

# MUSIC LEARNING SEQUENCES BASED ON COGNITIVE APPRENTICESHIP – DEVELOPMENT AND EMPIRICAL EVALUATION

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## ABSTRACT

Students are often not interested in music lessons at school despite their tremendous music interest in their private lives. So general music teachers have to attract their students' attention by creating interesting learning situations. This paper focuses on the problem which factors first of all cause interest – or its lack – in music instruction: the subject, the topic, the teacher, the school, the students or others?

Within current educational psychology, the concept of Cognitive Apprenticeship (CA) explores teaching arrangements oriented in students' interest, trying to activate autonomous learning in teams, combining constructive and instructive strategies. Following the example of other subjects, CA will be applied here as a "prescriptive", practical suitable theory to music education.

To intensify students' classroom experience and achievement, exemplary 'CA lessons' were be worked out, tested in real classroom settings, and empirically evaluated as to their effects on the students' interest and competence. The results insinuate the predominant importance of students' activity.

## 1. MAIN ISSUE OF THE PRE-STUDY

The questionnaire used for the present pre-study asks which of the following factors is responsible for the students' positive evaluation of a music lesson and to which degree: Age, sex, extracurricular music interest, (general or singular) interest in the subject of music, appreciation of the teacher, interest in the topic, fancy for the music examples, grade of activity, desire of continuing classroom activities, sense of achievement.

## 2. THEORETICAL BACKGROUND

The study bases specially on the following theoretical concepts.

### 2.1 "Münchener Interessentheorie"

Since 1981 **Ulrich Schiefele** is investigating the effect of interest on learning and achievement. He describes the condition of an interested student by four basic experiences (Schiefele, pp. 107):

1. feeling *active* and animated,
2. wishing to continue actual *activity*,
3. experiencing *success*,
4. positive sense of their *capabilities*.

These factors will be used to evaluate the students' quality of experience in class.

### 2.2 Cognitive apprenticeship

"Cognitive apprenticeship is one example of situated learning in which learners participate in a community of practice that is developed through activity and social interaction, in ways similar to that in craft apprenticeships" (McLellan 1994). "Observing the processes by which an expert listener or reader thinks and practices these skills can teach students to learn on their own more skilfully" (Collins, Brown, Newman, 1989, p. 457-548). The CA method includes:

- Modelling - an expert is carrying out a task so that the student can observe the processes required to accomplish it.
- Coaching - consists of observing students while they carry out a task and of offering hints, feedback, modelling, reminders, etc.
- Articulation - includes any method of getting students to articulate their knowledge, reasoning, or problem-solving processes.
- Reflection - enables students to compare their own problem-solving processes with those of an expert or another student.
- Exploration - involves pushing students into a mode of problem solving on their own. Forcing them to do exploration is critical, if they are to learn how to frame questions or problems that are interesting and that they can solve (Collins, Brown, Newman, 1989, 481-482).

### 2.3 Edwin E. Gordon, Wilfried Gruhn

As he points out e.g. in his *Learning Sequences in Music*, **Edwin E. Gordon** considers the development of inner sound imagination ('audiation') by practical activities as a fundamental objective of music education. **Wilfried Gruhn** defends this concept opposing it to a theory-based type of teaching which may be frequently used in German *Gymnasium* (high-schools).

The project presented in this paper supports the focus on ear training and musical practice as it seems to be the only way to provide musical understanding. It will not exclude any kind of theoretical reflection or instruction, but will present it according to the didactic principles of CA, too.

### 3. HYPOTHESIS

To operationalize the study's objective, three hypothesis were formulated.

The first hypothesis postulates that the students' positive evaluation of an instructional unity correlates with the intensity of their participation in class.

The second hypothesis says that the students' evaluation of instruction has more to do with their evaluation of classroom activities than that of the teacher or the subject.

The third hypothesis finally postulates that learning effects correlate with the students' acceptance of instruction - measured by their own evaluation.

### 4. INSTRUMENT

The empirical investigation - realised in a German *Gymnasium* - is based on a self-designed questionnaire inquiring - beyond general data (age, sex, grade, date, time of the day) - information concerning the following six items:

1. Students' general interest in music at school and in their free time, musical activities (instrumental, choral);
2. Evaluation of the last four week's ('usual') music instruction and today's ('CA') lesson;
3. Ratings of the teacher (personal, pedagogical and specialist abilities)
4. Interest in the subject and fancy for the music dealt with in class;
5. Type of classroom activity and opportunity given to work autonomously;
6. Determining factors of interest in today's music lesson (animation to participate, wish to continue classroom activities, assessment of learning effects, sense of success)

It reaches for two temporal measuring points ('normally' opposite to 'today').

## 5. PLANNING CA BASED MUSIC LESSONS

### 5.1. Possibilities to apply CA to general music instruction

The method of Cognitive Apprenticeship may be applied to various activities in general music instruction, as the following examples show.

Singing or playing by ear. Students sing a song of their own choice by listening to the record. They find out fitting 'grooves', riffs, intros, chords and play it on classroom instruments.

Singing or playing by score. In teamwork the students develop autonomously their own strategy of learning to play or to sing a song or instrumental part from a music score.

Improvisation, e.g. Blues-Improvisation. 'Modelling' is an obvious teaching method to show how to improvise on a given scale.

Computing Music. In its practical, student oriented, autonomous approach, CA is an ideal theory for all kind of creative or analytic tasks to be carried out on music computers.

As it is not restricted to music instruction, CA can also be applied to theoretic or historic matters.

### 5.2. Some lesson plan examples

The first lesson type in lower courses concentrated on the objective of encouraging and enabling the students to realise musical scores on their own.

#### Educational objectives

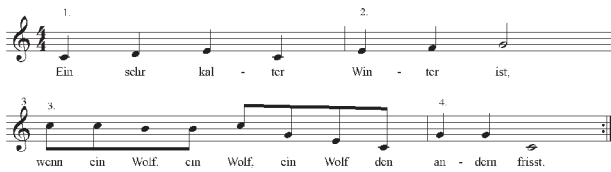
- To develop the ability to collaborate in small teams (social learning)
- To find and to log a strategy to realise a musical score (work methods)
- To repeat the names and duration of notes and breaks (specialised knowledge in music)
- To realise a rhythm noted in score correctly (rhythmic audiation)
- To play the melody on a classroom instrument (psychomotor)
- To sing the played melody (imitation / audiation of pitches and rhythm)
- To present the strategy and the sounding result in class

#### Lesson plan

In small teams students try to find out on their own how the score is to be played either with one Orff instrument per group or with soprano recorders for each student. Work methods are discussed in every team and logged by a 'secretary' student (articulation). The teacher helps by modelling and coaching.

Ein sehr kalter Winter ist

(Volkslied)



Example 1: (5<sup>th</sup> grade) C major scale and chord

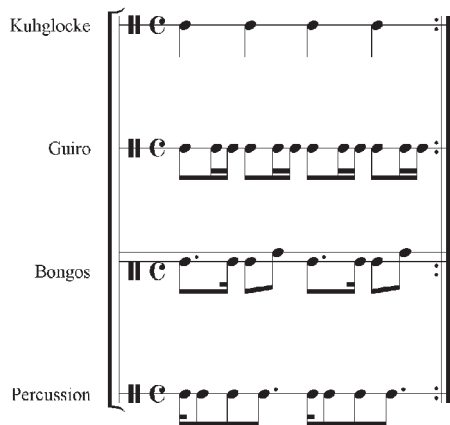
Swingin' Friday

A. Conrady



Example 2: (6<sup>th</sup> grade) Major and minor chords in C major

The second lesson type mixed practical and theoretic objectives.



Example 3: (10<sup>th</sup> grade) 'Afro-latin music'

Educational objectives

- Getting familiar with afro-american music from Latin America
- Creative assimilation of textual information
- Correct performance of a scored rhythm
- Presentation of the results

Classroom activities

- To arrange a crossword puzzle with concepts of a class book text („E Macumbabebe“, Spielpläne Musik 7/8, p. 64f.) and to ask the corresponding questions.
- To realise and to practice autonomously some rhythm-patterns of Merengue by score.

Crossword Puzzle – The task

Build a crossword puzzle out of the following 7 terms of Brazilian Capoeira and ask the according questions (Macumba, Atabaque, Berimbau, Agogo, Caxixi, Capoeira, Tumba)!

3. EVALUATING MOTIVATION AND ACHIEVEMENT

The investigation was realised in three 5<sup>th</sup> grade, one 6<sup>th</sup> grade, two 9<sup>th</sup> grade and one 10<sup>th</sup> grade courses of a Gymnasium in the south of Germany, where the author is working. The 133 test persons (64 male, 62 female, 7 without corresponding data) participating in the study belonged to three age groups:

1. 1, 101 students in the age of 10 – 12 (grade 5/6),
2. 2, 18 students in the age of 14 – 15 (grade 8/9),
3. 3, 14 students in the age of 16 – 17 (grade 9/10).

4. RESULTS

4.1 General factors of music interest

Music interest in private live and at school

Age group (years)	Instru-ment (%)	Chorus (%)	Music interest in free time (5 point scale)	Music interest at school (5 point scale)
10-12	54,5	15,8	2,03	2,04
♀	60,9	28,3	2,11	2,3
♂	51,7	17,2	1,98	1,88
14-15	36,8 %	10,5 %	1,79	2,42
♀	22,2	0	1,67	2,33
♂	50	20	1,9	2,5
16-17	21,4 %	7,1 %	1,5	2,79
♀	25	12,5	1,5	2,5
♂	16,7	0	1,5	3,17

Table 1: General factors of music interest

Music interest in free time raises equally in boys and girls. Music interest at school is continually getting worse in boys while it stays relatively constant in girls. With increasing age private and school music interest increasingly diverges. This tendency affects the 16-17 year old boys more (difference 1,67 points on the 5 point scale) than the girls of the same age (difference 1,0).

### The teachers' influence on music interest at school

Between music interest at school and teacher evaluation could be found the following correlation coefficients (significant on level 0,01):

- Music interest at school / teacher's specialised knowledge ( $r = .418$ )
- Music interest at school / teacher's personal qualities ( $r = .598$ )
- Music interest at school / teacher's qualities as an educator ( $r = .623$ )

This shows that music teachers' social sensibility is more important to the students than their ability to play the piano, but that it is most important for them to be good teachers.

## 4.2 Lesson specific interest factors

'CA lessons' with intense student participation have been evaluated 0,52 (of 5) points better than 'usual' music teaching.

The evaluation mark of 'CA lessons' (1,62) surmounts the average music interest in students' free time (1,96).

Age group	Usual lessons		Today's lesson		Difference (MS-MH)	
10 – 12 years	2,0891		1,4851		0,604	
	2,0862 “	2,2826 !	1,5172 “	1,4348 !	0,5690 “	0,8478 !
14 – 15 years	2,3889		2,0556		0,3333	
	2,3333 “	2,4444 !	2,2222 “	1,8889 !	0,1111 “	0,5555 !
16 – 17 years	2,1429		2,0714		0,0715	
	2,3333 “	2,0000 !	2,500 “	1,7500 !	-0,1667 “	0,2500 !

**Table 2:** Comparing usual and today's lesson

Today's ('CA') lessons have been evaluated in all age groups better than 'normal' music teaching. The only exception made 16-17 year old boys evaluating these lessons a little bit worse (-0,17). The younger students perceive the difference bigger (0,6) than the elder (0,07). The girls evaluate the 'CA lessons' throughout better than the boys.

## 5. SYNTHESIS

The first hypothesis postulated that the more intensely a particular learning group is participating during the instruction, the better it will evaluate this lesson. 'CA lessons' with intense student participation have been evaluated 0,5177 (of 5) points better than usual music teaching.

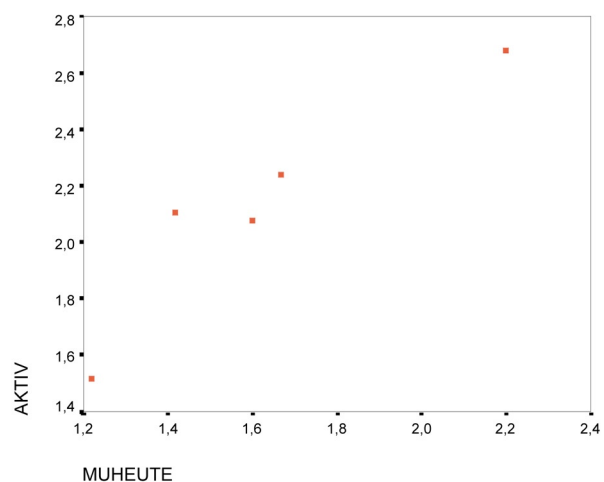
The second hypothesis said that the students' evaluation of instruction correlates with their evaluation of classroom activities rather than with that of the teacher or the subject. To point out a clear result, questionnaire items were added up into three purviews:

- Concerning classroom activities (AKTIV)
- Concerning teacher (LEHR)
- Concerning subject (THEMA)

Between 'CA lessons' (MUHEUTE) and subject items (THEMA) no significant correlation could be found ( $r = .404$ ).

Between 'CA lessons' (MUHEUTE) and teacher concerned items (LEHR) there was only a tendency of significant correlation ( $r = .815$ ).

The only significant correlation could be found between 'CA lessons' (MUHEUTE) and the items concerning students' classroom activity (AKTIV) ( $r = .950$ , significant on level 0,01).



**Figure 1:** Correlation between the evaluation of a 'CA lesson' (MUHEUTE) and students' activity (AKTIV)

## 6. DISCUSSION

Within the limits of this pre-study, the hypothesis concerning the significance of intense participation for positive evaluation of instruction on the part of the students may be considered as proved.

To realise a research project to validate these results, the investigation design should be modified or amplified in some aspects. A shorter and more precise instrument must be designed in order to take a series of data measuring correlation between the students' lesson-evaluation and activity.

There must be developed validated methods to assess learning effects obtained by CA based lessons during a larger period of time.

## 7. CONCLUSION

Considering the didactic problem to create interesting learning situations in general music, this pre-study shows that students' active participation is the key for their positive classroom experience and achievement, rather than the attraction of the teacher or the subject. The application of CA principles served to work out activating music lessons that focus on a real problem taken from the expert culture to be solved by the students autonomously and in team work. The teacher intervenes only to show in an exemplary way how the tasks might be carried out.

Further research would have to substantiate these results by defining more precisely the application of CA principles on music education and by collecting more data concerning the relationship between students' activity and their evaluation of instruction. The question could not be answered within this pre-study which objective effect do the described classroom activities produce on students' learning and achievement.

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