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The Lesson Activities Map: A Domain-Specific Lesson Transcription Methodology

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Abstract: In educational research, audio-video recordings allow observing a lesson repeatedly. The collected data needs to be transcribed for analysis. Although methodologies for transcribing video-recorded lessons are established, there is lack of transcription methodologies for certain types of lessons, such as in arts education or the teaching to create new products. In our research project, we examine the teaching–learning of songs in class. Because of the absence of suitable transcription methodologies, we developed a new systematic approach. This paper presents the Lesson Activities Map (LAMap), which consists of symbols and icons representing graphically the constitutive elements of a domain-specific lesson. As a result, the LAMap provides a visualisation of the lesson content – in this context the song – and of how a teacher works on parts and the whole. The graphic representation supports the lesson analysis from different perspectives. The LAMap methodology and applications are valuable for transcribing other subject-specific lessons.

Keywords: *Lesson Activities Map, transcription, lesson visualisation, song teaching, arts education.*

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Introduction

In education research, lesson observation can be the starting point for studying the teaching–learning process. Audio-visual data collected through recordings and field observation usually needs to be transcribed prior to analysis. It is heterogeneous information, and the transformation to a written form can be a complex process. While some transcription methods, such as interview transcription, have been established, no specific methodology has been consistently used for the transformation of other types of audio-visual data. Specifically, lesson transcription is based on general principles, such as the reconstruction of the time–space dimension and the simultaneous or turn-taking teacher–learner interactions that can be determined by the distinctive features of the subject matter (Bucholtz, 2007; Duranti, 2006; Grundy et al., 2003; Hammersley, 2010; Jaffe, 2007; Lapadat, 2000; Skukauskaite, 2012; Witcher, 2010). This leads to the following question: How can domain-specific principles of lesson transcription be established?

In this article, we describe the Lesson Activities Map (LAMap), a graphic representation of lessons in a specific domain. The LAMap allows us to visualise the lesson content, which is the basis for teachers' interaction to organise activities to support learning. The LAMap was developed in the Song Leading research project, which focuses on the formal teaching of songs in the classroom to introduce children to the cultural practice of group singing. As a result, LAMap is based on a system of symbols and icons that represents the musico-linguistic structure of a song. The LAMap, which condenses the elements of the hierarchical lesson structure, is the graphic result of a transcription methodology developed to process audio-visual data as a whole. It supports the analysis of lessons at various levels of description and abstraction informed by epistemological choices and the specific aims of our study.

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This paper is organised as follows: First, the justification for creating graphic representations of lessons is discussed, and the general and discipline-specific principles underpinning the transcriptions are outlined. Second, the paper presents the Song Leading research project and the epistemological choices behind the development of the LAMap for visualising the analysis of song leading lessons. Third, the LAMap is described, and examples of its application are provided. Last, the preliminary graphic inputs and technical challenges encountered during the design of the LAMap are summarised and ideas for future work are proposed. The transcription methodology and the applications presented in this article could be of interest in future studies on song leading and teaching-learning processes in other domains.

Audio-Visual Transcription: Justification and Approaches

The processing of audio-visual data collected from recordings or field observation is generally termed “transcription,” the transformation from a manifestation to a written system (e.g., Brandenburg & Davidson, 2011; Davidson, 2009; Duranti, 2006). The transcription methods for discourse analysis (e.g., anthropology, linguistics, and biographical or guided interviews in psychology and sociology) were the first to be established. Over time, these methodologies were adopted for a wider variety of data, such as for the analysis of field notes, the interpretation of images and the analysis of videos. Transcriptions are also commonly used in education research and often involve the transformation of the data from observations or video recordings of lessons to a written form.

Researchers have agreed on the benefits of using audio-visual material to complement field observation. Indeed, audio-visual recordings facilitate the storage of and repeated access to data (Dinkelaker & Herrle, 2009; Pauli & Reusser, 2010). Video-based research is characterised by the potential for flexible data collection (Harris, 2016). However, there are conflicting definitions of videography as a method on its own. The present study supports the view that a video recording is information that is captured in a specific time-space context. A video is heterogeneous information for which the elaboration requires the application or development of specific methodologies (Harris, 2016). In this section we discuss the characteristics of audio-visual transcription and the general and domain-specific principles that guide the lesson transcriptions.

Features of Audio-Visual Transcription

A transcription is the written record of the manifestation of a phenomenon. It is implemented through the transformation of verbal and/or non-verbal information. In the transcription of verbal information, such as interviews, words are converted to text. This does not present particular difficulties because in a linguistic system, the oral expression of a word is associated with a unique written sign. In contrast, a conventionalised system is rarely available as a reference for the transcription of non-verbal information. Consequently, there are several definitions of the term “transcription.” Some approaches to audio-visual data analysis have considered the term misleading (Deppermann, 2014). In other cases, the term has been used to refer to several content transformation approaches. The differentiated forms are determined by the need to resolve theoretical and practical issues (Dinkelaker & Herrle, 2009; Knoblauch, 2012).

In research based on field observations and/or audio-visual recordings, the variety of non-verbal content contributes to the complexity of the transcription process. A video recording contains heterogeneous information from which the meaning cannot be deduced from the transcription of the linguistic components or the analysis of individual frames alone. For example, music and sound are acoustic information concomitant with verbal expression, while a frame is the contracted dynamism of actions, facial expressions, gestures and movements. Video information is also characterised by unique time-space conditions, such as the position of the participants and the perspective chosen for the recording. The transformation of an event into a written form provides visual support for the analysis of simultaneously occurring elements. However, a transcription should not be considered an outcome but, rather, a constructive instrument that represents the beginning and expression of research (Mey & Mruck, 2014).

A video is the matrix for the transcription process, which consists of reflection, selection (i.e., perception, intuition, identification and interpretation) and technical realisation (Bucholtz, 2000, 2007; Duranti, 2006; Grundy et al., 2003; Hammersley, 2010; Jaffe, 2007; Lapadat, 2000; Lapadat & Lindsay, 1998; Luhmann, 1992; Poland, 1995; Poland & Pederson, 1998; Skukauskaite, 2012; Witcher, 2010). The reflective phase of the transcription process begins when researchers ask themselves the question ‘What do we transcribe?’. The answers to this question lead to the selection phase where intuition is the starting point for the identification and interpretation of audio-visual information. The selection phase, which is guided by the researchers’ understanding of reality, is orientated towards the theoretical principles of the discipline and the goals and epistemological choices of the study (Dinkelacker & Herrle, 2009; Green et al., 1997; Joost, 2008; Knoblauch, 2012; Moritz, 2011, 2018; Ochs, 1979).

While audio-visual information requires conceptual elaboration, the realisation of a transcription also implies the technical elaboration of the components. This information must be annotated and converted to written form for analysis and dissemination. This technical operation can be performed manually or with the assistance of semi-automated transcription software. In both cases, the realisation of the written form of the selected audio-visual

components involves researchers in a new reflection process to answer the following question: “How do we transcribe it?”.

All of the information in a video could be translated through a direct relationship to a linguistic system. However, while verbal expression can be transcribed as text at an almost 1:1 ratio, many other components need to be reconstructed through concepts that define the relevant aspects of phenomena. For example, a facial expression or movement should be converted into a written description. Text transcription methods are inadequate because they capture only a small aspect of the information contained in a video (Moritz, 2011). This illustrates the necessity for new transcription methodologies that support the practical transformation of other components.

Some methodologies involve the use of codes and categories. However, other approaches are based on systems that are independent of verbal language and realised through the development of an appropriate semiotic system (Moritz, 2011). In these instances, the transcription of the audio-visual components conforms to a symbol and icon system. Such a system implies the definition of a metalinguistic lexicon, language and syntax, which needs to be informed by the discipline and the research goals. The search for the answers to the questions of “what should be transcribed” and “how it should be transcribed” is a dialectical process that could lead to the adoption of an established transcription methodology or the development of a new one. While the transcription from speech to text is a reproduction that could replace the original material (Moritz, 2018), the transcription of other audio-visual components is a reconstruction of the phenomenon mediated by researchers. The researcher’s development of an *ad hoc* sign system to interpret an observed phenomenon facilitates future analysis.

Lesson Transcriptions: General and Domain-Specific Principles

In education research, the teaching–learning process can be studied through field observation and/or audio-visual recordings. Both approaches can require audio-visual transcription. Lesson transcription is guided by general principles that transcend disciplinary boundaries. Lessons are formal events since they are generally organised according to factors which are bound by the school policies. Through the completion of assigned tasks, teachers coordinate disciplinary and interdisciplinary activities and organise each lesson to support different ways of learning.

A lesson is therefore an event with a hierarchical time–space structure that is usually based on goals and planned content. Transcription provides an overview of the observed lesson. The graphic reconstruction of the time–space dimension of a lesson follows the general principles of translation. Indeed, the sequentiality of the actions highlights the narrative nature of the phenomenon as expressed by the changes in the participants’ interactions. Consequently, another general principle of lesson transcription is the tracking of both teacher and learner actions. A lesson involves the teacher and the learner in a process of simultaneous or alternating actions and reactions. Some are planned and predictable, and others might be spontaneous or unexpected.

However, teachers plan activities to achieve lesson goals; thus, some classroom interactions can be subject-specific. The time–space dimension is therefore influenced by the structure underpinning the lesson content. In addition to conforming to translation principles, lesson transcription should be orientated to the reconstruction of these intentional structures to elucidate the distinctive features of the discipline. Through the dialectical process, researchers improve their skills for selecting the activities and actions that establish the guidelines for the graphic reconstruction of the phenomenon.

Semiotic systems facilitate the documentation of the reflection and selection processes that precede the realisation of the transcription. Such systems should emphasise the study goals and domain-specific audio-visual components. From these transcription principles, we have developed the LAMap as a graphic reconstruction of lessons in the classroom from the Song Leading research project. In this context, we designed and tested the transcription methodology and diversified applications of LAMap that could be valuable to the documentation of the teaching–learning process in other disciplines.

The Development of a Methodology to Transcribe Song Leading Lessons

In primary education, singing is often an aspect of children’s daily lives. It can also be a lesson, a planned classroom situation in which children are formally introduced to the cultural practice of group singing. Through singing songs in family environments and educational institutions, children encounter musico-linguistic structures and intuitively acquire the rules and principles (Stadler Elmer, 2015). The Song Leading research project emerged from a desire to create awareness of teaching songs in the classroom and was the catalyst for the development of a lesson transcription methodology in this domain. In this section, we present the research goals and explain the conceptual and technical principles of our audio-visual transcription methodology. We describe the LAMap as a graphic representation of song leading lessons and provide examples of its application.

The Song Leading Research Project: Heterogeneity and Complexity of Audio-Visual Data

The goal of the Song Leading research project is to examine the promotion of the cultural practice of singing together in educational institutions for children aged 4 to 8 years. Through singing in class, generalist teachers introduce children

to the musico-linguistic structures, rules and functions of this cultural practice. The research project aims to reconstruct the development of pre-service generalist teachers (PreGTs) and to capture the individual profiles of experienced generalist teachers (ExpGTs). Each project participant is asked to teach a new song in the classroom. In order to obtain examples of the existing practices, the ExpGTs' lessons were video recorded once, and the PreGTs' were recorded once each year during their three-year training course. The variety and complexity prompted the search for solutions to facilitate the conceptual and technical elaboration of the data in both individual and combined analyses. Field notes were made during lesson observations. Each lesson was video recorded and subsequently viewed by the researchers and the teachers. Thus, the video-recorded lessons informed the comments, reflections and teacher-researcher dialogue in the interviews.

The teachers' written reflections were then added to these data. These were responses to a personalised semi-structured questionnaire that teachers completed within a few months of the lesson recording. The processing of the audio-visual data was guided by the three-stage observation process. Field observation preceded the teachers' and researchers' viewing of the video recording during the interviews. This was followed by the researchers' subsequent repeated viewing of the recordings. These iterative observations preceded the reflection phase. The LAMap is the graphic result of a transcription methodology developed to facilitate the analysis of heterogenous data at various levels, to achieve the goals of the Song Leading research project.

Epistemological Processing of Song Leading Lesson Data: What Do We Transcribe?

Prior to the description of the LAMap, i.e., the graphic representation of a song leading lesson, the transcription principles underpinning the conceptual processing of the audio-visual data should be clarified. In the previous section, we introduced the general transcription principles related to the time-space dimension and the teacher-participant interactions. However, the sequentiality of both teacher's and children's actions is closely related to the lesson goals and content. The goal of song leading lessons is to teach new songs or to review previously introduced ones. The song and its musico-linguistic characteristics are therefore the domain-specific content. Consequently, the teaching and learning of the song generate several types of verbal and non-verbal interactions between the teachers and the children. For example, reciting lyrics or singing the song entails verbal interactions that are based on alternation or simultaneity principles, e.g., synchronisation. Similarly, conducting and semantic gestures or dancing and marching establish discipline-specific non-verbal interactions. The representation of the time-space dimension in the LAMap is based primarily on the visualisation of the song's musico-linguistic structure. Through the work on parts of the song or the entire song, teachers present it to the children as a model of musico-linguistic learning. The song is the primary component of the lesson; thus, this main information is needed to reconstruct the intentional organisation of the other activities.

The teachers aim to facilitate the comprehension and memorisation of a song that was new to the children. The identification of the teachers' segmentation and simplification strategies is essential. Therefore, we first considered the following question: "Which lesson activities should be transcribed?". The iterative observations of the lessons facilitated the identification of the recurring actions, which were found to be not only domain-specific activities but also consistently applied as transcription principles. The research on music teaching and learning reflects the lack of explicit and established methodologies and methods (Gebauer, 2011). Therefore, the progressive appropriation of the characteristics of the observed phenomenon informed the definition of the habitus of our transcription process, which is related to the goals and epistemological choices in the present study. The consistent approach to the technical elaboration of the lesson data is supported by the Song Leading Activities Key, the symbol and icon system developed for the study which is presented in the next paragraph.

Technical Processing of Song Leading Lesson Data: How Do We Transcribe It?

The technical data processing emerged from the epistemological and conceptual awareness of the connotations essential for the transcription of the song leading lessons. The transformation of the audio-visual information involves the visualisation of the song parts and elements (i.e., verses, melody and lyrics), the related activities and the teachers' plans for leading the children's actions in an interactive way (e.g., differentiated verbal and non-verbal exchanges). To ensure a consistent approach to the lesson transcriptions, we developed a symbol and icon system and defined the graphic space for the final presentation of the LAMap.

Table 1. Song Leading Activities Key.

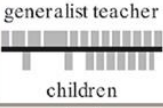









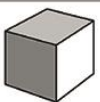




Song Leading Activities Key		
Symbols and Icons		Definitions
	speaking line	spoken communication between generalist teacher and children
	single verse	verse(s) of the target song momentarily not in focus
	single verse, melody and lyrics	singing with lyrics
	single verse, lyrics only	lyrics recited, i.e. verse metre is implicitly present
	single verse, melody only	singing the melody without lyrics by producing single syllables, e.g. la-la-la
	single verse, rhythm only	rhythm without lyrics or melody, expressed by body percussion or vocal sounds
	sounds with voice and body	sound production with the voice and/or the body without metre
	listening	instruction to listen attentively
	gestures or body percussion	gestures related to the lyrics' semantic content or metric sound production by body percussion
	movements	movements not related to the lyrics' semantic content (dancing, marching, etc.)
	material support	use of realia such as pictures, tissue paper, puppets etc.
	electronic devices	song reproduced or accompanied by digital support
	piano	use of instrument as song accompaniment or on its own
	guitar	use of instrument as song accompaniment or on its own
	percussion instruments	use of instrument as song accompaniment or on its own

Table 1 is the Song Leading Activities Key, the graphic representation of the metalanguage developed through reflection and selection. The development of this symbol and icon system was informed by iterative data analysis. In the previous paragraph, we emphasised the importance of identifying the content for graphic reconstruction of the lesson structure. The goal for a song lesson is the learning or review of a song; thus, the song represents the domain-specific content to be displayed on the LAMap.

A song is a complex type of content that is based on hierarchical musico-linguistic rules, such as how syllables are combined with a tune. The graphic representation of the song is based on the grammar of children's songs (Stadler Elmer, 2015). Children's songs are characterised by the vocal production of successive phrases (or verses) with or without a chorus. The coherence of the melody and lyrics is established by the metre and tonality. Consequently, a single verse is displayed as the minimum unit in the graphic representation (single-verse symbol). This illustrates the way in which teachers worked on the whole song or parts of it. Furthermore, the recurrent presentations of the songs can be defined by four modes: a single verse presented as melody and lyrics, lyrics only, melody only or rhythm only. Additional musico-linguistic properties, such as dynamics or tonality, are not displayed, and information about the presentation quality, such as tonal stability, is not provided. The limited number of symbols and icons on the LAMap is intended to provide an overview of a lesson and to provide a basis for further analysis (see Paragraph 3.5: "Applications of the Lesson Activities Map in the Song Leading Research Project").

Thus, a set of symbols and icons was designed which indicate definitions for categorising features of group singing lessons. This set facilitates to condense and graphically reduce the complexity of the audio-visual data preserving both the information about the temporal organisation and the variety of teachers' approaches. In fact, the presentation of the symbols and icons highlights the dynamics of how teachers organise activities. For example, the activities that occur only once, the activities that are repeated and the new activities that are combined with previous ones are shown. Thus, the LAMap preserves the personalised lesson structure and provides a context for subsequent analysis.

The Song Leading Activities Key was informed by the analysis of the PreGTs' first lessons. It should be noted that during the analysis of the second and third lessons, new activities emerged that demonstrate their acquisition of strategies and skills, such as the management of group work. In addition, further domain-specific approaches emerged from the ExpGTs' lessons. An example is conducting the song in order to guide the children. The generative nature of the Song Leading Activities Key creates challenges for researchers. The components can be extended to a wider range of activities; however, this is at the potential cost of intuitive readability. Although it is desirable to limit the number of symbols and icons to guarantee the abstraction of the relevant elements, the ongoing development of the Key will facilitate the integration of additional activities.

The Lesson Activities Map: Hierarchical Structure

Alongside the development of the Song Leading Activities Key, we experimented with various configurations of the symbols and icons in the graphic space. Thus, the LAMap is both analytical and communicative. As the name implies, the LAMap presents the data as a map. As is the case with a topographic map, the LAMap represents selected components to highlight essential information within a time-space dimension. Thus, abstractions and descriptive analyses can be performed in relation to the context by viewing the transcript of either an entire lesson or a section of a lesson.

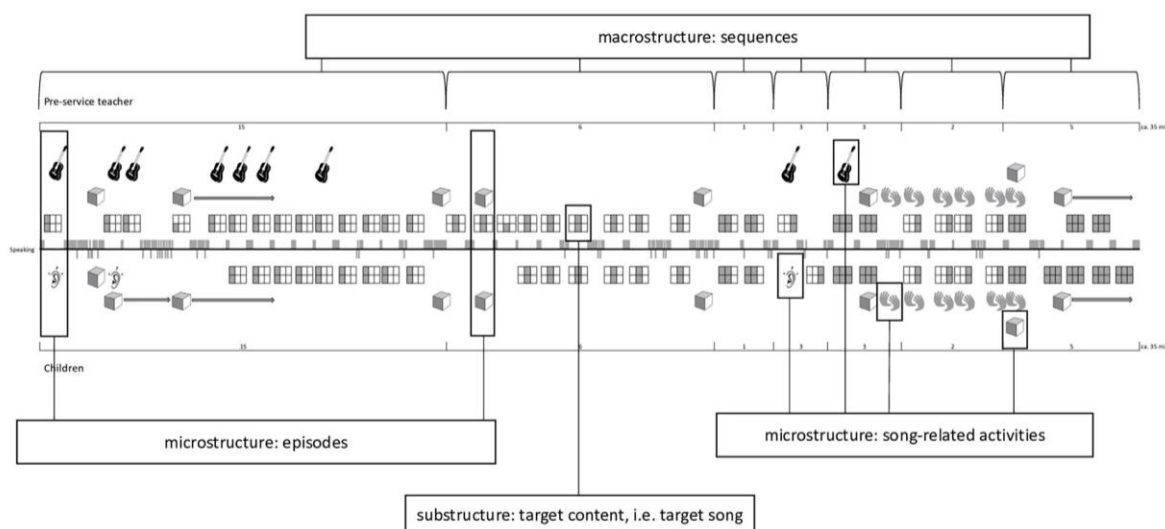


Figure 1. The hierarchical structure of the Lesson Activities Map (LAMap).

Figure 1 shows an example of the LAMap. The lesson sequence is represented horizontally in the macrostructure. The episodes that indicate the song and the related activities are represented vertically in the microstructure. The substructure of the LAMap highlights the musico-linguistic structure of the target song. As a result of the transcription process, the LAMap documents the simultaneous and/or turn-taking actions of both teacher and children based on the specific content. In a song leading lesson, this interaction is related to the teacher's approach to encouraging the children to learn a new song. Based on the musico-linguistic principles and rules of children's songs, we decided to visualise the structure of the song and how individual verses are presented. Indeed, the gradual approaches to teaching the songs - work on individual components (e.g., melody, lyrics), parts (e.g., single verse) or a run-through - highlight the hierarchical nature of teaching this subject. The hierarchy is reflected in the organisation of the LAMap, which distinguishes the substructure, microstructure and macrostructure. The musico-linguistic structure of the target song influences the hierarchy of activities and, thus, the substructure of the LAMap. The microstructure is generated by the organisation of the song-related activities, which are represented by symbols and icons.

At the microstructure level, the episodes are defined as the moments in the lesson where, at the same time as the song, a new activity starts or is added to ongoing activities. For example, in the lesson shown in Figure 1, the PreGT gave the children explicit instructions to listen carefully (listening icon) and subsequently provided a guitar accompaniment for their singing. To facilitate the understanding and memorisation of the lyrics, the teacher and the children worked with visual aids, such as images and tissue paper (material support icon). The lyrics were also staged with semantic gestures (gesture and/or body percussion icons). The transitions between episodes were characterised by the exchange of information, such as instructions, during subsequent teacher–children interactions. This is represented by the grey marks on the speaking line that intersects the LAMap horizontally (see Fig. 1). Furthermore, the speaking line is indispensable to the reconstruction of the interactivity. It bisects the graphic representation. The upper half shows the teachers' actions, and the lower half shows the actions elicited by the teacher's verbal and non-verbal requests[†].

At the macrostructure level, the approach to the song is displayed as temporal sequences that are often comprised of simultaneous activities. When the teacher focuses on selected verses and only the activities related to the chosen verse or the verses change, the individual episodes form a sequence. The sequences can be identified by the time intervals that frame the entire representation of the lesson and indicate the duration in minutes. Figure 1 shows the visualisation of the sequences in the teaching and learning of the target song, which is composed of three verses. The PreGT worked on each verse separately, reciting or singing the lyrics and gradually adding all the verses. Through the intuitive representation, the LAMap shows the teacher's confirmation of the children's acquisition of the new song by asking them to sing solo at the end of the lesson. The visualisation of lesson structures - macrostructure, microstructure, substructure - contributes to exploring whether the teachers' reflections during the interviews are oriented towards the overall organisation of the lesson, the leading and managing of simultaneous activities or the specific work on the target song.

To summarise, the LAMap shows the main structural components of the target song. It visualises the teachers' approach to having the children learn the entire song or specific parts of it. Through the interactive visualisation of the lesson participants, the LAMap illustrates the teachers' organisation of the domain-specific activities to intentionally encourage learning.

Applications of the Lesson Activities Map in the Song Leading Research Project

The LAMap is the graphic result of a transcription methodology developed for the systematic processing of data. After the reflection, selection and technical processing phases, the LAMap is used for visualising the data. It also provides a basis for further data analysis and dissemination. The lesson components, which were observed in the field and documented with audio-visual recordings, are intuitively shown on the LAMap. This creates descriptive and abstractive possibilities orientated to the research interests of a specific study.

This section presents examples of the application of the LAMap in the Song Leading research project. The LAMap was developed to visualise singing lessons in the classroom and to provide an overview of the related activities. However, its applications and the underlying transcription principles could be of interest for studies on the teaching–learning process in other disciplines in which elements are constructed into a whole, such as in arts education or the teaching to create new products. The transcription methodology was refined between the data collection sessions. Below is a brief report on the application of the LAMap:

- a) Analysis of the whole lesson (lesson overview)
- b) Analysis of the lesson parts (substructure, microstructure and macrostructure)
- c) Identification of points of interest (teachers' and researchers' perspectives)
- d) Identification of narrative associations

[†]Please note that to achieve the research goal, the development of the pre-service generalist teachers was reconstructed, and the profiles of the experienced generalist teachers were captured. Thus, the children's reactions were not gathered directly. They were reported by the teachers during the interviews.

e) Creation of contextual field notes

a) The LAMap provides an overview of a lesson. This supports researchers in the analysis of the PreGTs' professional skills and the ExpGTs' established teaching practices. Specifically, the LAMap facilitates the tracking of the differences in the lessons and the comparisons of the overall structures. For example, the exploration of the PreGTs' development over three years can highlight the similarities or differences, such as recurrent and refined patterns, in lesson structure. The first PreGTs' lessons generally contained a high number of simultaneous activities that often changed. The second lessons tended to present fewer activities that lasted longer. The increasingly personal approaches in the third lessons provided evidence of the PreGTs' emerging skills. The changes in the lesson structures were identified through the analysis of the PreGTs' dialogic reflections. Paragraphs (c) and (d) describe the contributions of the LAMap to the analysis of the interviews.

b) The hierarchical organisation of the LAMap supports the analysis of the lesson parts. For example, the sequences in the macrostructure illustrate the lesson structure. In the analysed lessons, the domain-specific content is the song. The LAMap macrostructure therefore shows the teachers' approaches to having the children learn each verse individually before gradually progressing to the entire song. At the microstructure level, i.e., a vertical reading of the LAMap, the episodes show the teachers' integration of the song with the related activities and make the goals and functions of the activities comprehensible and more intuitive. In addition, the substructure of the LAMap is established by the song's musico-linguistic structure. If the symbol for the song is presented as 'lyrics and melody', the visualisation of this substructure enables us to contextualise the song presentation during the analysis.

Figure 2. A contextualised musico-linguistic analysis.

Figure 2 shows the substructure of a single appearance of the song. It highlights the contextual musico-linguistic analysis. A graphic representation of the substructure facilitates an in-depth analysis of the teacher's modelling of the song. The Lesson Activities Map in the upper section provides an overview of the lesson and highlights two moments that were selected for analysis. A and B show the musico-linguistic analysis of the teacher's singing with and without guitar accompaniment.

c) The development of the LAMap offers practical solutions for the conceptual and technical processing of heterogeneous data. In fact, the complexity of the data related to a single case study necessitates multiple levels of analysis. The LAMap facilitates the descriptive analysis of the lesson content, including the related activities. In addition, it enables the analysis of the interviews. The interviews were conducted while the teachers and researchers viewed the video-recorded lessons together; thus, the analysis needs to be contextual. While watching the video, the teachers and researchers could pause the recording to comment on a subjectively relevant moment in the lesson. These "moments of interest" allowed for reflection and the integration of the dialogue between the teacher and the

researchers. So, the LAMap not only facilitates the description of the lesson but includes point-specific comments by the teacher from the interviews.

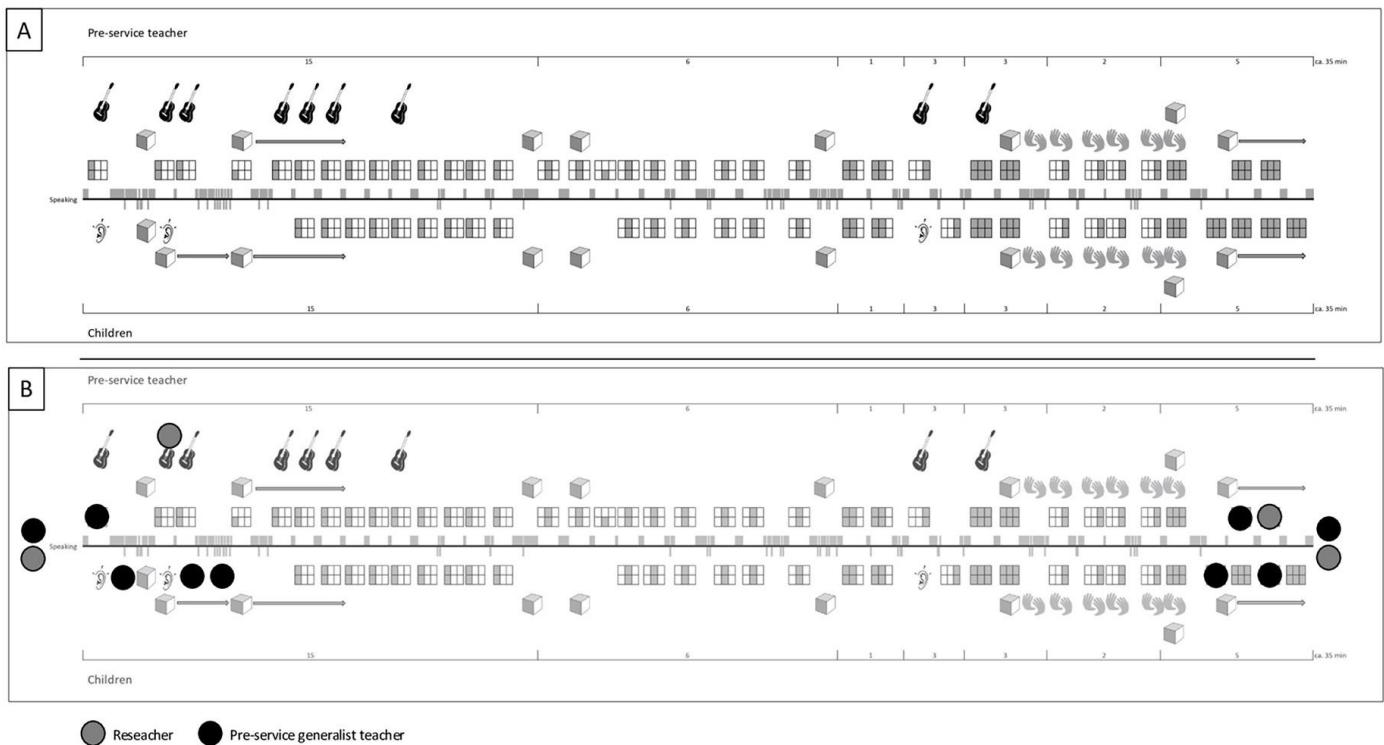


Figure 3. Selected moments while viewing the filmed lesson.

The LAMap (see Fig. 3) shows the PreGTs' points of interest during the viewing of a lesson that had just taken place. A shows the LAMap, and in B, the points represent the selected moments that the teachers and the researchers discussed while viewing the video recording of the lesson. This application of the LAMap helps to trace the teachers' development. For example, it facilitates the reconstruction of the process in which the PreGTs' focus shifts from classroom management to teaching content. The researchers' moments of interest can also be identified on the LAMap. This enables the comparison of the researchers' and the teachers' perspectives. The technical possibility of directly linking the points of interest in the LAMap to the interview content is currently being explored.

d) The analysis of the interviews revealed that the teachers' comments on the viewed lessons created narrative associations between the experiences in and beyond the lesson. For example, the teachers reflected on the similarities and differences in not only their lesson activities but also their previous experiences. In creating associations, the teachers shared their perspectives with the researchers and unconsciously provided narratives of their professionalism. The dialogical reflections of the video-recorded lessons also enabled the researchers to create narrative associations. As was done for the points of interest, these reflections can be indicated on the LAMap to facilitate the researchers' reconstruction of the narrative character of a case study. A coherent way to identify and to define the narrative associations and to thus indicate them on the LAMap is being explored. Consequently, an example of this application of the LAMap was not included in this article.

e) The development of the LAMap followed the collection of the data from the PreGTs' first lessons.

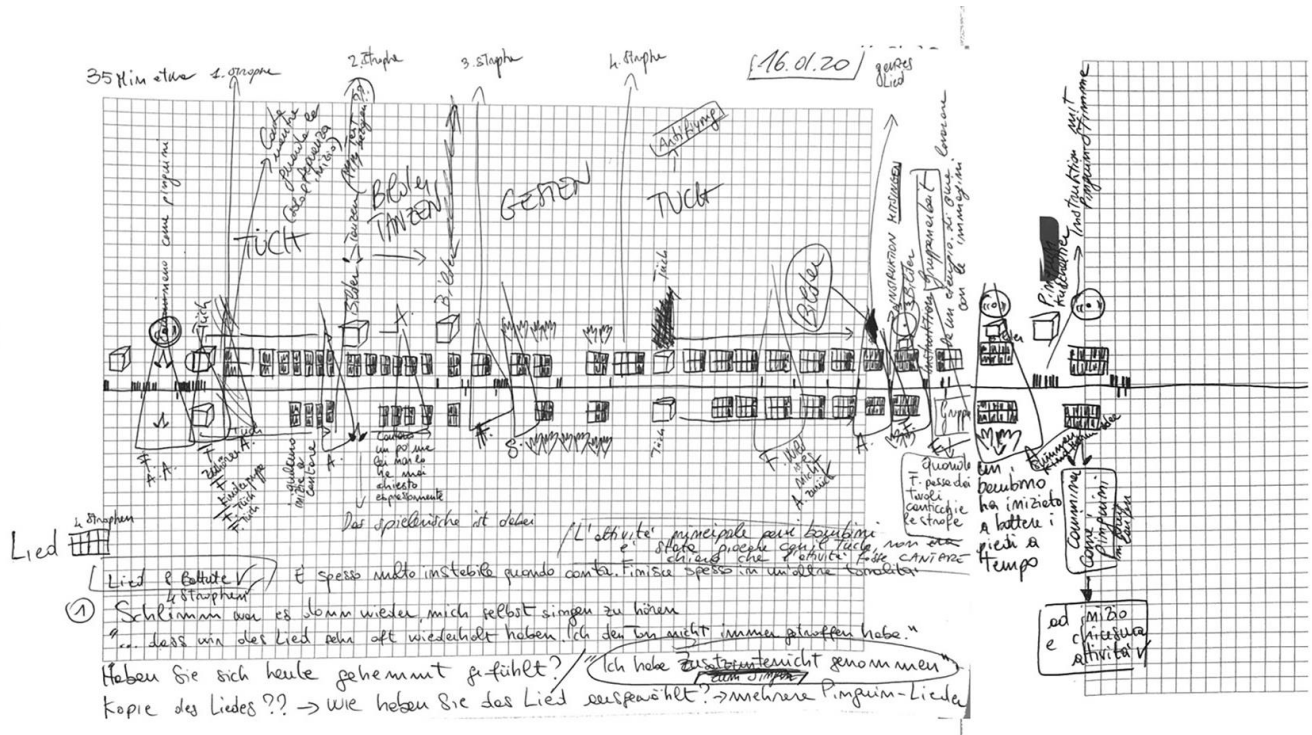


Figure 4. Hand-drawn Lesson Activities Map.

A hand-drawn version of the LAMap was begun during the field observation of the second sessions. It is constructed by researchers while observing a lesson and enables the creation of contextual field notes (see Fig. 4). Thus, the LAMap became an integral part of the data collection and allowed for the inclusion of the researchers' first impressions of the lesson. Tracing the LAMap during the observation of the phenomenon requires mastering the Song Leading Activities Key. The pace of the lesson that is observed requires the researchers' quick comprehension of the essence of the phenomenon and ability to represent it graphically in accordance with established transcription principles. In addition, the draft LAMap can be annotated during field observation. On their hand-drawn LAMaps, researchers can note questions for subsequent interviews and thus not lose sight of the context in which their reflections emerged. During the transcription of the recorded lessons, the hand-written draft was checked and corrected so that it could be used to improve the reliability of the LAMap.

Discussion

Recent research into multimodal transcriptions has focused on classroom interaction mostly to demonstrate how non-verbal interaction, such as actions or facial expressions, is combined with spoken language (e.g., Taylor, 2014). The graphic result of multimodal transcription methodologies usually represents non-verbal and verbal interaction with text and shows both, the time dimension and the simultaneity of actions, in a table (e.g., Cowan, 2014). The need for conventions in lesson transcriptions has been highlighted (e.g., Hackling et al., 2014) but a prevalent issue is that these conventions must be subject related. Current research is concerned with subjects other than music, in particular science lessons (Taylor, 2014), so the most suitable methodology for our need to transcribe song leading lessons was the Feldpartitur by Moritz (2011). The conceptual design of the LAMap was inspired partly by this video transcription software.

This software facilitates the transcription, analysis and archiving of audio-video recordings in qualitative research in the humanities and social sciences. The documentation of the continuity and simultaneity of individual or group actions is the guiding principle. The idea behind this software came from the system of musical notation. Consequently, the horizontal reading of the score represents the temporal continuity of the instrument parts, and the vertical reading provides information on the simultaneity of their intervention. In a similar way, the chronological sequences of the approach to the song are indicated horizontally on the LAMap, and the visualisation of the simultaneity between the song and the related activities is presented vertically.

Feldpartitur is an innovative approach to video transcription. Speech is converted to text, and other information is represented by symbols and icons. These symbols and icons can be freely selected. They are part of an established semantic system provided by the software; however, they did not allow for the graphic representation of the song. For this reason, transcribing the lessons of our Song Leading project with Feldpartitur would not allow us the visualisation

of the musico-linguistic structures. Furthermore, in Feldpartitur, it is advisable to process audio-visual data for a maximum of approximately 4 minutes, whereas we need to get an overview of lessons lasting 30 to 40 minutes.

In terms of the time-space organisation, the need to keep the focus on the target song prompted the search for an alternative transcription system. The song is the recurring element that needs to be visualised so that the teachers' work on parts and the whole song could be analysed. Most children's songs are shorter than 2 minutes, and a verse lasts approximately 30 seconds. Thus, the main problem was the representation of the smallest unit of time as the predominant graphic unit. For this reason, the symbol of the song was established as the key element that determines the composition of the LAMap. The decision was based on the time-space organisation. The idea of a timeline to show the direct relationship between time and actions was abandoned in favour of the representation of the time-space organisation in sequences that indicated the duration. Thus, not only does the LAMap provide a visualisation of the duration-activity relationship, but it does so in a compact graphic format that avoids visual overload.

This decision had other advantages. The LAMap was created in Microsoft Excel, which presented some difficulties for determining the sizes of the symbols and icons. The representation of time as the total duration of the activities in the sequences had already optimised the graphic efficiency of the LAMap. This facilitated the compression of the lesson moments and the visualisation of longer lessons. Microsoft Excel is not optimal for transcription; however, it allowed for the manual modelling of the LAMap to achieve the research goals.

Conclusion

In education research, lesson observation can facilitate analysis of the teaching-learning process. Field observations can be supplemented with audio-video recordings. The final data would contain heterogeneous information that could be further explored on the basis of the researchers' interests. They can be also be preserved through transcriptions, namely in the written form of the phenomenon observed in a precise time-space context. Transcriptions provide visual support for the analysis of simultaneously occurring elements. However, the realisation of a transcription implies the conceptual and technical elaboration of the data on the basis of theoretical principles, epistemological choices and the study goals.

This article has presented the LAMap as a graphic reconstruction of domain-specific lessons. The variety in the audio-visual data collected for the Song Leading research project led to a search for solutions suitable for individual and combined analyses to reconstruct the development of the PreGTs and to capture the individual profiles of the ExpGTs. The methodology in this study was informed by general principles common to various domains and on domain-specific transcription principles. The graphic organisation of the time-space dimension was defined, and the participants' interactions was represented. Furthermore, to highlight the distinctive features of classroom singing, the hierarchical structures of the lessons were visualised.

For a consistent approach to the transcription of song leading lessons, the Song Leading Activities Key was created. It is a symbol and icon system based on knowledge of the grammar of children's songs and on the identification of the related activities that are specific to and characteristic of individual teachers. Thus, the LAMap facilitates the visualisation of the elements of the musico-linguistic structure of a song and the teachers' segmentation and simplification strategies. The hierarchical nature of song teaching is graphically represented at three levels: the macrostructure, microstructure and substructure. The macrostructure highlights the sequential approaches to the teaching and learning of parts of the song or the whole song. A vertical reading of the LAMap provides access to the microstructure, which is defined as the episodes and representation of how teachers organise the song-related activities that promote the children's involvement. The substructure represents the song's musico-linguistic structure and facilitates the visualisation of the four recurrent modes of the presentation of the song: melody and lyrics, lyrics only, melody only or rhythm only. The symbols and icons in the Song Leading Activities Key condense and graphically reduce the complexity of the audio-visual data while preserving the information about the variety in the teachers' approaches.

The LAMap provides a representative overview of the observed lesson and serves as a tool for subsequent descriptive and theoretical analyses. It facilitates the transcription of a variety of song leading lessons by allowing for the processing of complex audio-video data while preserving the context. The LAMap allows for not only the analysis of the lessons as a whole and in its parts, but also the tracing of the teachers' moments of interest identified during the interviews in which the lessons were viewed. The narrativity of each case study can be reconstructed through the identification of the narrative associations created by the teachers in their reflections on the lessons and dialogue with the researchers.

The LAMap is an integral part of the field notes in the Song Leading project. It is hand-drawn during the lesson and contributes to the notes that are prepared for the interviews. The design and the transcription methodology complement the project. The LAMap is the graphic result of a systematic approach to the transcription of song leading lessons.

Recommendations

Our basic idea for the LAMap can inform future research on the teaching–learning process in song leading and can contribute to the further development of transcription of lessons in specific domains. In the future, in addition to being used for scientific analysis and dissemination, the LAMap could be integrated into teacher training and continuing education courses. It could create opportunities for information sharing between peers, between pre-service and experienced teachers or between generalist and specialist teachers. Familiarity with the habitus of the discipline would enable teachers to create the LAMap. The set of symbols and icons, which emphasises the domain-specific activities, can build confidence in the subject matter and contribute to the internalisation of the activities. In viewing the lesson recordings, the teachers can identify and experience the changes in their professional practices. It may be desirable to develop software that accelerates the transcription process, provides an overview of the entire lesson and allows for the selection of individual moments for analysis.

Limitations

At the current stage of the development of the LAMap, the definition of coherent transcription principles for the spoken communication as traced on the speaking line is still under discussion. Regarding the Song Leading Activities Key, limiting the number of symbols and icons to facilitate the intuitive readability of the LAMap was considered. This should not be considered a limitation as the generative nature of such a metalinguistic system allows the Song Leading Activities Key to be flexibly adapted.

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