

DIDACTIC CHALLENGES IV:
FUTURES STUDIES IN EDUCATION

Conference Proceedings

EDITORS:

SOHAIL INAYATULLAH

SNJEŽANA DUBOVICKI

ANICA BILIĆ

Publisher:

Josip Juraj Strossmayer University of Osijek
Faculty of Education, Osijek, Croatia

Co-publisher:

Croatian Academy of Sciences and Arts, The Center for Scientific Work in Vinkovci

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Layout: Studio HS internet d.o.o. Osijek

Printing: Studio HS internet d.o.o. Osijek

ISBN 978-953-8371-15-8

Josip Juraj Strossmayer University of Osijek



The approval for the publication of this proceedings was given by the Senate of the Josip Juraj Strossmayer University of Osijek at the 8. session held on June 6 2023 under the number: 8/23.

CIP record is available in the computer catalogue of the City and University Library in Osijek under number 150806096.

Print run: 250

Didactic Challenges

International Scientific Conference

DIDACTIC CHALLENGES IV: FUTURES STUDIES IN EDUCATION

Osijek, 26-27 May 2022

CONFERENCE PROCEEDINGS

EDITORS:

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Osijek, April, 2023

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All submitted papers have been individually reviewed in an anonymous double-blind peer review process, on basis of which the editors have decided about their publication in the conference proceedings.

FOREWORD

This book is both broad and focused. There are numerous chapters on particular issues in education – bullying, music, mathematics, sports, and health care, for example – however, the intent of this book is to help understand how education is changing. Many have argued that education in that it must uphold the needs of multiple stakeholders (parents, students, teachers, the community, the Ministry, local municipalities) cannot change. It will always remain behind business and government. While we do not challenge the backwards nature of education – focused on generally the canon of what happened – this book seeks to move from educational reform (marginal change) to begin to imagine what education can become. COVID-19 forced schools to become far more adaptive and agile, moving quickly toward virtual education. Moreover, educational institutions quickly understand that it was not just addressing the pandemic through new technologies that was important but creating a culture of well-being, and most importantly of trust. The future which seemed far away suddenly became the present

More shocks are in store as technology, the aging of society, global shifts in political hegemony, bioinformatics change what is possible. This book is about preparing us for this changes, making the far way future not so distance but as a possibility, so we can better address the changing needs of students. They will most likely wish to own their own data, have access to their digital twin, expect to move seamless between local, national and global environments as well as between nature, technology and the built environments. We hope this book can help prepare educators throughout the world as we transition from away from the industrial era. Our challenge is make leaps in imagination not to be right but to help create a learning journey for all.

Editors

RELATIONSHIP BETWEEN MOTIVATION AND SELF-EFFICACY WITH THE ACQUISITION OF MUSICAL COMPETENCIES IN STUDENTS OF TEACHER EDUCATION

Original scientific paper

UDC: 371.12:[78:371.3]

Lidija Nikolić

Faculty of Education, University of Osijek, Republic of Croatia

Abstract

Teachers' poor self-confidence in teaching music is a universal problem, usually attributed to the teacher's lack of musical competence. However, the causes can be sought in the complex process of music education that begins as late as adolescence, in teacher education curriculum, as well as in the psychological factors that accompany learning. The aim of this study is to determine the relationship between motivation and self-efficacy in music education training among students of teacher education and their success in acquiring and developing musical competencies. A longitudinal empirical study was conducted with students of teacher education (N = 105). For the study, a *Questionnaire on motivation and self-efficacy for learning music in students of teacher education* was designed to measure students' motivation and self-efficacy in music prior to vocal and instrumental courses. At the end of the academic year, students' success in acquiring specific musical competencies was assessed. The results of this quantitative study showed that motivation to learn music and self-efficacy in music were related to success in acquiring the musical skills of singing and playing, but not to the acquisition of music knowledge. In addition, the psychological predictor of success in singing was found to be self-efficacy in music, while the predictor of success in learning to play music was motivation to learn music.

The study points to the need to link the psychological and music-educational approach to the problem of acquisition and development of musical competencies and to conduct new research that attempts to explain the nature of the interaction between psychological factors and the acquisition and development of musical competencies of future teachers.

Keywords: musical performance assessment, musical performance, musical knowledge, singing, playing

Introduction

The low confidence of primary education teachers to teach music has been observed in several countries and education systems (Biasutti, Hennessy & da Vugt-Jansen, 2015). This points to the need to explore the complex process of acquiring and developing competencies for music teaching in teacher education and training. Previous research on music education of future primary teachers has focused on the

acquisition of musical and methodological competencies in the existing framework of teacher education (Nikolić, 2017b; Šulentić Begić & Begić, 2014). However, research on the psychological factors of acquiring and developing competencies for teaching music in primary education is still developing. Based on the analysis of discussions on psychological and social aspects that accompany the music education of future primary teachers and teaching practice itself, Nikolić (2018a) concludes that, in addition to music and music pedagogical competencies, teachers should trust their competence, value music and music education, understand the importance of music education for teaching music, cultural-aesthetic and general development of children, and feel comfortable engaging in music and teaching music. Furthermore, they should be motivated to teach music just as they would any other subject in the curriculum.

Research has shown that primary teachers' confidence is lower when teaching music than in other curriculum subjects (Garvis, 2013; Holden & Button, 2006) and although teacher self-efficacy¹ increases with age, self-efficacy in teaching music declines in the first three years of teaching (Garvis, 2013). If teachers have low confidence in their music abilities, they will not deliver appropriate music teaching (Battersby & Cave, 2014) as teachers who are confident in their musical knowledge. Therefore, the cause of the inadequate quality of music teaching in primary education could be teachers' inadequate competence and confidence, i.e., teachers' perceived inadequate self-efficacy in music.

Self-efficacy in music is built through music experience before study program at faculty and in the process of music education in teacher education through direct experiences in successfully solving musical tasks, indirect experiences through observing fellow students and teacher mentors in overcoming musical challenges, high-quality and constructive encouragement from music professors, a positive teaching environment, and by educating students about somatic and emotional states in demonstrating musical activities (Nikolić, *in press*). To date, however, the extent to which perceived self-efficacy in music is related to prospective primary teachers' musical success, which is a prerequisite for high-quality music teaching in schools, has not been empirically studied.

Psychological research has confirmed a link between self-efficacy and motivation (Pervin, Cervone & John, 2008). Self-efficacy is a predictor of motivation to learn because it influences students' learning methods and motivational processes (Zimmerman, 2000). Accordingly, it can be assumed that the higher the student's perception of self-efficacy in music, the greater the motivation to learn music. These are the assumptions for greater success in acquiring musical competencies and skills for teaching music during teacher education. Assumptions about the relationship between self-efficacy and motivation to learn music and musical successfulness have not been empirically investigated.

¹ The term self-efficacy refers to one's assessment of "one's ability to successfully execute various tasks or behaviors" (Petz, 2005, p. 422).

Motivation and self-efficacy of teacher education students for music education

All learning depends on motivation, including music education at teacher studies. The experience of teaching music at the class teacher study program shows that students who want to be excellent and become competent teachers put more effort into mastering musical tasks and practicing musical skills (Nikolić & Šenk, 2018). No theory of motivation can encompass all factors of motivation (West, 2013). Nikolić and Šenk (2018) analyzed the theories of motivation that were used to explore motivation to learn music and identified factors that motivate student teachers to study music. These include perception of one's abilities, effort, sense of achievement in music, positive emotions, and overall benefits of music education.

Individual beliefs about self-efficacy are a significant factor in achievement (Schunk & Pajares, 2002) and can be used to predict people's behavior (Pajares, 2002), effort, and perseverance in dealing with unpleasant experiences and obstacles to achieve desired outcomes. As self-efficacy is context-specific (Woolfolk, 2016), in music education for future primary teachers, it refers to students' beliefs about their self-efficacy in music. Therefore, if a student has a strong sense of self-efficacy in solving musical tasks, they will focus their attention and effort on solving a musical task. On the other hand, a student with perceived low self-efficacy in music will focus their attention on shortcomings and potential difficulties rather than on solving a musical task. Thus, their performance will be somewhat lacking. A student with a higher level of self-efficacy will try harder and be more persistent than a student with lower self-efficacy.

Motivation and self-efficacy determine the extent to which a student engages and achieves their full potential in learning. The purpose of this research is to shed light on the role of self-efficacy and motivation in the process of acquiring and developing musical competencies in students, future primary school teachers.

Acquiring and developing musical competencies

Before the students acquire methodological competencies for teaching music in school, they need to acquire musical competencies. Musical competencies acquired in teacher education in Croatia (Nikolić, 2017b) include the acquisition of knowledge in the field of music (music theory and music culture) and the acquisition and development of musical skills (analytical listening to music, singing, playing). Each of the individual forms of engagement with music differs in terms of the person's skills and engagement.

Singing depends on musical ability,² physiological conditions required for tone production through singing, a person's ability and willingness to integrate perceived

² *Musical ability* in this paper represents human qualities related to "sensory or auditory properties (perception of pitch, volume and timbre, and sense of time), sensitivity to the structure of music (rhythm, key, melody, harmony), musical imagination, musical memory, affective

musical events and imagined musical events with the sensorimotor system required for tone production through singing with fine tuning of expressive musical components. Given that the vocal apparatus is sensitive to a person's emotional state, the ability to control emotions is particularly important. Singing does not require musical education or analysis of musical content, as it can be successful based solely on musical ability.

In playing, understanding musical content through reading notation or listening is crucial, followed by mastering the sensorimotor system that produces the movements required for successful musical performance. Auditory musical potential plays a critical role in this process, though playing a musical instrument at the amateur level does not require high-level musical skill development. The intellectual and motivational role in the development and acquisition of playing an instrument is reflected in organizing the practice. The more planned, continuous, and systematic the practice is, the more successful playing an instrument will be.

The development of analytical music listening requires that students be motivated to focus on the expressive components of the music and to apply their knowledge of music, which requires an intellectual activity that depends on focused attention, self-regulation, and knowledge of music rather than on musical ability.

Acquiring musical knowledge requires the same intellectual ability and will on the part of a person as acquiring knowledge in other areas of learning.

The acquisition and development of musical competencies involve different combinations of human abilities and do not depend exclusively or equally on musical abilities, but also on motivational aspects of learning and willpower, as well as on intellectual and sensorimotor abilities. Empirical studies in Croatia have not yet focused on answering whether musical competencies are acquired holistically and what is the nature of the acquisition of certain musical competencies in students who do not start music education until adulthood.

Methodology

The objective of this study is to determine the relationship between motivation, self-efficacy, and music education among students of teacher education and their success in acquiring and developing musical competencies.

The specific aims of the study are the following:

- 1) to describe students' musical experiences before the college
- 2) to describe psychological factors prior to music education
 - a. motivation for music education

response to music, and aesthetic sensitivity to music (sensitivity to artistic quality and evaluation of a musical work)" (Nikolić, 2018b, p. 314).

- b. self-efficacy in music education
- 3) to describe musical competencies after music education
 - a. singing
 - b. playing an instrument
 - c. musical knowledge
- 4) to identify the relationships between individual musical competencies
- 5) to identify the relationship between psychological factor scores and individual musical competencies.

Following the set goal of this longitudinal research, the following hypotheses were formulated:

H1: There is a statistically significant correlation between the acquisition of individual musical competencies.

H2: There is a statistically significant correlation between motivation, self-efficacy, and music education.

H3: There is a statistically significant correlation between motivation to learn music and success in acquiring and developing specific musical competencies.

H4: There is a statistically significant correlation between self-efficacy in music education and success in acquiring and developing specific musical competencies.

Respondents

This study included 105 second-year female students of the Faculty of Education in Osijek. The average age of the students was 19.83 years (SD=0.81; Min.=19; Max.=23).

Instruments

The initial research was conducted via a two-part survey. The first part of the survey collected the data on the demographic characteristics of respondents (age, gender) and the experience of playing music and music education before enrolling university teacher education program.

The second part of the survey was a *Questionnaire on motivation and self-efficacy for music education in students of teacher education* that consisted of 19 statements. For each of the statements, respondents assessed the extent to which they agreed on a five-point Likert scale (from 1=strongly disagree to 5=strongly agree). To ensure honesty, respondents coded the questionnaires with unique date and place of birth encryption. Thus, we could later pair all parts of the survey. The reliability of the whole scale is satisfactory (Cronbach's alpha coefficient (α)=0.899).

Before conducting the statistical analysis, we evaluated the factor structure of the scale *Questionnaire on motivation and self-efficacy for music education in students of teacher education*. The adequacy of the data was evaluated to conduct a factor analysis

of the principal components. The examination of the correlation matrix revealed numerous values of 0.3 and higher. The Kaiser-Mayer-Olkin measure (KMO=0.854) and Bartlett's Test of Sphericity ($\chi^2=925.212$; $df=171$; $p<0.000$) were performed and the results showed that the data were adequate for factor analysis.

Exploratory factor analysis used the Kaiser-Guttman extraction criterion, retaining four factors with an eigenvalue greater than 1, explaining 5.34% to 36.74% of the variance. Due to the excessive number of factors in relation to the number of items, Horn's parallel analysis was performed using the *Monte Carlo PCA* statistical program for parallel analysis. The parallel analysis showed that the values of the two components obtained by the matrix of numbers (19 variables x 105 respondents) exceeded the corresponding thresholds and indicated the retention of the two components. In this way, two factors were identified that together explain 48.23% of the variance. There is a weak positive correlation between these two factors ($r=0.357$; $p<0.05$). The results of the factor analysis according to the Oblimin rotation showed that the questionnaire consists of two subscales: (1) *the self-efficacy subscale for music education* (12 items) and (2) *the subscale of motivation for music education* (7 items) (Table 1). The reliability of each of the subscales is satisfactory, the Cronbach's alpha coefficient (α) for the self-efficacy subscale for music education is 0.887, and for the subscale of motivation for music education 0.794.

Table 1 Pattern and structure matrix for PCA with Oblimin rotation of two-factor solution for *Questionnaire on motivation and self-efficacy for music education in students of teacher education items*

	Item	Pattern Coefficients Component		Structure Coefficients Component		Communalities
		1	2	1	2	
Factor 1: Self-efficacy for music education	1	0.701	-0.051	0.682	0.199	0.468
	2	0.725	0.052	0.744	0.311	0.556
	3	0.719	-0.114	0.678	0.142	0.471
	4	0.545	0.003	0.546	0.198	0.298
	5	0.528	-0.219	0.449	-0.031	0.244
	13	0.477	0.440	0.634	0.610	0.571
	14	0.577	0.154	0.632	0.361	0.420
	15	0.517	0.115	0.558	0.299	0.322
	16	0.694	0.147	0.747	0.395	0.577
	17	0.528	0.451	0.690	0.640	0.653
	18	0.731	0.162	0.789	0.424	0.645
19	0.707	0.105	0.744	0.357	0.653	
Factor 2: Motivation for music education	6	0.019	0.552	0.216	0.559	0.313
	7	-0.148	0.899	0.401	0.846	0.734
	8	-0.160	0.756	0.110	0.699	0.510
	9	0.200	0.648	0.431	0.719	0.552
	10	0.223	0.498	0.401	0.578	0.377
	11	0.144	0.475	0.314	0.527	0.296
	12	0.052	0.752	0.319	0.769	0.594
Eigenvalues		6.981	2.183			
% of variance		36.742	11.487			

In order to achieve an objective assessment of performance in the acquisition of musical competencies, *The Music Literacy Test* was administered. The test included 29 tasks of the application of music theory knowledge (identifying and familiarity with pitch notes in the treble clef, identifying the duration of notes and rest, identifying scales by key signatures, understanding the measure characteristics, major and minor quint chord, music symbols and terminology). The maximum score in this test was 29. *The Music Literacy Test* showed good internal consistency (Cronbach's alpha (α)=0.782), so the results could be used for further analysis. The *Test* was not anonymous, which motivated students to present their best knowledge.

Each participant was recorded singing and playing three songs. The audio recordings of their performance were evaluated by three independent experts, who assigned scores from 1 (inadequate) to 5 (excellent) for each of the evaluation items. The mean of all scores was calculated. The evaluation of singing included the following items: intonation, rhythm precision, consistency of the beat, pronunciation quality and phrasing. The scale evaluating singing showed good internal consistency (Cronbach's alpha (α)=0.859). The evaluation of playing included accuracy of tones, rhythm precision, consistency of the beat, and expressiveness (legato, phrasing, tempo). The playing evaluation scale showed good internal consistency (Cronbach's alpha (α)=0.739).

Since the skewness and kurtosis parameters were outside of the -2 to +2 range for the majority (Table 2), Bloom's formula was used to conduct the normalization of variable distribution. Thus, the data were suitable for parametric procedures.

Table 2 Descriptive characteristics of the observed measures

Measure	M	SD	Range	Skewness	Kurtosis	Kolmogorov Smirnov Sig.
Self-efficacy for music education	34.41	8.47	14-55	0.172	-0.016	0.200
Motivation for music education	30.36	4.23	12-35	-1.300	2.529	0.000
Singing	4.12	0.66	1-5	-1.491	4.232	0.030
Playing	3.93	0.89	1-5	-0.956	0.316	0.001
Musical knowledge	21.97	6.20	0-29	-1.755	3.468	0.000

Procedure

The research was conducted during one academic year. At the beginning of the academic year, students were introduced to the objective of the research and how it would be conducted. Students who volunteered to participate in the research completed a survey and questionnaire.

The students attended vocal-instrumental classes during their second year at the class teacher study programe. Classes were held one hour per week for two semesters in groups of 12 students. This included beginner lessons of singing and playing children's songs on the piano and music theory to the extent necessary to understand the song notation. Each musical exercise was presented during a lesson, explained, and demonstrated by the professor. Students were taught how to practice and learn a particular task. In the next lesson, each student demonstrated the task by singing and playing, followed by the professor's suggestions for individual progress and improvement.

On three occasions during the academic year, students were recorded singing and playing the piano via an audio device. Each time, a student first played the song on the piano and then sang it *a capella*. *The Music Literacy Test* was administered during the last lesson. Their professor graded the *Test*, while three independent experts evaluated the singing and playing based on the students' recordings.

The data obtained were subjected to quantitative analysis using the statistical program SPSS, version 19.0.

Results and interpretation

Students' musical experience before college

Students described their musical experience before class teacher study program. It was found that 31.43% (N=33) of the respondents had experience with some form of music in ensembles and/or music education outside of the formal education system, while 68.57% (N=72) had no experience with making music or music education outside the formal education system. These findings are consistent with previous research findings (Nikolić, 2018b, 2020; Nikolić & Ercegovac-Jagnjić, 2020) that emphasize the lack of active music making and musical skills as well as very poor knowledge of music because of inadequate music classes in the general education system, poor attendance of extracurricular music activities, or forms of formal and informal music learning of students enrolled in university teacher education programs.

Motivation and self-efficacy for music education before music classes

Students reported higher than average motivation to learn music (M=4.34) (Table 3). Given the above-average result and the distribution of responses, according to which 64.76% to 94.28% of students partially or strongly agreed with the statements, it can be concluded that students have satisfactory motivation for music education. A statistically significant difference was calculated with the paired-samples t-test ($t(104)=-5.950$; $p=0.000$) between the results for the statement that they have always wanted to have music education (M=3.75; item 9) (Table 3) and the statement that they want to learn to play and sing because teachers need this skill (M=4.51; item 11). It shows that their motivation is more guided by acquiring the necessary competencies for teacher profession rather than by their intrinsic motivation to learn music.

Table 3 Motivation for music education before music classes

	N	M	SD	% 1	% 2	% 3	% 4	% 5
8. I want to learn to teach Music Culture.	105	4.66	0.66	0	0.95	7.62	16.19	75.24
7. I want to learn to play.	105	4.62	0.63	0	0.95	4.76	25.71	68.57
11. I don't want to learn to play and sing because I don't think it is necessary for teachers. *	104	4.51	0.92	0.96	1.93	8.65	17.31	71.15
6. I want to learn to sing well.	105	4.46	0.73	0	1.90	8.57	31.43	58.10
10. I don't want music education because I lack the necessary musical skills. *	105	4.18	1.10	2.86	7.62	12.38	22.86	54.29
12. I am looking forward to learning how to play an instrument.	105	4.18	0.95	0.95	4.76	17.14	29.52	47.62
9. I want music education; I've always wanted it.	105	3.75	1.18	7.62	5.71	21.90	33.33	31.43
Total	105	4.34	0.61	* The scale is reversed in these items.				

The neutral result of students' self-efficacy in music education ($M=2.87$) (Table 4) shows that students do not have enough musical experience to develop self-efficacy in music, but also believe that they cannot master the music tasks. Since there is no statistically significant difference between expectations of success in music at college ($M=3.11$; item 17) (Table 4) and self-efficacy in acquiring music skills so far ($M=3.05$; item 18) ($t(104)=0.717$; $p=0.475$; paired-samples t-test), nor between expectations of success in music ($M=3.11$; item 17) and perceptions of self-efficacy in acquiring musical competencies ($M=3.11$; item 19) ($t(1045)=0.000$; $p=1.000$), it is clear that students did not develop self-efficacy in music due to their prior music education and lack of experience with music tasks.

Table 4 Self-efficacy for music education before music classes

	N	M	SD	% 1	% 2	% 3	% 4	% 5
13. I am happy I will practice singing.	105	3.93	1.09	2.86	7.62	21.90	28.57	39.05
4. I memorize the tune quickly.	105	3.90	0.87	0.95	3.81	25.71	42.86	26.67
3. I can repeat the rhythm I hear.	105	3.66	1.07	4.76	10.48	20.00	43.81	20.95
17. I believe that I will successfully master the music tasks in college.	105	3.11	0.97	3.81	19.05	44.76	26.67	5.71
19. I successfully acquire musical knowledge.	105	3.11	0.97	7.62	13.33	44.76	28.57	5.71
18. So far, I have successfully developed skills in listening to music, singing, and playing an instrument.	105	3.05	1.20	12.38	19.05	32.38	23.81	12.38
2. I successfully sing the tone that I hear.	105	2.92	1.28	22.86	5.71	38.10	22.86	10.48
5. I hear individual tones in a chord.	105	2.33	1.00	31.43	10.48	51.43	6.67	0
16. I trust my singing abilities.	105	2.21	1.09	32.38	30.48	22.86	12.38	1.90
1. My singing abilities are average.	105	2.12	1.01	38.10	17.14	40.00	3.81	0.95
14. I feel discomfort when I think about vocal-instrumental classes.*	105	2.10	1.13	33.33	42.86	11.43	5.71	6.67
15. I'm afraid I will fail fulfilling the requirements of vocal-instrumental classes.*	105	1.95	0.99	36.19	44.76	9.53	6.67	2.86
Total	105	2.87	0.71	* The scale is reversed in these items.				

The expected correlation between self-efficacy ($M=4.34$; Table 3) and motivation ($M=2.87$; Table 4) was also confirmed in this study, as the Pearson correlation coefficient $r=0.567$ ($p=0.000$) and the correlation is significant and positive. Thus, students who have higher levels of self-efficacy for learning music also have higher motivation to learn music.

Musical competencies after music classes

Students presented their achievements in music classes by playing three songs. The average score of all students ($M=3.93$; $SD=0.89$; $Min=1$; $Max=5$) shows that students acquired the skill of playing music. This score is one point higher than the average score. Students played the songs very well with two hands, playing the melody with the right hand and the harmonic accompaniment that reflects the measure with the left hand. Rhythm accuracy ($M=4.40$; $SD=0.74$) and tone accuracy ($M=4.25$; $SD=0.83$) received the highest scores, while consistency of the beat ($M=3.66$; $SD=1.09$) and expressiveness ($M=3.41$; $SD=1.07$) scored lower, which is consistent with beginners learning to play music.

A cappella singing also scored one point above average ($M=4.12$; $SD=0.66$; $Min=1$; $Max=5$). The highest scoring vocal elements were rhythm accuracy ($M=4.82$; $SD=0.51$) and consistency of the beat ($M=4.66$; $SD=0.53$), while pronunciation quality ($M=4.43$; $SD=0.58$) was rated one point lower than average, and expressiveness ($M=3.45$; $SD=0.93$) and intonation accuracy ($M=3.21$; $SD=1.41$) received the lowest score. These results indicate poor intonation, which is consistent with the heterogeneity of the students in terms of musical ability. There is no entrance exam with a test of musical abilities, so there is no selection regarding musical potential before students enroll the Faculty of Education. The results of success in singing are consistent with the status of the musical ability of student teachers, which was determined by *The Test of Musical Abilities* (Nikolić, 2017a) in previous research (Nikolić, 2018b).

The *Music Literacy Test* showed that the average score ($M=21.97$; $SD=6.20$; $Min.=0$; $Max.=29$) covers 75,76% of the test, while task solvability ranged from 64.80% to 88.25%. Students were able to apply elementary music literacy after the vocal-instrumental classes. They were most successful in identifying major scale according to key signatures and identifying notes in treble clef, while least successful in identifying the note and rest duration, as well as musical symbols and terminology.

Since the musical competencies of playing, singing, and musical knowledge differ in how they are acquired, we examined whether the acquisition of these competencies is related. Pearson's linear correlation coefficient showed that there is a significant positive correlation between playing and singing ($r=0.536$; $N=105$; $p=0.000$). The relationship between the acquisition of musical knowledge and playing skills ($r=0.532$; $N=105$; $p=0.000$) is positive and significant, while the relationship between musical knowledge and singing abilities ($r=0.363$, $N=105$; $p=0.000$) is positive but low.³

The relationship between musical performance with motivation and self-efficacy for learning music before music education

The correlation of predictor psychological variables with musical competencies was examined in two ways.

³ The correlation strength is adopted from Petz, Kolesarić and Ivanec (2012: p. 313).

The correlation between these phenomena was first examined to determine the extent to which individual psychological variables are related to a particular musical competence. The obtained Pearson's correlations between predictor psychological variables and individual musical competencies showed that there is no relationship between psychological variables and the acquisition of musical knowledge (Table 5). The positive correlation between motivation, singing, and playing and self-efficacy and playing has been established. An actual significant positive correlation was established only between self-efficacy and singing.

Table 5 Pearson's correlation coefficient between motivation and self-efficacy for music education and individual musical competencies

		Singing	Playing	Musical Knowledge
Motivation	r	0.371**	0.281**	0.166
	p	0.000	0.004	0.090
Self-efficacy	r	0.567**	0.229*	0.171
	p	0.000	0.019	0.081

** Correlation is significant at 0.01.

*Correlation is significant at 0.05.

To account for the unique contribution of individual psychological variables measured prior to music classes (motivation, self-efficacy) to the development of musical competencies, regression analyzes were conducted. Each of the three types of musical competencies was a criterion variable. A set of psychological variables (self-efficacy, motivation) successfully predicted success in singing, and a significant regression function was found ($r=0.573$; $r^2=0.329$; $p=0.000$) predicting 33% of the criterion variable of singing. However, the only predictor of singing success is self-efficacy (Table 6).

Table 6 Predictors of singing and playing

Predictor	Singing			Playing		
	β	t	p	β	t	p
Self-efficacy	0.485	4.921	0.000**	0.087	0.763	0.447
Motivation	0.137	1.387	0.168	0.240	2.092	0.039*

**Statistical significance at 0.01.

* Statistical significance at 0.05.

The same set of psychological variables successfully predicts performance in playing, and a significant regression function was obtained ($r=0.298$; $r^2=0.089$; $p=0.009$), which predicts 9% of the variable of playing. Only motivation makes a unique contribution to the prediction of playing success (Table 6). The set of psychological variables

does not predict success in the acquisition of musical knowledge ($r=0.194$; $r^2=0.038$; $p=0.142$).

Discussion

The research revealed that the three musical competencies examined are inter-related and the acquisition of one competency promotes the development of the others, which argues for holistic development of musical competencies. The instructional model implemented indicates an integrated model of learning musical skills and knowledge. From the results, it can be concluded that sensorimotor and musical abilities are shared in singing and playing, which is not the case between learning to sing and acquiring musical knowledge, so the low correlation between these competencies is justified. The significant and positive correlation between playing and musical knowledge can be explained by the intellectual role of analysis and understanding of musical content in the acquisition of these two competencies. The first hypothesis, that there is a statistically significant correlation in the acquisition of the observed musical competencies, has been confirmed.

The observed motivation to learn music in students showed a satisfactory level, but not high. Also, the motivation to learn music was not intrinsic. The result of students' self-efficacy in music education showed that students did not develop self-efficacy in music, which is to be expected given the low level of musical experience before class teacher study program. A statistically significant positive correlation confirmed the second hypothesis, i.e., that motivation and self-efficacy in music education are related. It can be assumed that by acting on increasing self-efficacy in music, one could also act on increasing motivation to learn music.

The results of this study showed positive but low correlations between motivation and singing and playing, which means that students with a higher level of motivation to learn music before vocal-instrumental classes are more successful in playing and singing. The importance of the psychological constructs of motivation and self-efficacy is reflected in the fact that these psychological variables predict 33% of the variance of success in singing and 9% of the variance of success in playing. The finding that motivation before music education predicts success in learning to play may indicate a willingness and intellectual influence on practice that is necessary for success in learning to play. Since the relationship between motivation and musical knowledge has not been established, and students have shown that their motivation to learn music stems from a desire to become competent teachers, it can be assumed that students perceive teachers' musical competencies through musical skills rather than musical knowledge. The third hypothesis, i.e., there is a statistically significant relationship between motivation to learn music and the acquisition and development of certain musical competencies was partially confirmed. This study showed that student/teacher motivation to learn music is a predictor of playing, but not of singing or musical knowledge. Since musical abilities are not critical to playing permanently tuned instrument (such as keyboards), it is the motivation that drives the student to

practice this skill. The sense of accomplishment should increase the student's self-efficacy in music and could, in turn, increase motivation to learn music.

The fourth hypothesis was also partially confirmed because a significant statistical correlation was found between self-efficacy and singing, while the correlation between self-efficacy and playing was low, and not significant for music knowledge. When we consider the negligible number of students who have had some form of formal music education before learning an instrument (Nikolić, 2018b, 2020), it becomes clear that students base their self-efficacy mainly on singing experience, which highlights the importance of direct experience in building self-efficacy in music. Since self-efficacy in music has been found to predict success in singing, it can be assumed that by gaining direct experience in learning from others, new musical competencies will increase their self-efficacy in music, which could contribute to higher levels of self-efficacy in teaching music in school.

Because self-efficacy in music depends on experiences of success in music tasks, students do not have built-in self-efficacy in music before classes because they have not had any musical experiences before study programs at faculty. As in previous research (Nikolić, 2018b, 2020; Nikolić & Ercegovac-Jagnjić, 2020), the only experience some students have is singing, so the research shows that self-efficacy in music is a predictor of success in singing. Practicing singing, experiencing success, and having praise from professors and pleasant emotions should increase self-efficacy, which in turn increases motivation to learn to sing. Since research has shown that musical competencies are acquired holistically, success in learning to sing and building self-efficacy should promote the acquisition of other musical competencies, which is indicated by the correlation found between self-efficacy and success in learning to play.

It is crucial to have quality music education in study programs at faculty with enough music classes for students to have enough positive musical experience. This way music education at faculty could help students, future teachers to succeed in music, which would lead to confidence in teaching Music as a subject. Leshkova Zelenkovska and Islam (2017) confirmed in their research that acquired musical skills are the most important predictors of the confidence of primary school teachers in teaching music. Therefore, the authors concluded that the respondents justified the need for more extensive music education at faculty and practice in schools to provide adequate, continuous, and ongoing music education. Similar suggestions by students and music professors were recorded by Nikolić (2017b) in her research on teacher education in Croatia.

Conclusion

Weak confidence to teach music is a universal problem, most often attributed to primary education teachers' lack of musical competencies. However, the causes are in the complex process of music education that begins in adolescence, in primary teacher education programs, and in the psychological factors that accompany learning.

Determining the initial status of the psychological constructs of motivation to learn music and self-efficacy in music and assessing the musical competencies achieved after one year of music education provided insight into the complex process of acquiring competencies for teaching music in primary education. The psychological constructs of motivation and self-efficacy are associated with the success of acquiring musical competencies in singing and playing, but not with the acquisition of musical knowledge. Moreover, self-efficacy and motivation predict success in singing and playing. It was found that self-efficacy in music is the psychological predictor of success in singing, while motivation is the predictor of success in learning to play an instrument. Since research has shown that musical competencies are acquired holistically, it is assumed that knowledge is transferred from one competency to another during the process of developing musical competencies. Success in the development and acquisition of musical competencies may increase perceptions of self-efficacy, which in turn may increase motivation, which in turn may contribute to the further process of musical competency development. The mentioned interaction could lead to greater musical competence and self-efficacy for future music teachers, which is necessary for better teaching Music as a subject in primary school.

The results of this study indicate the need to link the psychological and music-pedagogical education approach to the problem of musical competencies acquisition and development, and to conduct new research that attempts to explain the nature of the interaction between psychological factors and the acquisition and development of musical competencies of future teachers.

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