composed of a content teacher; an instructional designer (ID); a proofreader; a graphic designer (GD), or a Web designer or multimedia designer; and an environment programmer. The coordination is organized by project in four of the companies interviewed, organized by project and by area in one of the companies and organized by people in one of the companies. In addition to these professionals, some institutions have a staff video writer, monitor, tutor, educational analyst, information analyst, plagiarism analyst, developer of learning objects, and illustrator.
		Content teacher: Writes or organizes information for content-base. In some institutions surveyed, this professional also elaborates the learning activities and evaluation, in addition to the video classes.

(Table 1 to be continued)

Multidisciplinary team	Responsibilities of each function	<p>ID: Operates in different scenarios, such as production, organisation, and adaptation of content for educational purposes; travel planning; and management from concept to final validation, as well as the monitoring of content, didactic language adaptation for DE, instructional design validation, and production of content with the client. An ID can also work with the production and organization of screens to the Web.</p> <p>Proofreader: Responsible for spell check and textual and material regulations.</p> <p>GD: Responsible for the visual identity of the project in different media.</p> <p>Programmer: Prepares the VTLE, organizes the course, prepares the space for exchange of material management, and trains for tool use.</p> <p>Project coordination: Accompanies one or more projects from conception to completion, applying knowledge and technique for its implementation, as well as team's leadership and communication with senior management.</p> <p>Coordination by project and by area: Accompanies the activities related to the area under his/her responsibility.</p> <p>Coordination by people: Accompanies the work to be performed by a team organized in different areas.</p> <p>Plagiarism analyst: Responsible for ensuring material's authenticity and avoiding copyright infringement.</p> <p>Illustrator: Responsible for illustration or animation.</p>
	Technologies used by each function	<p>Content teacher: Text editor, according to all the respondents. Some companies also use a presentation editor.</p> <p>ID and proofreader: Text editor in all companies, and presentation and PDF files editor in some cases, in addition to authoring tool for specific activities.</p> <p>GD: Adobe package for all respondents, as well as authoring tool in some cases. An institution uses its own technology—"Inside Framework."</p> <p>Programmer: Most of respondents work with the Modular Object-Oriented Dynamic Learning Environment (Moodle) software. Some companies work with the client platform and one institution has its own platform for hosting the course.</p> <p>Coordination: Three of the six institutions interviewed have their own software. The other companies use spreadsheet, some shared in drive. Two respondents, in addition to their own software, also adopt a supporting software, such as Microsoft Project, virtual Kanban, and practice of Project Management Body of Knowledge (PMBOK). Shanel, Trello, and Redmine were also mentioned as management tools.</p>
Production process	Processes mapping	Four of the six companies surveyed have the material production process mapped and visible to all. However, during the interviews, only one mapping was visible. Two respondents indicated not having clear the mapping process, because the process is not explicit, or because it is not aligned to the business unit. Three of the surveyed companies review the process at the end of the project (for example, meeting of lesson learned), two do the review throughout the process, and one does not review, follow the flow of software.
	Flow	Three institutions consider that the production process begins with contact between client and project manager for planning and opening of the project. The remaining surveyed companies have the beginning of the project from the elaboration of content (which can go for adjust by the ID or for approval by the professor, or for proofreading). Some companies validate the contents at the first step; others at the end of the validation process. The vast majority of the respondents do only one proofreading to reduce production time. After that, the material is diagrammed and validated by the ID, to later be adjusted by GD and then posted in the VTLE.
	Deadline	All companies interviewed set the deadline of the project according to the customer's need; the development team needs to make it work. Four respondents indicated that the deadline is met, and two companies said that generally (around 50% of projects) do not meet the agreed time limit, although they are aware of the need.
	Challenge	For four of the six companies interviewed, the question people is the challenge—To maintain, manage, and select qualified persons with competence in the area. People are considered differential in the process, contributing to the continued improvement of the production. The development process itself is mentioned as a challenge, which requires flexibility and quality assurance. Another challenge is the lack of reference in the market itself about how to do DE, what it is wanted, and how it is wanted.

Note. Source: Authors.

Table 2 provides a description of the sample of public education institutions.

Table 2

Central Ideas of Public Educational Institutions

Area	Subsection	Central idea
Identification	Time of existence	Average of 50 years
	Time working with DE	Between 7 and 9 years
Demand and didactic model	Demand	Production for own use, focusing on graduation, eventually postgraduate (specialization) and extension. The material is elaborated from the educational project.
	Didactic model	Printed and digital materials, as well as VTLE. One of the companies interviewed prepares Web lessons and learning objects to promote interaction. Another company with the same concern works with thematic DVD.
Multidisciplinary team	Professionals	The content teacher works on demand. The ID and proofreader are scholars of the Universidade Aberta do Brasil (UAB) and outsourced. As for the GD and the illustrator, one researched institution has an information technology (IT) system, which these professionals are part of; in another institution, they integrate, along with the programmer, the core of Graphic Design of Hypermedia (GDH) and are responsible for the visual design, the illustration, and the treatment of VTLE. Coordination is by project. One of the interviewed institutions also has external referee and editorial committee, activities with content analysis function.
	Responsibilities of each function	Content teacher: Responsible for preparing the content and generally monitoring of discipline. ID: Responsible for contact with the teacher, the project presentation and DE learning methodology, language adaptation, for diversifying ways of representing knowledge, the proposal of activities, and for planning of educational discipline and pedagogical sketchbook. Proofreader: Responsible for reviewing spelling and regulatory review. GD: Responsible for developing graphics, Web classes, and other elements that have didactic contribution. One institution has a GDH core that diagrams printed, digital material, and virtual environment designer customizes the VTLE. One company has a video writer and an illustrator. Coordination is by project. One of the respondents also has the coordination of production, responsible for the production, regardless of the project.
	Technologies used by each function	Teacher, ID, and proofreader: Text editor. An institution interviewed has an <i>ad hoc</i> proofreader, which works with PDF file. Editorial committee and screenwriter: Text editor. GD and illustrator: Adobe. Programmer: Moodle. Coordination: Spreadsheet.
Production process	Mapping processes	In both surveyed institutions, the mapping exists and is visible to all, online and printed; a respondent presents the flow on a banner. One institution reviews the mapping over every production process; the other does not.
	Flow	The teacher prepares the content. In one of the institutions, the content is still evaluated by the editorial committee or referee. Then, ID is made, and then goes through the approval of the teacher. Later happens the content review followed by diagramming. Then, it is approved by the teacher and the ID. The GD makes necessary adjustments and the material is forwarded to the printer and to VTLE.
	Deadline	The period considered is of the graphics. On the team, the deadline is flexible, i.e., it is hardly fulfilled—A characteristic of intensive processes in intellectual production.
	Challenge	The challenge is the management of people, especially sharing of work. Another challenging factor is the lack of institutionalization of DE.

Note. Source: Authors.

Table 3 shows the sample of community education foundations.

Table 3

Central Ideas of Educational Foundations

Area	Subsection	Central idea
Identification	Time of existence	Consolidated institutions, with an average of 50 years
	Time working with DE	Between 6 and 11 years
Demand and didactic model	Demand	Production for own use, focusing on undergraduate and postgraduate. One foundation interviewed also has demand for extension courses and sequential programs. Work based on PPC.
	Didactic model	Both surveyed institutions work with digital material and VTLE. One still adopts printed materials and for tablet, interactive objects, and Web class, seeking to meet the training through an array of competence. Another foundation adopts video classes, in addition to digital material and VTLE.
Multidisciplinary team	Professionals	The content teacher is hired by project demand. One foundation has reduced team: The ID does the textual review as well as coordinating the production and the GD runs the VTLE and does illustrations. One institution interviewed has a video writer. Another has a diverse team, with ID, proofreader, GD, illustrator, programmer, and coordinator of the production process. There are also academic assistant, multimedia team, and learning evaluation team.
	Responsibilities of each function	Content teacher: Elaborates the content of discipline and learning activities. ID: Acts in pedagogical management of content and in planning the course as a whole. Proofreader: Does the spell check and textual and regulatory review. GD and illustrator: Diagram the material in printed and digital format, in addition to working the visual identity of the project. Programmer: Programmes the VTLE. In both surveyed foundations, coordination acts in the production, including the management of processes and people involved in the production of the material. One of the institutions has an academic assistant to review the VTLE material, so there is no need for the interference of the ID; Multimedia team to work the learning object in Flash; and learning evaluation team for organizing the bank of questions.
	Technologies used by each function	Content teacher, ID, and proofreader: Text editor. In one of the interviewed institutions, in addition to the text editor, authoring tool is also used in some situations. GD and illustrator: Adobe and authoring tool. VTLE programmer: Moodle. Coordination: Text editor and spreadsheet editor.
Production process	Mapping processes	In one of the foundations, the mapping is done digitally, in a repository, and meetings are held to review it throughout the development of the project, if necessary. The other institution has no mapping, because it considers that it is implicit in people's minds, there is no need for review.
	Flow	The process begins with ID and the coordination, with the project planning. After the teacher delivers the content, the instructional design of the material is made, which is then reviewed. The ID validates the material and passes to the GD to diagram; Subsequently, the ID and content teacher validate. The project is transferred to the GD for adjustments, generating the final file to the printer, in one of the institutions, and for the VTLE, in another.
	Deadline	Begins to count from the start date of the course and is not always fulfilled. One of the institutions is able to meet the deadline, because it posts on VTLE each unit of material, thus, not having printed material.
	Challenge	The challenge is diverse: Relating to people, the lack of pedagogical assistance for DE, and the complexity of control of material production.

Note. Source: Authors.

Table 4 presents a sample of an autarky in the field of teaching continuing education and youth and adult education (YAE).

Table 4

Central Ideas of Autarky

Area	Subsection	Central idea
Identification	Time of existence	Sixty-three years in the market
	Time working with DE	About 15 years
Demand and didactic model	Demand	Production for public and private institutions—Industry, with demand for continuing education and YAE. The client is the one looking for the autarky. The design of the course starts from the demand.
	Didactic model	Printed and digital material, video classes, VTLE, and games based on a competence array.
Multidisciplinary team	Professionals	Content teacher, ID, proofreader, GD, illustrator, IT staff, and coordinator by area.
	Responsibilities of each function	Content teacher: Organizes the content and training of those who will teach the course. ID: Organizes the content, taking care of the proper language for DE and the amount of page/hour, plus identify if the competencies proposed in the course will be accomplished. Proofreader: Performs textual and regulatory review. Illustrator: Develops the illustrations of the material. GD: Does the layout of the material. IT team: Responsible for the VTLE. Coordinator: Monitors the production process by project.
	Technologies used by each function	Content teacher, ID, and proofreader: Text editor. GD and illustrator: Adobe. IT team: Moodle. Production coordinator: Spreadsheet editor.
Production process	Mapping processes	Available on the intranet. Revised along the way and adjusted when necessary.
	Flow	Starts with the industry's demand, which counts with coordination and ID to do the planning. Then begins the preparation of the menu by the teacher. With the menu approved, the organization of the content is made. This is adjusted by the ID and then for proofreading, producing the material for diagramming. After being diagrammed, the material goes back for the teacher's analysis and the ID's second textual revision. The adjustments are made by the GD. The file is included in the VTLE and forwarded to the printer.
	Deadline	It is usually served. This is attributed to the time spent on planning, which allows to gain in production.
	Challenge	Selection of trained personnel for DE flow.

Note. Source: Authors.

One can see that the process of production of teaching materials for DE, although relevant in the educational context, is not treated as a priority in Brazil in projects without practice and recognized process. Each institution presents its model and manages according to the needs of their clients. The results show the absence of a management model to plan, organize, coordinate, monitor, and control the process of production of teaching materials in DE projects. Such a process has unique features, different with each new project.

Final Considerations

This analysis took a sampling of Brazilian institutions of different spheres to have a comprehensive overview about the process of producing teaching materials for DE. In this research, one can see the need for more effective organization of production of didactic materials from the perspective of a model of instructional design, process in which originates and intersects the production of didactic materials for the modality.

This study predates a more detailed research, from the first author, which aims to elaborate a management model for the essential processes of the production of didactic materials for DE.

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