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THE IMPACT OF MUSIC LEARNING ENGAGEMENT ON STUDENTS' SOCIAL SKILLS

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ABSTRACT

This study aimed to explore the impact of music learning engagement on middle school students' social skills and analyze the role of demographic factors. Using a quantitative approach, a questionnaire survey was conducted among 600 students randomly selected from Liaoning Provincial Experimental Middle School, Yan'an Middle School, and Hohhot No. 2 Middle School (200 students per school). Descriptive statistics, independent samples t-test, one-way ANOVA, and multiple linear regression analysis were used for data processing. The results confirmed two hypotheses: Demographic factors (gender, age, music education duration, parents' monthly income) significantly affected social skills (females, older students, those with longer music learning experience, and students from high-income families had better social skills); music

learning engagement (time, effort, emotional investment) positively impacted social skills, with emotional engagement having the strongest effect ($\beta=0.522$), followed by effort engagement ($\beta=0.400$) and time engagement ($\beta=0.210$). The three factors together explained 99.5% of the variance in social skills. This study provides empirical support for optimizing music education and promoting students' comprehensive development.



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INTRODUCTION

Against the backdrop of 21st-century quality-oriented education reform, China has increasingly emphasized the cultivation of non-intellectual factors such as social skills. As a core component of aesthetic education, music education, with its characteristics of emotional expression and interpersonal interaction, plays a pivotal role in enhancing students' social skills (Váradi, 2022). Existing studies have confirmed that music learning can improve communication, collaboration, and self-confidence (Jian, 2022). However, few have systematically analyzed the multi-dimensional impact of music learning engagement (time, effort, emotion) on social skills or the regulatory role of demographic factors.

Based on Engagement Theory (Fredricks et al., 2004), Social Intelligence Theory (Goleman), and Ecological Systems Theory (Bronfenbrenner), this study focuses on two core research questions: How do demographic factors affect students' social skills? How does music learning engagement impact students' social skills? The research aims to clarify the mechanisms underlying these factors, provide practical evidence for music education reform, and contribute to the comprehensive development of middle school students.

Research Questions

The research questions are as follows:

How do demographic factors impact students' social skills?

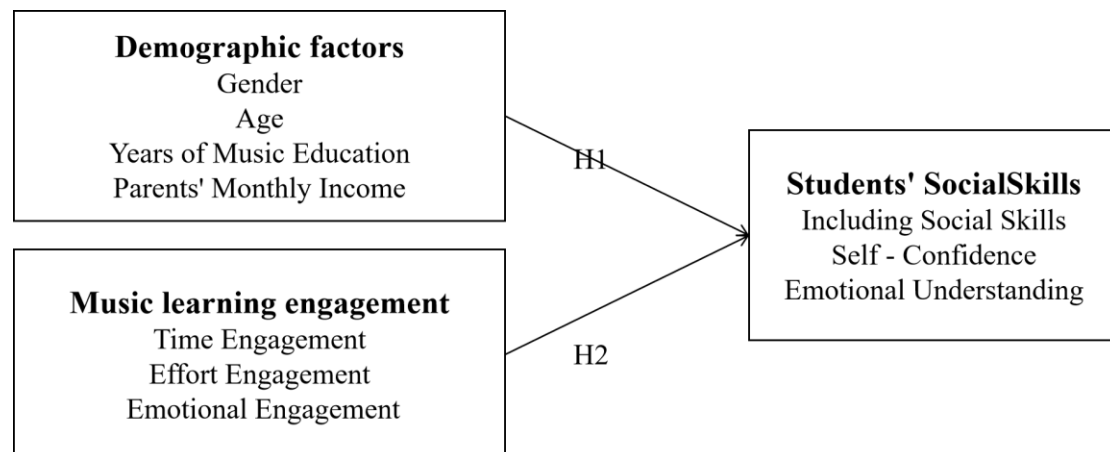
How does music learning engagement impact students' social skills?

Research Objectives

To Analyze the Impact of Demographic Factors on Students' Social Skills: This objective aims to investigate how demographic factors, such as age, gender, socio-economic status, and cultural background, affect the development of students' social skills. By understanding these impacts, the research seeks to identify disparities or trends across different demographic groups.

To Examine the Role of Music Learning Engagement in Enhancing Students' Social Skills: This objective aims to investigate the extent to which students' engagement in music learning activities impacts their social skills. The study will delve into how active participation in music-related projects, performances, and group activities contributes to the development of interpersonal relationships, collaboration, and social interaction skills among students.

Research Framework



RESEARCH METHODS

This study adopted a quantitative research approach with a cross-sectional survey design. The population included all middle school students from three representative schools (Liaoning Provincial Experimental Middle School, Yan'an Middle School, and Hohhot No.2 Middle School), representing diverse geographical, cultural, and educational backgrounds. A total of 600 students (200 from each school) were selected via simple random sampling (random number generator), ensuring representation across genders, ages, and family backgrounds.

Table 1 Number of Samples in Each Job Level

School Name	Sampling Quantity
Liaoning Provincial Experimental Middle School	200
Yan'an Middle School	200
Hohhot No.2 Middle School	200

Research variables included: (1) Explanatory variables: Demographic factors (gender, age: 12-15 years old, music education duration, parents' monthly income) and music learning engagement (three dimensions: time engagement, effort engagement, emotional engagement); (2) Explained variable: Students' social skills (three dimensions: social skills, self-confidence, emotional understanding). A self-designed structured questionnaire was the main research tool, consisting of three parts



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(demographic information, music learning engagement, social skills) with a 5-point Likert scale (1=completely disagree, 5=completely agree).

The questionnaire's content validity was verified by three experts using the Item-Objective Congruence (IOC) index (all items had $IOC \geq 0.5$). Reliability was assessed via a pre-survey of 30 samples, with Cronbach's $\alpha \geq 0.7$, indicating good internal consistency. Data were collected anonymously through the Questionnaire Star platform from March to June 2025. Data analysis techniques included descriptive statistics (frequency, mean, standard deviation) and inferential statistics (independent-samples t-test, one-way ANOVA, multiple linear regression) using statistical software.

RESULTS AND DISCUSSION

Results

Descriptive statistics were used to summarize the sample's basic characteristics and the distributions of the core variables, providing an overview of the data. This section presents the results for demographic factors, music learning engagement, and students' social skills, analyzed using absolute frequency, percentage frequency, arithmetic mean, standard deviation, and interpretation based on Likert scale criteria.

Table 2 summarizes the demographic characteristics of the 600 participants.

Table 2 The Frequency and Percent Frequency Classified by Demographic Factor

1. Gender	Frequency	Percentage
Male	324	54.0
Female	276	46.0
Total	600	100.0

2. Age	Frequency	Percentage
12 years old	169	28.2
13 years old	72	12.0
14 years old	180	30.0
15 years old	179	29.8
Total	600	100.0

3. Music Education	Frequency	Percentage
None	17	2.8
Less than 1 year	34	5.7
1 - 2 years	52	8.7
3 - 4 years	194	32.3
More than 4 years	303	50.5



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Total	600	100.0
4. Parents' Monthly Income	Frequency	Percentage
Not more than CNY 5,000	132	22.0
CNY 5,001 - CNY 7,000	315	52.5
CNY 7,001 - CNY 10,000	18	3.0
CNY 10,001 - CNY 15,000	42	7.0
Above CNY 15,000	93	15.5
Total	600	100.0

Music Students' Social Skills

Table 3 The Descriptive Statistics of Music Students' Social Skills

	N	Mean	Std. Deviation	Rank	Meaning
Time Engagement	600	3.698	0.883	1	Agree
Effort Engagement	600	3.855	0.920	2	Agree
Emotional Engagement	600	3.858	0.942	1	Agree
Music Students' Social Skills	600	3.804	0.774		

Students' Social Skills

Table 4 The Descriptive Statistics of Students' Social Skills

	N	Mean	Std. Deviation	Rank	Meaning
Social Skills	600	3.708	0.733	1	Agree
Self-Confidence	600	3.877	0.918	3	Agree
Emotional Understanding	600	3.838	1.015	2	Agree
Students' Social Skills	600	3.808	0.813		

Descriptive Statistics of Core Variables

Music learning engagement: The overall mean was 3.804 (SD=0.774), with emotional engagement (3.858) > effort engagement (3.855) > time engagement (3.698), all at the "agree" level.

Students' social skills: The overall mean was 3.808 (SD=0.813), with self-confidence (3.877) > emotional understanding (3.838) > social skills (3.708), all at the "agree" level.



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Hypothesis Testing Results
Differences in Demographic Factors Generate Differences in Students' Social Skills

Table 5 Differences in Gender Generate Differences in Students' Social Skills

$H_0: \mu_1 = \mu_2$

$H_a: \mu_1 \neq \mu_2$

Items	Gender	N	Mean	S.D.	t-value	p-value
Students' Social Skills	Male	324	3.422	0.747	20.936	0.000
	Female	276	4.260	0.637		

Differences in Age Generate Differences in Students' Social Skills

$H_0: \mu_i = \mu_j$

$H_a: \mu_i \neq \mu_j$ at least one Pair where $i \neq j$.

Table 6 The One-way ANOVA of Age

Students' Social Skills		Sum of Squares	Df	Mean Square	F	Sig.
Age	Between Groups	65.053	3	21.684	39.006	0.000
	Within Groups	331.325	596	0.556		
	Total	396.378	599			

Table 7 Multiple Comparisons of Age

(I) Age	(J) Age	Mean	S.D.	p.	Confidence Interval	
12 years old	12 years old	-.2121 1*	0.105	0.044	-0.385	-0.039
	13 years old	-.8298 9*	0.080	0.000	-0.961	-0.698
	14 years old	-.2575 6*	0.080	0.001	-0.389	-0.126
13 years old	12 years old	.21211 *	0.105	0.044	0.039	0.385
	14 years old	-.6177 8*	0.104	0.000	-0.789	-0.446



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(I) Age	(J) Age	Mean	S.D.	p.	Confidence Interval	
	15 years old	-.04545	0.104	0.662	-0.217	0.126
	12 years old	.82989*	0.080	0.000	0.698	0.961
14 years old	13 years old	.61778*	0.104	0.000	0.446	0.789
	15 years old	.57233*	0.079	0.000	0.443	0.702
	13 years old	.25756*	0.080	0.001	0.126	0.389
15 years old	14 years old	0.04545	0.104	0.662	-0.126	0.217
	15 years old	-.57233*	0.079	0.000	-0.702	-0.443

Differences in Music Education Generate Differences in Students' Social Skills

H₀: $\mu_1 = \mu_2$

H_a: $\mu_1 \neq \mu_2$

Table 8 The Independent Samples t-test of the Music Education Factor

Students' Social Skills		Sum of Squares	Df	Mean Square	F	Sig.
Music Education Factor	Between Groups	48.535	4	12.134	20.755	0.000
	Within Groups	347.843	595	0.585		
	Total	396.378	599			

Table 9 Multiple Comparisons of Music Education

(I) Music Education	(J) Music Education	Mean	S.D.	p.	Confidence Interval	
None	Sophomore	-.49910*	0.079	0.000	-0.630	-0.368
	Less than 1 year	-.35000*	0.192	0.069	-0.666	-0.034
	1 - 2 years	-.63571*	0.135	0.000	-0.859	-0.413



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(I) Music Education	(J) Music Education	Mean	S.D.	p.	Confidence Interval	
	3 - 4 years	-.90735*	0.104	0.000	-1.078	-0.737
Less than 1 year	None	.49910*	0.079	0.000	0.368	0.630
	1 - 2 years	0.14910	0.185	0.421	-0.156	0.454
	3 - 4 years	-0.13661	0.126	0.277	-0.344	0.070
	More than 4 years	-.40825*	0.090	0.000	-0.557	-0.260
1 - 2 years	None	.35000*	0.192	0.069	0.034	0.666
	Less than 1 year	-0.14910	0.185	0.421	-0.454	0.156
	3 - 4 years	-0.28571	0.215	0.185	-0.641	0.069
	More than 4 years	-.55735*	0.197	0.005	-0.882	-0.233
3 - 4 years	None	.63571*	0.135	0.000	0.413	0.859
	Less than 1 year	0.13661	0.126	0.277	-0.070	0.344
	1 - 2 years	0.28571	0.215	0.185	-0.069	0.641
	More than 4 years	-.27163*	0.142	0.056	-0.506	-0.037
More than 4 years	None	.90735*	0.104	0.000	0.737	1.078
	Less than 1 year	.40825*	0.090	0.000	0.260	0.557
	1 - 2 years	.55735*	0.197	0.005	0.233	0.882
	3 - 4 years	.27163*	0.142	0.056	0.037	0.506

Differences in Parents' Monthly Income Generate Differences in Students' Social Skills

$$H_0: \mu_i = \mu_j$$

$H_a: \mu_i \neq \mu_j$ at least one Pair where $i \neq j$.

Table 10 The One-way ANOVA of Parents' Monthly Income

Students' Social Skills		Sum of Squares	Df	Mean Square	F	Sig.
Parents' Monthly Income	Between Groups	91.812	4	22.953	44.841	0.000
	Within Groups	304.566	595	0.512		
	Total	396.378	599			

Table 11 Multiple Comparisons of Parents' Monthly Income



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(I) Parents' Monthly Income	(J) Parents' Monthly Income	Mean	S.D.	p.	Confidence Interval	
Not more than CNY 5,000	CNY 5,001 - CNY 7,000	-0.0745	0.213	0.726	-0.425	0.276
	CNY 7,001 - CNY 10,000	-.6110*	0.200	0.002	-0.940	-0.282
	CNY 10,001 - CNY 15,000	-.6788*	0.181	0.000	-0.977	-0.381
	Above CNY 15,000	-1.268*	0.178	0.000	-1.563	-0.975
CNY 5,001 - CNY 7,000	Not more than CNY 5,000	0.074	0.213	0.726	-0.276	0.425
	CNY 7,001 - CNY 10,000	-.536*	0.158	0.001	-0.797	-0.277
	CNY 10,001 - CNY 15,000	-.604*	0.133	0.000	-0.824	-0.385
	Above CNY 15,000	-1.194*	0.129	0.000	-1.408	-0.981
CNY 7,001 - CNY 10,000	Not more than CNY 5,000	.611*	0.200	0.002	0.282	0.940
	CNY 5,001 - CNY 7,000	.536*	0.158	0.001	0.277	0.797
	CNY 10,001 - CNY 15,000	-0.067	0.112	0.544	-0.252	0.116
	Above CNY 15,000	-.657*	0.107	0.000	-0.835	-0.481
CNY 10,001 - CNY 15,000	Not more than CNY 5,000	.678*	0.181	0.000	0.381	0.977
	CNY 5,001 - CNY 7,000	.604*	0.133	0.000	0.385	0.824
	CNY 7,001 - CNY 10,000	0.067	0.112	0.544	-0.116	0.252
	Above CNY 15,000	-.590*	0.066	0.000	-0.698	-0.482
Above CNY 15,000	Not more than CNY 5,000	1.268*	0.178	0.000	0.975	1.563
	CNY 5,001 - CNY 7,000	1.194*	0.129	0.000	0.981	1.408
	CNY 7,001 - CNY 10,000	.657*	0.107	0.000	0.481	0.835
	CNY 10,001 - CNY 15,000	.590*	0.066	0.000	0.482	0.698



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Music Learning Engagement impact on Students' Social Skills

$$H_0: \beta_i = 0$$

$$H_a: \beta_i \neq 0 \ (i=1, 2, 3)$$

The Multiple Linear Regression Analysis is applied in this study.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

Where Y = Students' Social Skills

X₁ = Time Engagement

X₂ = Effort Engagement

X₃ = Emotional Engagement

Table 12 The Multiple Linear Regression Analysis of Music Students' Social Skills Impact on Students' Social Skills

		Coefficient		t	p-value	
Model		Unstandardized Coefficients	Standardized Coefficients Beta			
		B	Std.Error			
1	Constant	-0.011	0.018	-0.620	0.536	
	X1 = Time Engagement	0.194	0.005	0.210	42.679	0.000
	X2 = Effort Engagement	0.353	0.006	0.400	56.643	0.000
	X3 = Emotional Engagement	0.451	0.007	0.522	69.106	0.000
Dependent Variable: Students' Social Skills						

$$Y = 0.011 + 0.194X_1 + 0.353X_2 + 0.451X_3$$

$$(0.536) \quad (0.000) \quad (0.000) \quad (0.000)$$

$$\text{Adjusted } R^2 = 0.995$$

Table 13 The Summary Results of Hypothesis Testing



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	Not Reject H ₀	Reject H ₀
Hypothesis 1		
1. Gender		0.000***
2. Age		0.000***
3. Music Education		0.000***
4. Parents' Monthly Income		0.000***
Hypothesis 2		
Time Engagement		0.000***
Effort Engagement		0.000***
Emotional Engagement		0.000***

Impact of demographic factors: All demographic variables had significant effects on social skills ($p=0.000<0.05$):

Gender: Females (mean=4.260) scored significantly higher than males (mean=3.422);

Age: Social skills improved with age, with 14-15-year-olds significantly higher than 12-13-year-olds;

Music education duration: Students with >4 years of experience scored highest, while those with no music education scored lowest;

Parents' monthly income: Students from families with income >15,000 CNY scored significantly higher than those with $\leq 5,000$ CNY.

Impact of music learning engagement: Multiple linear regression analysis showed that all three dimensions had significant positive impacts on social skills (adjusted $R^2=0.995$, $p=0.000<0.05$):

Emotional engagement: $\beta=0.522$ (strongest impact);

Effort engagement: $\beta=0.400$;

Time engagement: $\beta=0.210$.

DISCUSSION

Demographic Factors and Social Skills

The findings align with Bronfenbrenner's Ecological Systems Theory, as demographic factors function as microsystem/exosystem variables that shape social



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development. Female students' higher social skills are consistent with Tomé-Fernández et al. (2024), who noted that females have advantages in interpersonal interaction. Age-related improvement in social skills supports Lopes et al. (2015), as older students accumulate more social experience. Longer music education correlates with better social skills (Olaniran, 1996) because music activities provide continuous opportunities for social practice. Higher parental income contributes to better social skills (Haskollar & Kohli Bagwe, 2023) by enabling access to more resources (e.g., music training, social activities).

Music Learning Engagement and Social Skills

The results verify Fredricks et al.'s Engagement Theory and Goleman's Social Intelligence Theory. Emotional engagement's strongest impact is consistent with Zhan (2025), as emotional connection to music motivates active social participation. Effort engagement promotes social resilience (Gooding, 2011), while time engagement provides a foundation for skill practice (Heyworth, 2013). The extremely high adjusted R^2 (0.995) reflects the strong correlation between music learning engagement and social skills, possibly due to sample homogeneity (all from high-quality schools with high music participation).

CONCLUSION

This study surveyed 600 middle school students to examine the effects of music engagement and demographic factors on social skills. Key conclusions: First, demographic factors significantly affect social skills—females, older students (14-15 years old), those with longer music education (≥ 4 years), and students from high-income families have better social skills. Second, music learning engagement (time, effort and emotion) has a strong positive impact on social skills, with emotional engagement being the most influential, followed by effort and time engagement. The three factors together explain 99.5% of the variance in social skills.

Practical implications: Educational institutions should optimize music curricula through collaborative activities (e.g., ensembles) to enhance social practice; provide inclusive music resources for disadvantaged groups (e.g., low-income families, males); and have teachers focus on emotional engagement by using student-centered music materials and guiding social interaction during practice.

Research limitations: Samples are limited to three high-quality schools, lacking representation of rural/weak schools; self-reported questionnaires may introduce response bias; a cross-sectional design cannot establish causality; unmeasured confounding variables (e.g., personality) may affect results. Future research should



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expand the sample scope, adopt longitudinal/qualitative methods, and compare music learning with other extracurricular activities to clarify unique effects.

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