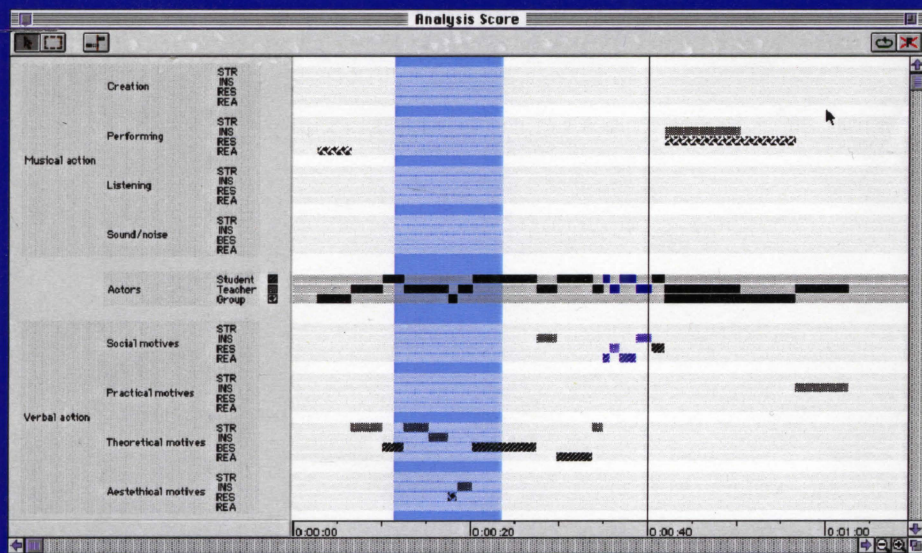


Qualitative Process Analysis Tool



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QPAT

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Background. The development of media and information technology, together with the transformation of music production in society, has radically changed the conditions for music education on all levels. There is a great demand within the undergraduate education of music teachers for developing knowledge about the possibilities of computer technology, as well as obtaining practical experience of the new technology in connection with music education. The current transition of the governing system of Swedish schools – from control by regulation to control by goal setting and result evaluation – requires efficient evaluation techniques and a model for process analysis of music teaching.

A new analysis instrument for studies of pedagogical processes is currently being developed at the Royal University College of Music in Stockholm (KMH), Center for Research in Music Education (MPC). The basic idea is to depict education processes graphically in a handy and lucid way by means of a so-called *analysis score*. In such a score – whose name derives from an analogy with musical notation – markings in the vertical direction indicate what is taking place in the classroom at a particular moment, with respect to *who* is acting *what* (s)he is doing, what the *function* of the action is, etc. The score's horizontal axis represents time, giving a schematic representation of the entire pedagogical process, rather like in a time/space diagram. To this graphical method is added a theoretical framework, as well as a model of interpretation for educational processes, based on earlier research.

Today, the task of producing a complete analysis score, starting with nothing but an audio or audio/video recording of a lesson, is a laborious and time-consuming one, involving several stages. First, a transcription is made, where the actions (including utterances/speech acts) of various agents are taken down in writing. An interpreter then classifies these actions according to a certain category scheme, codifying and entering the classifications into the transcription. After this, time annotations must be entered into the text, whereupon the information is finally rendered in graphical form at the computer using an ordinary drawing application. These graphical descriptions of lessons can then serve as a valuable aid in understanding education processes. (See fig. 1.)

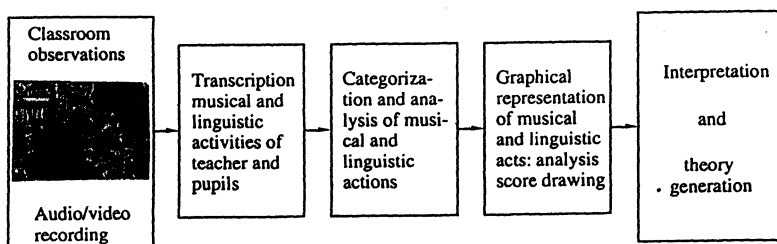


Figure 1. The traditional method of studying education processes using the technique of analysis scores.

Problems with the traditional method. As described above, the route from audio/video tape to completed analysis score may seem pretty straight and unproblematic – apart from categorization, it is always “only” a matter of transferring information from one medium to another: original recording, written protocol, and analysis score. However, the procedure is not as straight-forward as it may seem at first sight. There is often the problem, arising in the process of categorization as well as in drawing the analysis score, that the information transferred from earlier stages turns out to be insufficient, forcing the analyst time and again to go back to the original source, i. e., the recording, in order to make necessary corrections and additions.

This is not simply a matter of care and precision; when the problem arises, it is not due to laxness on the part of the researchers. The trouble is, rather, that the different stages (transcription, categorization, and score drawing) require different kinds of information in order to be carried out. Details which may seem negligible during transcription (e. g., does A commence his/her speech act before or after B is finished talking?) may turn out to be vital for categorization (is A’s utterance a response to that of B?) – and the same goes for the score drawing stage. The problems are aggravated if, for reasons practical or otherwise, different stages in the process must be performed by different persons; we are always dealing with interpretations, and different people tend to

interpret the same thing in different ways. In addition to these difficulties, the tasks involved in the process of analysis are often very laborious; intellectually unstimulating, yet demanding a high level of concentration.

Introducing QPAT. QPAT (Qualitative Process Analysis Tool) has been constructed in order to cope with the problems described above, to facilitate the study of audio/video recordings of pedagogical processes and render it more efficient and enjoyable for the researcher. This is achieved in two ways:

1) QPAT is specifically designed to deal with the kinds of graphical operations required to produce an analysis score, allowing the researcher to concentrate more on *what* (s)he wants to do, rather than *how* to do it.

2) The different representations of dynamical processes (viz., original recording, text annotations, analysis score) are presented simultaneously and in an integrated fashion on a computer screen. This enables the analyst without effort to shift perspective whenever (s)he wishes, resulting in a more complete understanding of what is really going on in the classroom. Thus the border is softened between pure data processing on one hand, and reflection, interpretation, and theory generation on the other.

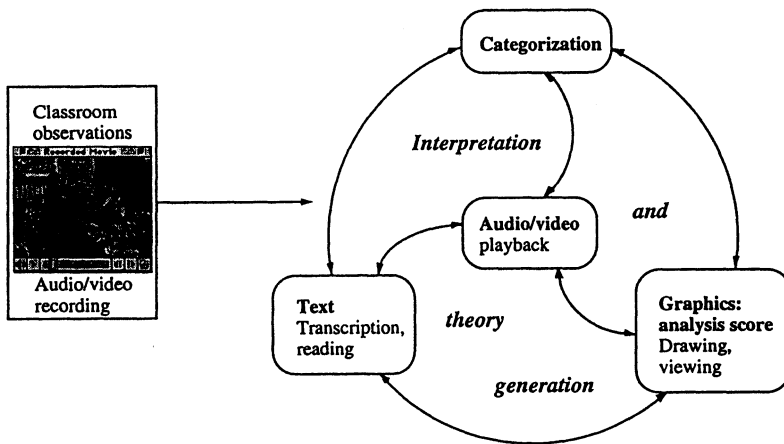


Figure 2. The QPAT method of studying education processes.

Function of QPAT. QPAT permits the user to study an audio/video recording from several different perspectives simultaneously. Firstly, the recording itself is present on, and its playback is controlled from, the computer screen. At present, this requires having the recording in a digitized QuickTime format, but the QPAT application will, in the near future, be able to deal with recordings stored on ordinary video tape.

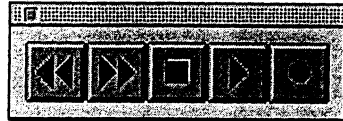
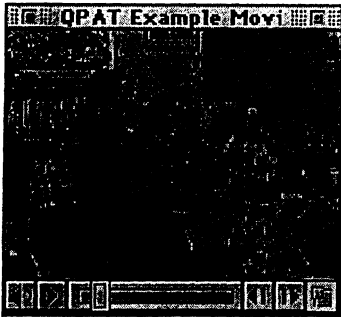


Figure 3. Video window and playback control buttons

While running QPAT, a second window is open containing the analysis score. The score can be regarded at many different levels of resolution, ranging from a general overview of an entire 30-minute lesson down to sub-second precision. The score can always be edited at will. We have taken pains to make this editing process as simple, efficient, and intuitive as possible. Graphical annotations, indicating categorizations, are entered using the mouse, and, if desired, the program automatically adjusts markings to fit precisely into one another.

The mode of data entry can be adjusted to fit different requirements on the speed and precision of the categorization process. If the relative emphasis is on speed of execution rather than split-second accuracy, categorization can be performed in real-time, i. e. simultaneously with audio/video playback of the recording. If greater precision is required, or a large number of independent dimensions of coding are involved, it may be preferable to concentrate on one smaller interval at a time, successively filling in more details and making finer adjustments. To this end, we have implemented a function which repeatedly plays back a short interval of the recording, thus enabling the user to conceive a

dynamic sequence of event simultaneously, and, as it were, in a single picture. This mental picture can of course be transferred to the score without interfering with the playback loop.

As for textual annotations, a special window permits the user to enter and edit comments, explications, ratings etc. for each individual event.

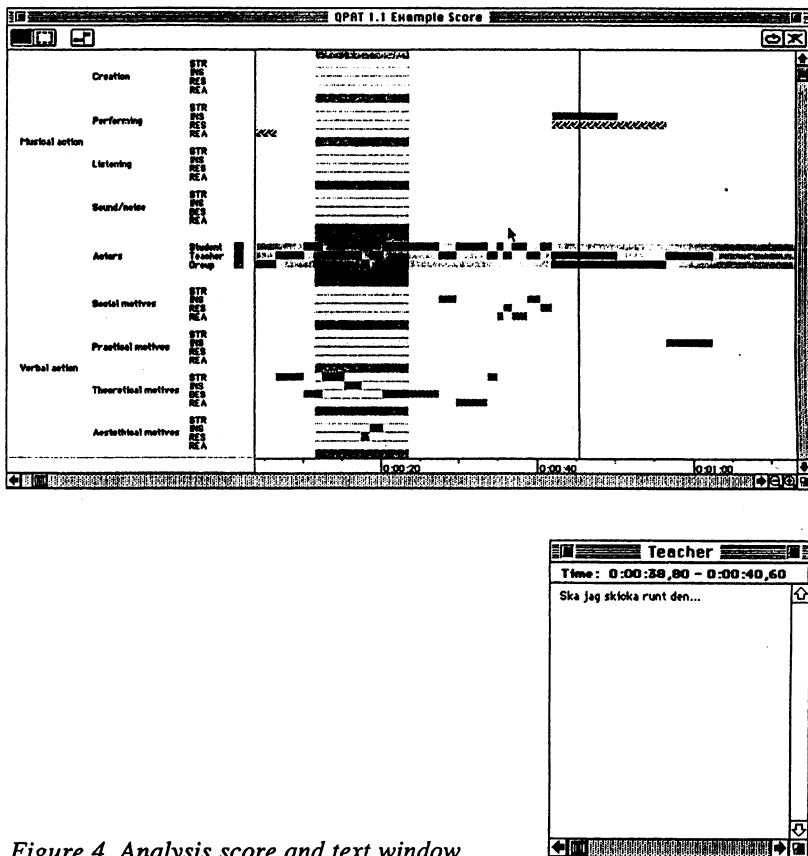


Figure 4. Analysis score and text window

These different elements – recording, analysis score, and textual annotations – are presented to the user in a synchronized and integrated fashion; when a segment of the recording is played back, the

corresponding part of the score is automatically displayed, a vertical line indicating the present moment. Conversely, it is possible to select a certain segment of the score and have the corresponding interval of the recording played back. Textual annotations are displayed at the moment the corresponding event takes place; score markings corresponding to the same event are always moved and edited together, etc.

Applications. QPAT is intended for use in various settings. On one hand, it can be used in pedagogical research as an aid in data analysis and theorizing. On the other, nothing stands in the way of individual teachers' using it as a basis for self-evaluation or in discussions of different teaching strategies.

Although QPAT was originally conceived as a tool for pedagogical research, its range of application is by no means restricted to the field of education. On the contrary, it is our belief that anyone using the techniques of coding and categorization in the study of dynamic, qualitative processes will benefit from the increased ease and precision with which such tasks can be performed using QPAT. Some examples of potential areas of application are: political debates, everyday conversation, drama rehearsals, jazz improvisation ... you name it!

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