Exploiting Idioms and Proverbs of Vietnamese Regions in Teaching Mathematics in Primary Schools

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Abstract

Mathematics and idioms, as well as proverbs, all reflect the laws of life. At the same time, primary school children may have heard idioms and proverbs before attending school. Therefore, there are many possibilities to exploit and apply idioms and proverbs in teaching mathematics in primary schools. This study aims to identify appropriate situations and apply idioms and proverbs in different regions of Vietnam to teaching mathematics. The researchers selected 1155 expressions related to mathematics from many typical pieces of research on idioms and proverbs in Vietnam. After surveying 1822 teachers three times in many provinces and cities in all 3 regions of Vietnam: the North, the Central and the South, the researchers have classified the data according to the criteria from closed to open-ended questions. The results show a prominent level of interest (level 4/5) of all teachers participating in the survey, and there is no difference in the effectiveness in the three regions, but there is a clear difference in regions in using idioms and proverbs. Particularly, identifying situations to teach geometric and quantitative knowledge, as well as probability and statistics, allows one to apply idioms and proverbs at a high level. It is concluded that if idioms and proverbs from Vietnamese regions are appropriately selected and applied in teaching mathematics in primary schools, they will contribute to improving students' mathematical ability and preserving the national cultural heritage.

1- Introduction

Idioms and proverbs are poetic parts of a language. They are a source of original knowledge that may be used to guide, build pride, and help form an identity [1]. Idioms and proverbs reflect a country's culture, ideas, experiences, customs, values, and global view. In this way, the finest indicators of a country's sharp mind, expansive imagination, and sensitive emotions are its proverbs. Each proverb has the nation's own imprint. Idioms and proverbs both bear the cultural imprint of a country. They resemble the fingerprints of a country. Because of their profound meaning, proverbs and idioms are important to teach [2]. The use of idioms and proverbs in teaching and learning in several countries across the world has been documented [3–6].

Mathematics is a science that also has the characteristics of reflecting laws of high logic, systems, and abstraction. Because of the same characteristic of reflecting laws, idioms, proverbs and mathematics can be applied in mathematics

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education [7–9]. The basic feature of teaching mathematics in primary education is mainly through description, explanation, or logical reasoning. Therefore, language from daily life should be used appropriately in mathematics textbooks, especially idioms and proverbs.

In Vietnam, a country with East Asian culture, idioms and proverbs are an essential part of its folklore. Idioms and proverbs reflect Vietnamese culture and often appear in daily life. For example, "A word of greeting is more satisfying than a feast"; "if a child surpasses his father, the home is blessed"; "if there are many stars, it is going to be sunny, without stars, it is going to rain"; "man can make plans, but God has the final say" [10–12]. Idioms and proverbs summarize people's experiences or laws of nature and society, passed on from generation to generation to help people towards truth - goodness - beauty.

The content of the mathematics curriculum in Vietnamese primary education includes three circuits of knowledge: numbers and calculations, geometry and measurement, and statistics and probability. The program emphasizes experiential activities developed from grade 1 to 12 [13]. The above contents are closely linked with idioms and proverbs, in which the number and calculus path - the most typical knowledge circuit of primary education mathematics has many idioms and proverbs related to this content. Some examples are "Nine skipping work, ten" (meaning, "Every fault needs pardon"); "A miss is as good as a mile.". These idioms and proverbs represent different computational concepts, states, and emotions. Furthermore, they express factors such as philosophy governing calculation in life.

Idioms and proverbs are generally used in the Vietnamese community in all three regions of the North, the Central, and the South. However, in each region and each ethnic group, there are groups of idioms and proverbs commonly used in life, along with common idioms and proverbs of Vietnam. Idioms and proverbs have been used in mathematics teaching in Vietnamese primary schools. But it seems that no research has been carried out to document these activities. This paper aims to identify situations and apply idioms and proverbs from different regions of Vietnam to the teaching of mathematics at the primary education level.

2- Literature Review

Idioms and proverbs are part of every country's national culture and are an essential part of daily life. Consequently, researchers worldwide are interested in connecting the contents of idioms and proverbs to teaching and learning at different educational levels and subjects. For example, Hayran (2017) calculated the number of proverbs and idioms in Turkish children's books taught to elementary school students and discovered that the percentage of idioms and proverbs was insufficient [14]. However, Ajoke et al. (2015) examine the use of proverbs in teaching English as a second language in Nigerian secondary schools and conclude that proverbs and idioms are a significant part of the English language and are a universal artistic expression [3]. Similar findings are also mentioned in Hinkel's (2017) research and Tamimy's (2019) observation [4, 5]. Idioms and proverbs are regarded as essential socio-cultural tools for lifelong learning [2], included in HIV and AIDS messages for young people [15], or utilized to understand work ethics [16]. In addition, stories, idioms, and proverbs have been employed as cultural teaching aids to impart environmental knowledge to young people [6].

Studies on idioms, proverbs, folktales, and poems in mathematics teaching have received great attention from many researchers worldwide. First, Nichol (2022) has listed 100 English idioms that specialize in numbers that are close and friendly to the daily lives of primary students. Some idioms that are easy to understand are "Two wrongs don't make a right", "A million miles away", "As easy as one-two-three", and "Kill two birds with one stone" [17]. Furthermore, Tsarev (1998) discusses the role, meaning and particular relevance of the correct selection of proverbs, poems, and riddles in teaching mathematics in primary schools. Through the author's observation, poems, riddles, and proverbs in teaching math arouse children's positive emotions in learning mathematics and make it more colorful and exciting. For students to be more active and stimulate their exploration, the author also proposes a way for students to find proverbs related to the mathematical content they have learned and organize games related to mathematics to remember those proverbs [8]. Additionally, Raki (2022) introduces materials on mathematics-related idioms in Raki's Rad resources. These are divided into eight major topics, including (1) idioms about quantity (two is better than one; two wrongs do not lead to one right); (2) idioms about money (not worth a penny; not a penny in pocket); (3) idioms about the system (make a big change; the difference doesn't matter); (4) probability idioms (nine out of ten; one in a million); (5) idioms about time (sooner or later; on time); (6) idioms about fractions (all whole; subdivided many times); (7) idioms about position (about the starting line; direct confrontation); and (8) idioms about measurement (weighing; balancing; lightning fast) [9].

In the Vietnamese primary education context, idioms and proverbs are short, simple phrases and sentences rich in images and very meaningful. Primary school students learn idioms and proverbs in subjects such as literature and Vietnamese to see the beauty of the national language, and respect and love the original values. Moreover, idioms and proverbs are also introduced in other subjects such as Ethics to teach children towards good order and lifestyle. Or, in social sciences, they help them easily remember the rules of the surrounding natural environment and see the closeness of Vietnamese to their daily lives [18]. However, the researchers calculated the number of idioms and proverbs appearing in the textbooks of Mathematics, Vietnamese and Sciences in grades 3, 4, 5 and discovered that the Vietnamese have

175, the Sciences has 8, and Mathematics has 0. It seems that idioms and proverbs have not been officially taught in primary mathematics textbooks. Some folk games, folk songs, fairy tales and other tangible and intangible cultural heritages have been introduced in several documents on teaching mathematics in primary schools, but they have not expressed their views on how to select and use those documents. Moreover, in fairy tales, there are fictional elements, and folk songs mainly express feelings in the family and society, while idioms and proverbs are summaries of experiences from real life to bring good values to people. Therefore, it is necessary to determine the orientations for selecting and using idioms and proverbs in teaching mathematics in primary schools [18].

3- Materials and Methods

Since using idioms and proverbs in mathematics teaching is relatively new in Vietnamese primary schools, the research implemented a survey questionnaire with mathematics teachers. In quantitative research, surveys are vital tools used to collect information on individual perspectives in a large cohort [19]. There are four main advantages to using a questionnaire (Appendix I). These are efficient uses of time, provide anonymity (for the respondent), have the possibility of a high return rate, and are standardized questions [20]. In this research, primary school teachers were selected as the respondents, as they are involved in classroom activities and experienced in using idioms and proverbs in teaching. The data collection procedure for this research included three stages (Figure 1).

Stage 1: The researchers collected documents related to Vietnamese idioms and proverbs by surveying primary school teachers twice with five closed mathematics teaching questions (in March and July 2021).

Stage 2: The researchers identified the criteria to categorize the idioms and proverbs related to mathematics and surveyed the teachers based on three categories.

Stage 3: The researchers surveyed 149 teachers in different regions with five open-ended questions to identify the common and different features of using idioms and proverbs in teaching mathematics at the primary education level. Moreover, the researchers also explored the changed and unchanged factors through three times of surveying.
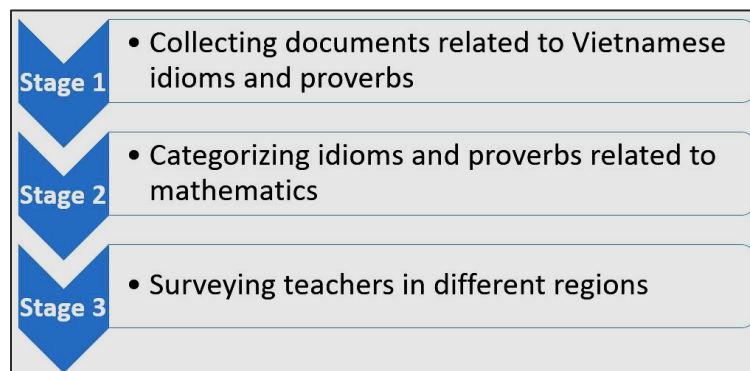
Figure 1. Stages of the data collection procedure

The results from closed questions provided quantitative data, while the findings from open-ended questions gave qualitative data.

Totally, 1,822 primary school teachers participated in the survey, and the sample detail is presented in Table 1.

Table 1. Description of the research sample

By region			By location			By participants' feature		
Region	Number	%	Location	Number	%	Feature	Number	%
North	1481	81.3	Rural	981	53.8	Vietnamese groups	1583	86.9
Central	103	5.7	Mountainous	280	15.4	Ethic minority groups	239	13.1
South	238	13.1	Urban	561	30.8			

4- Results

4-1- Effectiveness of Using Idioms and Proverbs in Teaching Mathematics

The research selected 38 idioms and proverbs to test the effectiveness of using these idioms and proverbs in teaching mathematics in primary schools. The study used a 5-level Likert scale to measure, in which level 1 is Ineffective while level 5 is Very effective. Consequently, the minimum mean score for each item (idiom or proverb) is 1, while the maximum mean score is 5. Table 2 highlights the results.

Table 2. The effectiveness of using idioms and proverbs in teaching mathematics

	Idiom/proverb	Mean
1.	When the lightning flashes in the east and the roosters crow, it is going to rain	3.0329
2.	If you see black clouds in the east, it is going to rain very heavily	3.0505
3.	His eyes can measure things	3.0966
4.	A word of greeting is more satisfying than a feast	3.3139
5.	When eating watch out for the food, when sitting watch out for the direction	3.2849
6.	When dragonflies fly at a low level, it will rain	3.3458
7.	Frog in the well	3.2377
8.	Being rich or poor depends on your eyes and hands	3.3008
9.	If you wish good advice, consult an old man when you are outside and a child when you are at home	3.3046
10.	From father's generation to children's generation, to make a circle a square must be made first	3.2426
11.	No wealthy family remains wealthy longer than 3 generations, no poor family remains poor after the 3rd generation	3.2464
12.	Please don't leave the wasteland	3.4050
13.	The younger and older brother are two halves of one	3.2569
14.	Eat less but more delicious	3.2289
15.	Eat rice in May and watch the moon in Mid-August	3.2409
16.	Having only a bow of porridge, but having to run three distances	3.2859
17.	Three dew and one sun	3.2580
18.	A child can roll at three months old, crawl at seven months old and start to walk at nine months old	3.3452
19.	100 battles, 100 victories	3.3474
20.	A 70-year-old man still learns from a 71-year-old man	3.3491
21.	Low step, high step	3.2777
22.	A relative of the 10th generation is closer than a stranger	3.1405
23.	Barrier in front, fence behind	3.1965
24.	Split one hair in quarters	3.1361
25.	Dividing into five, splitting into seven	3.4418
26.	Nine skipping work ten	3.4133
27.	Banana trees behind, areca trees in front	3.1383
28.	Having the merit of grinding iron can make a needle	3.6136
29.	If you study, you will know, if you go, you will arrive	3.5099
30.	There is before there is after	3.4671
31.	If a child surpasses his father, the home is blessed	3.3738
32.	Few gifts but a lot of love (It's the thought that counts)	3.3996
33.	Building a 9-floor temple is not as worth as saving a person	3.2146
34.	Hair with two kinds of colours	3.1844
35.	Putting salt into the sea (a drop in the bucket)	3.2042
36.	Can count on the fingers of one hand	3.4127
37.	The more you travel, the more you learn	3.5615
38.	Two times five equals ten (It's as clear as daylight)	3.4248

It can be seen that all the idioms/proverbs received a mean score of above 3.0 (out of 5.0). Eight idioms/proverbs received a mean score of above 3.40. They include Please don't leave the wasteland, Dividing into five, splitting into seven, Nine skipping work ten, Having the merit of grinding iron can make a needle, If you study, you will know, if you go, you will arrive, There is before there is after, Can count on the fingers of one hand, The more you travel, the more you learn, Two times five equals ten (It's as clear as daylight). These idioms and proverbs were evaluated effectively in teaching mathematics by the teachers.

4-2- Comparison of Mean Scores among three Regions

The effectiveness of using idioms and proverbs in teaching mathematics in primary schools in three Vietnamese regions (the North, the Central and the South) was analyzed by ANOVA test (Table 3).

Table 3. Results of ANOVA test on mean scores among three regions (the North, the Central, the South)

Idiom/proverb			Sum of Squares	df	Mean Square	F	Sig.
When the lightning flashes in the east and the roosters crow, it is going to rain * Region	Between Groups	(Combined)	0.776	2	0.388	0.354	0.702
	Within Groups		1991.248	1819	1.095		
	Total		1992.024	1821			
If you see black clouds in the east, it is going to rain very heavily * Region	Between Groups	(Combined)	1.687	2	0.844	0.761	0.467
	Within Groups		2015.668	1819	1.108		
	Total		2017.355	1821			
His eyes can measure things * Region	Between Groups	(Combined)	1.758	2	0.879	0.893	0.410
	Within Groups		1791.241	1819	0.985		
	Total		1792.999	1821			
A word of greeting is more satisfying than a feast * Region	Between Groups	(Combined)	2.788	2	1.394	1.147	0.318
	Within Groups		2209.638	1819	1.215		
	Total		2212.426	1821			
When eating watch out for the food, when sitting watch out for the direction * Region	Between Groups	(Combined)	0.782	2	0.391	0.317	0.729
	Within Groups		2248.379	1819	1.236		
	Total		2249.162	1821			
When dragonflies fly at a low level, it will rain * Region	Between Groups	(Combined)	3.502	2	1.751	1.526	0.218
	Within Groups		2086.661	1819	1.147		
	Total		2090.162	1821			
Frog in the well * Region	Between Groups	(Combined)	7.607	2	3.804	3.435	0.032
	Within Groups		2014.490	1819	1.107		
	Total		2022.097	1821			
Being rich or poor depends on your eyes and hands * Region	Between Groups	(Combined)	3.190	2	1.595	1.471	0.230
	Within Groups		1971.989	1819	1.084		
	Total		1975.179	1821			
If you wish good advice, consult an old man when you are outside and a child when you are at home * Region	Between Groups	(Combined)	0.394	2	0.197	0.165	0.848
	Within Groups		2171.548	1819	1.194		
	Total		2171.941	1821			
From father's generation to children's generation, to make a circle a square must be made first * Region	Between Groups	(Combined)	4.147	2	2.074	2.065	0.127
	Within Groups		1826.628	1819	1.004		
	Total		1830.775	1821			
No wealthy family remains wealthy longer than 3 generations, no poor family remains poor after the 3rd generation * Region	Between Groups	(Combined)	4.200	2	2.100	1.921	0.147
	Within Groups		1988.152	1819	1.093		
	Total		1992.352	1821			
Please don't leave the wasteland * Region	Between Groups	(Combined)	5.021	2	2.510	2.245	0.106
	Within Groups		2034.053	1819	1.118		
	Total		2039.074	1821			
The younger and older brother are two halves of one * Region	Between Groups	(Combined)	1.366	2	0.683	0.623	0.536
	Within Groups		1992.424	1819	1.095		
	Total		1993.789	1821			
Eat less but more delicious * Region	Between Groups	(Combined)	13.573	2	6.787	6.254	0.002
	Within Groups		1973.988	1819	1.085		
	Total		1987.561	1821			
Eat rice in May and watch the moon in Mid-August * Region	Between Groups	(Combined)	3.864	2	1.932	1.919	0.147
	Within Groups		1831.362	1819	1.007		
	Total		1835.226	1821			
Having only a bow of porridge, but having to run three distances * Region	Between Groups	(Combined)	7.396	2	3.698	3.727	0.024
	Within Groups		1804.625	1819	0.992		
	Total		1812.020	1821			

Three dew and one sun * Region	Between Groups	(Combined)	13.571	2	6.785	6.632	0.001
	Within Groups		1861.189	1819	1.023		
	Total		1874.760	1821			
A child can roll at three months old, crawl at seven months old and start to walk at nine months old * Region	Between Groups	(Combined)	2.447	2	1.224	1.233	0.292
	Within Groups		1805.406	1819	0.993		
	Total		1807.853	1821			
100 battles, 100 victories * Region	Between Groups	(Combined)	2.548	2	1.274	1.228	0.293
	Within Groups		1886.535	1819	1.037		
	Total		1889.083	1821			
A 70-yearl-old man still learns from a 71-year-old man * Region	Between Groups	(Combined)	4.700	2	2.350	2.402	0.091
	Within Groups		1779.293	1819	0.978		
	Total		1783.993	1821			
Low step, high step * Region	Between Groups	(Combined)	5.228	2	2.614	2.615	0.073
	Within Groups		1818.248	1819	1.000		
	Total		1823.475	1821			
A relative of the 10th generation is closer than a stranger * Region	Between Groups	(Combined)	9.056	2	4.528	4.407	0.012
	Within Groups		1868.975	1819	1.027		
	Total		1878.031	1821			
Barrier in front, fence behind * Region	Between Groups	(Combined)	10.913	2	5.456	5.421	0.004
	Within Groups		1830.745	1819	1.006		
	Total		1841.658	1821			
Split one hair in quarters * Region	Between Groups	(Combined)	5.362	2	2.681	2.696	0.068
	Within Groups		1808.881	1819	0.994		
	Total		1814.244	1821			
Dividing into five, splitting into seven * Region	Between Groups	(Combined)	2.335	2	1.168	1.197	0.302
	Within Groups		1774.998	1819	0.976		
	Total		1777.333	1821			
Nine skipping work ten * Region	Between Groups	(Combined)	2.405	2	1.202	1.160	0.314
	Within Groups		1885.394	1819	1.037		
	Total		1887.799	1821			
Banana trees behind, areca trees in front * Region	Between Groups	(Combined)	9.755	2	4.878	4.736	0.009
	Within Groups		1873.391	1819	1.030		
	Total		1883.146	1821			
Having the merit of grinding iron can make a needle * Region	Between Groups	(Combined)	2.152	2	1.076	0.919	0.399
	Within Groups		2129.831	1819	1.171		
	Total		2131.982	1821			
If you study, you will know, if you go, you will arrive * Region	Between Groups	(Combined)	0.965	2	0.483	0.434	0.648
	Within Groups		2024.357	1819	1.113		
	Total		2025.322	1821			
There is before there is after * Region	Between Groups	(Combined)	1.951	2	0.976	0.941	0.390
	Within Groups		1885.573	1819	1.037		
	Total		1887.524	1821			
If a child surpasses his father, the home is blessed * Region	Between Groups	(Combined)	0.240	2	0.120	0.105	0.900
	Within Groups		2078.226	1819	1.143		
	Total		2078.466	1821			
Few gifts but a lot of love * Region	Between Groups	(Combined)	10.502	2	5.251	4.635	0.010
	Within Groups		2060.617	1819	1.133		
	Total		2071.120	1821			
Building a 9-floor temple is not as worth as saving a person * Region	Between Groups	(Combined)	3.430	2	1.715	1.587	0.205
	Within Groups		1965.662	1819	1.081		
	Total		1969.092	1821			

			Sum of Squares	df	Mean Square	F	Sig.
Hair with two kinds of colours * Region	Between Groups	(Combined)	11.779	2	5.889	5.527	0.004
	Within Groups		1938.259	1819	1.066		
	Total		1950.037	1821			
Putting salt into the sea * Region	Between Groups	(Combined)	2.018	2	1.009	0.927	0.396
	Within Groups		1980.030	1819	1.089		
	Total		1982.048	1821			
Can count on the fingers of one hand * Region	Between Groups	(Combined)	5.009	2	2.505	2.486	0.084
	Within Groups		1832.615	1819	1.007		
	Total		1837.625	1821			
The more you travel, the more you learn * Region	Between Groups	(Combined)	.307	2	0.154	0.133	0.875
	Within Groups		2096.308	1819	1.152		
	Total		2096.615	1821			
Two times five equals ten	Between Groups	(Combined)	1.437	2	0.718	0.689	0.502
	Within Groups		1895.762	1819	1.042		
	Total		1897.199	1821			

It can be seen that there are 9 idioms/proverbs having the Sig value of less than 0.05. These idioms/proverbs are *Frog in the well, Eat less but more delicious, Having only a bow of porridge, but having to run three distances, Three dew and one sun, A relative of the 10th generation is closer than a stranger, Barrier in front, fence behind, Hair with two kinds of colours, Banana trees behind, areca trees in front, Few gifts but a lot of love*. This means there is a difference in statistics among the regions for using these idioms and proverbs in mathematics teaching.

4-3- Comparison of Mean Scores among Three Locations

The effectiveness of using idioms and proverbs in teaching mathematics in primary schools in three Vietnamese locations (Mountainous, Rural and Urban) was analyzed by ANOVA test (Table 4).

Table 4. Results of ANOVA test on the mean scores among the three locations (Mountainous, Rural, Urban)

Idiom/proverb			Sum of Squares	df	Mean Square	F	Sig.
When the lightning flashes in the east and the roosters crow, it is going to rain * Location	Between Groups	(Combined)	3.528	2	1.764	1.613	0.199
	Within Groups		1988.496	1819	1.093		
	Total		1992.024	1821			
If you see black clouds in the east, it is going to rain very heavily * Location	Between Groups	(Combined)	3.173	2	1.586	1.433	0.239
	Within Groups		2014.182	1819	1.107		
	Total		2017.355	1821			
His eyes can measure things * Location	Between Groups	(Combined)	3.751	2	1.875	1.907	0.149
	Within Groups		1789.248	1819	0.984		
	Total		1792.999	1821			
A word of greeting is more satisfying than a feast * Location	Between Groups	(Combined)	7.865	2	3.933	3.245	0.039
	Within Groups		2204.561	1819	1.212		
	Total		2212.426	1821			
When eating watch out for the food, when sitting watch out for the direction * Location	Between Groups	(Combined)	4.778	2	2.389	1.936	0.145
	Within Groups		2244.384	1819	1.234		
	Total		2249.162	1821			
When dragonflies fly at a low level, it will rain * Location	Between Groups	(Combined)	6.701	2	3.351	2.925	0.054
	Within Groups		2083.461	1819	1.145		
	Total		2090.162	1821			
Frog in the well * Location	Between Groups	(Combined)	14.166	2	7.083	6.417	0.002
	Within Groups		2007.931	1819	1.104		
	Total		2022.097	1821			
Being rich or poor depends on your eyes and hands * Location	Between Groups	(Combined)	4.443	2	2.222	2.051	0.129
	Within Groups		1970.736	1819	1.083		
	Total		1975.179	1821			

If you wish good advice, consult an old man when you are outside and a child when you are at home * Location	Between Groups	(Combined)	4.921	2	2.460	2.065	0.127
	Within Groups		2167.020	1819	1.191		
	Total		2171.941	1821			
From father's generation to children's generation, to make a circle a square must be made first * Location	Between Groups	(Combined)	6.816	2	3.408	3.399	0.034
	Within Groups		1823.959	1819	1.003		
	Total		1830.775	1821			
No wealthy family remains wealthy longer than 3 generations, no poor family remains poor after the 3rd generation * Location	Between Groups	(Combined)	4.341	2	2.170	1.986	0.138
	Within Groups		1988.011	1819	1.093		
	Total		1992.352	1821			
Please don't leave the wasteland * Location	Between Groups	(Combined)	6.617	2	3.308	2.961	0.052
	Within Groups		2032.457	1819	1.117		
	Total		2039.074	1821			
The younger and older brother are two halves of one * Location	Between Groups	(Combined)	5.624	2	2.812	2.573	0.077
	Within Groups		1988.165	1819	1.093		
	Total		1993.789	1821			
Eat less but more delicious * Location	Between Groups	(Combined)	19.263	2	9.631	8.901	0.000
	Within Groups		1968.299	1819	1.082		
	Total		1987.561	1821			
Eat rice in May and watch the moon in Mid-August * Location	Between Groups	(Combined)	12.642	2	6.321	6.309	0.002
	Within Groups		1822.583	1819	1.002		
	Total		1835.226	1821			
Having only a bow of porridge, but having to run three distances * Location	Between Groups	(Combined)	10.783	2	5.392	5.445	0.004
	Within Groups		1801.237	1819	0.990		
	Total		1812.020	1821			
Three dew and one sun * Location	Between Groups	(Combined)	16.050	2	8.025	7.853	0.000
	Within Groups		1858.710	1819	1.022		
	Total		1874.760	1821			
A child can roll at three months old, crawl at seven months old and start to walk at nine months old * Location	Between Groups	(Combined)	10.990	2	5.495	5.562	0.004
	Within Groups		1796.864	1819	0.988		
	Total		1807.853	1821			
100 battles, 100 victories * Location	Between Groups	(Combined)	20.315	2	10.157	9.887	0.000
	Within Groups		1868.768	1819	1.027		
	Total		1889.083	1821			
A 70-yearl-old man still learns from a 71-year-old man * Location	Between Groups	(Combined)	12.106	2	6.053	6.214	0.002
	Within Groups		1771.887	1819	0.974		
	Total		1783.993	1821			
Low step, high step * Location	Between Groups	(Combined)	16.576	2	8.288	8.344	0.000
	Within Groups		1806.899	1819	0.993		
	Total		1823.475	1821			
A relative of the 10th generation is closer than a stranger * Location	Between Groups	(Combined)	15.852	2	7.926	7.742	0.000
	Within Groups		1862.179	1819	1.024		
	Total		1878.031	1821			
Barrier in front, fence behind * Location	Between Groups	(Combined)	17.427	2	8.713	8.688	0.000
	Within Groups		1824.231	1819	1.003		
	Total		1841.658	1821			
Split one hair in quarters * Location	Between Groups	(Combined)	16.564	2	8.282	8.380	0.000
	Within Groups		1797.680	1819	0.988		
	Total		1814.244	1821			

Dividing into five, splitting into seven * Location	Between Groups	(Combined)	12.945	2	6.473	6.673	0.001
	Within Groups		1764.388	1819	0.970		
	Total		1777.333	1821			
Nine skipping work ten * Location	Between Groups	(Combined)	14.633	2	7.317	7.105	0.001
	Within Groups		1873.165	1819	1.030		
	Total		1887.799	1821			
Banana trees behind, areca trees in front * Location	Between Groups	(Combined)	11.684	2	5.842	5.678	0.003
	Within Groups		1871.462	1819	1.029		
	Total		1883.146	1821			
Having the merit of grinding iron can make a needle * Location	Between Groups	(Combined)	13.737	2	6.869	5.898	0.003
	Within Groups		2118.245	1819	1.165		
	Total		2131.982	1821			
If you study, you will know, if you go, you will arrive * Location	Between Groups	(Combined)	11.640	2	5.820	5.257	0.005
	Within Groups		2013.682	1819	1.107		
	Total		2025.322	1821			
There is before there is after * Location	Between Groups	(Combined)	11.662	2	5.831	5.654	0.004
	Within Groups		1875.863	1819	1.031		
	Total		1887.524	1821			
If a child surpasses his father, the home is blessed * Location	Between Groups	(Combined)	3.582	2	1.791	1.570	0.208
	Within Groups		2074.884	1819	1.141		
	Total		2078.466	1821			
Few gifts but a lot of love * Location	Between Groups	(Combined)	9.122	2	4.561	4.024	0.018
	Within Groups		2061.997	1819	1.134		
	Total		2071.120	1821			
Building a 9-floor temple is not as worth as saving a person * Location	Between Groups	(Combined)	3.341	2	1.670	1.546	0.213
	Within Groups		1965.751	1819	1.081		
	Total		1969.092	1821			
Hair with two kinds of colours * Location	Between Groups	(Combined)	15.995	2	7.998	7.522	0.001
	Within Groups		1934.042	1819	1.063		
	Total		1950.037	1821			
Putting salt into the sea * Location	Between Groups	(Combined)	8.828	2	4.414	4.069	0.017
	Within Groups		1973.220	1819	1.085		
	Total		1982.048	1821			
Can count on the fingers of one hand * Location	Between Groups	(Combined)	11.672	2	5.836	5.814	0.003
	Within Groups		1825.952	1819	1.004		
	Total		1837.625	1821			
The more you travel, the more you learn * Location	Between Groups	(Combined)	8.431	2	4.216	3.672	0.026
	Within Groups		2088.184	1819	1.148		
	Total		2096.615	1821			
Two times five equals ten * Location	Between Groups	(Combined)	10.608	2	5.304	5.114	0.006
	Within Groups		1886.591	1819	1.037		
	Total		1897.199	1821			

It can be seen that there are 26 idioms/proverbs having the Sig value of less than 0.05. This means there is a difference in statistics among the locations (mountainous areas, rural areas and urban areas) for using these idioms and proverbs in mathematics teaching.

4-4- Interest in Using Idioms and Proverbs in Teaching Mathematics in Primary Schools

The survey results show that primary school teachers were quite interested in using idioms and proverbs in teaching mathematics in their classrooms (Figure 2).
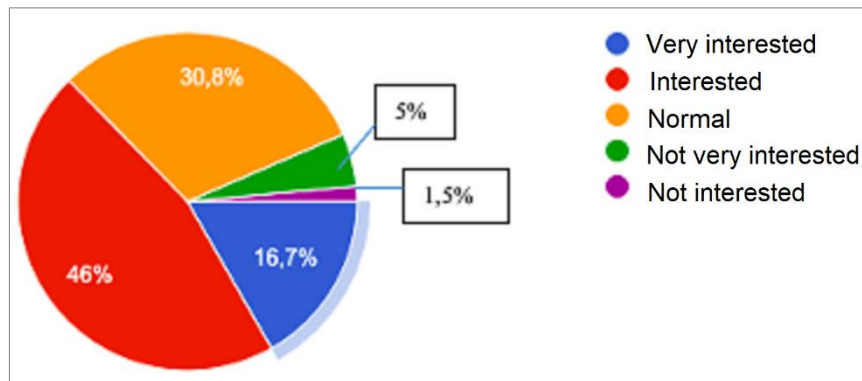
Figure 2. Teachers' interest in using idioms and proverbs in mathematics teaching

It can be seen that nearly 17% of the teachers were very interested, and 46% were interested in using idioms and proverbs in teaching mathematics. Meanwhile, only 5% of the teachers were not very interested, and 1.5% were not interested in this regard.

4-5- Methods of Using Idioms and Proverbs in Mathematics Teaching

The study also surveyed primary school teachers on how they used idioms and proverbs in teaching mathematics in their classrooms through a 5-level Likert scale, of which level 1 means Completely disagree while level 5 means Completely agree. The result is presented in Table 5.

Table 5. Methods of using idioms and proverbs in mathematics teaching

	N	Minimum	Maximum	Mean	Std. Deviation
Teaching integrated, interdisciplinary topics	1814	1.00	5.00	3.9289	.67573
Designing applied exercises	1808	1.00	5.00	3.7871	.74429
Designing advanced exercises	1810	1.00	5.00	3.7293	.79709
Giving examples	1806	1.00	5.00	4.0055	.65057
Others	1800	1.00	5.00	3.7861	.70756

It can be seen that the teachers used idioms and proverbs in different activities to teach mathematics. They used them the most frequently to give examples (mean score = 4.0), to teach integrated, interdisciplinary topics (mean score = 3.9), to design applied exercises (mean score = 3.8), and to design advanced exercises (mean score = 3.7).

4-6- Results of Open-Ended Questions

The study used open-ended questions to ask 149 primary school teachers in different regions about their interest in using idioms and proverbs in teaching mathematics in their classrooms. The result shows that 29 teachers (19%) expressed they were very interested, 109 teachers (73%) said they were interested, while only 5 teachers said it was normal, and 5 others were not interested. The study asked teachers about the probability of using idioms and proverbs in teaching knowledge circuits of mathematics, including numbers and calculations, geometry and measurement, and probability and statistics. The result is presented in Figure 3.
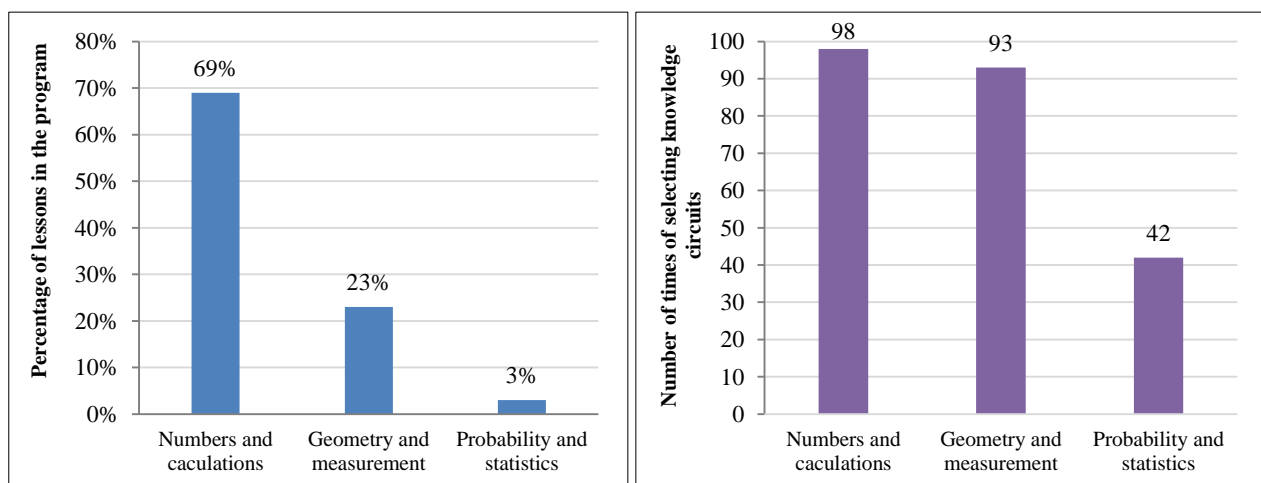

Figure 3. The probability of using idioms and proverbs in teaching knowledge circuits of mathematics

It can be seen that the knowledge circuits of numbers and calculations and geometry and measurement received the highest number of times, 98 and 93, respectively. This is almost twice as many times of selection of probability and statistical knowledge circuits.

Additionally, the study asked teachers about activities in which they used idioms and proverbs in the classroom. The result is highlighted in Table 6.

Table 6. Activities teachers used idioms and proverbs in the classroom

Activity	Warm-up	Discovery	Practice	Application	Review	Assessment
Number	54	69	50	64	86	37
%	36%	46%	34%	43%	58%	25%

The teachers participating in the study also pointed out the advantages and difficulties they encountered when they used idioms and proverbs in teaching mathematics in their primary education classrooms. The result is presented in Table 7.

Table 7. Advantages and difficulties when using idioms and proverbs

Difficulties from students	Difficulties from teachers		Difficulties in teaching conditions	Advantages
	Knowledge	Competence, experience		
84	23	16	1	7
68%	19%	13%	1%	6%

From 149 teachers, 123 indicated their suggestions to overcome the difficulties. Their recommendations are summarized in Table 8.

Table 8. Teachers' suggestions for the effectiveness of using idioms and proverbs in mathematics teaching

No.	Suggestions	Times
1	Teachers need to explain the meaning of the idioms and proverbs to students.	21
2	Teachers need to understand more about idioms and proverbs.	5
3	Teachers need to select suitable idioms and proverbs.	4
4	Teachers should ask students to look for more idioms and proverbs in dictionaries and the Internet.	4
5	Teachers need to select the idioms and proverbs that are close to students.	4
6	Teachers need to be trained more about using idioms and proverbs in teaching at the primary education level.	2
7	Teachers need to understand the meaning of each idiom and proverb deeply.	2
8	Teachers should collect and categorize idioms and proverbs according to the knowledge circuits.	3
9	Teachers should use idioms and proverbs in higher grades.	1
10	Teachers should talk to other teachers about using idioms and proverbs in mathematics teaching.	1
11	Teachers need more books and guidelines about using idioms and proverbs in mathematics teaching.	1
12	Teachers should provide idioms and proverbs to students according to the knowledge circuits.	1
13	Teachers should encourage students to learn by heart idioms and proverbs.	1
14	Teachers need to pay more attention to the lesson plans when using idioms and proverbs in mathematics teaching.	1
15	Teachers need to be well-prepared for the lesson and ask students to prepare at home.	1
16	Teachers need to be patient when teaching.	1
17	Teachers should use games related to idioms and proverbs.	1
18	Teachers should collaborate with parents.	1
19	Teachers should use idioms and proverbs together with visual materials.	1
20	Teachers should provide students with more vocabulary and reading skills.	1
21	Teachers should use idioms and proverbs flexibly in each lesson.	1

It can be seen that teachers should pay special attention to explaining to students the meaning of idioms and proverbs related to mathematical content in specific lessons. At the same time, idioms and proverbs must be familiar and appropriate to the student's understanding of mathematics and other subjects.

5- Discussion

First of all, the current research results show that idioms and proverbs can be used in teaching mathematics in Vietnamese primary schools. Specifically, 38 idioms and proverbs in the survey received at least 3 mean scores (out of 5). The associated literature points out that teaching science can benefit from using tales, idioms, and proverbs. For example, Mutonyi (2016) argues that idioms and proverbs might assist in scaffolding children's knowledge of certain scientific topics, potentially opening up the science field to many who might not be interested in learning it [6]. Additionally, these research findings echo that of Hoang et al. (2021). [7], who categorized 1,155 Vietnamese idioms and proverbs into five mathematical competencies and recommended using them in teaching mathematics. This research indicates that primary school teachers observed the effectiveness of using idioms and proverbs in their mathematics lessons.

The ANOVA test for region reveals that the sig value of 9 idioms/proverbs is less than 0.05, which means there is a difference in statistics among the regions. These results indicate that some idioms and proverbs, when used in teaching mathematics in primary schools, need to pay attention to the characteristics of each region. There may be idioms and proverbs that are effective for students in the North but less effective in the Central and Southern regions, and vice versa. In addition to the idioms and proverbs that are common to the whole of Vietnam in the different areas or ethnic groups, teachers need to choose the most appropriate idioms and proverbs to create opportunities for students to learn mathematics and Vietnamese at the same time as well as their ethnic languages and other subjects. This finding is in line with that of McNaught et al. (2014), who observed the primary classroom practices in three different regions of China (Shanghai, Hong Kong, and Chongqing). They identified major differences in teaching methods, classroom activities, and curriculum implementation in schools in these regions [21]. Consequently, it can be seen that besides idioms and proverbs common to all three regions and ethnic groups in Vietnam, there are also very specific idioms and proverbs that are convenient for teachers to choose and apply in specific situations. With such an approach to applying idioms and proverbs to teaching mathematics in primary schools, students will feel the closeness and familiarity of idioms and proverbs with mathematical knowledge and skills. Teaching mathematics in this way creates excitement and confidence for each student, even though they are studying at the elementary level.

With over 62% of the teachers showing an interest in using idioms and proverbs in their mathematics lessons, it can be seen that primary school teachers in Vietnam found it interesting and useful to implement idioms and proverbs in their classrooms. This is an advantage for teachers to exploit idioms and proverbs in Vietnamese culture for mathematics teaching. This finding supports the work of Hoang et al. (2021), who suggested that teachers actively choose idioms and proverbs and apply them flexibly in teaching mathematics to suit the learning styles of each student and group of students in the class [7]. Idioms and proverbs can be used in different classroom activities, including teaching integrated, interdisciplinary topics, designing applied exercises, or designing applied exercises. Primary school teachers are interested in using idioms and proverbs in their mathematics classrooms because most of them are familiar with knowledge related to idioms and proverbs in the Vietnamese subject. They hope to find the relationship between idioms and proverbs with primary mathematics knowledge.

The study also shows that the implementation of idioms and proverbs was the most effective when teaching knowledge circuits of probability and statistics, geometry and measurement. This is the fundamental and compulsory knowledge in the new national general education curricula for mathematics [13]. In Vietnamese culture, these knowledge circuits are reflected through experiences and life rules that have been condensed into idioms and proverbs. The research results also show that teachers used idioms and proverbs in different lesson stages, from warm-up to assessment. However, most of the teachers used them for reviewing. This finding agrees with that of Hoang et al. (2021). [7] who found that idioms and proverbs are also effective for warm-up activities as they attract students' attention and excite them. It is recommended that primary school teachers should decide which stages to use idioms and proverbs in their mathematics lessons. Moreover, they should also select the idioms and proverbs carefully as one idiom or proverbs can be effectively used in one stage but is ineffective in another stage.

When using idioms and proverbs in teaching mathematics, primary school teachers in Vietnam met several difficulties, including their limited knowledge, experience, and teaching conditions. Consequently, they proposed several suggestions that were expected to help them use idioms and proverbs more effectively in their mathematics lessons. Many teachers wished to be trained more about using idioms and proverbs in teaching at the primary education level. Obviously, professional development for primary school teachers should receive special attention [22–25], particularly in the context of Vietnam [26]. Moreover, reference books and learning materials on the selection and implementation of idioms and proverbs in teaching mathematics at the primary education level should be developed and provided to the teachers.

6- Conclusion

The power of idioms and proverbs in drawing young learners' attention to mathematics lessons has been observed in Vietnamese primary schools. These cultural values can be used in formal mathematics classrooms to attract more children into mathematics lessons. They were stated to be effective in making connections between what primary school

students have already known and how mathematics enables them to understand mathematical knowledge circuits better. Moreover, using idioms and proverbs in mathematics teaching could help children remember mathematics numbers and calculations and value the nation's culture.

Using idioms and proverbs in teaching mathematics in primary schools brings many benefits. They create positive learning environments with an experiential nature and opportunities for students to practice solving simple problems in life, which helps develop their mathematical competence. However, to implement idioms and proverbs more effectively in the classroom, primary school teachers need to choose those suitable for the knowledge circuits, topics, and content of each lesson. At the primary education level, teachers should focus on idioms and proverbs related to the knowledge circuits of geometry, measurement, probability, and statistics. Teachers should also select idioms and proverbs suitable to the teaching situation, especially the stages of discovery, application, and review in each lesson. Additionally, they should exploit idioms and proverbs typical of Vietnam's regions and ethnic groups.

7- Declarations

7-1- Author Contributions

Conceptualization, C-K.H. and Q-C.V.; methodology, D-T.P.; software, T.D.; validation, T.P., D-C.L. and T-C.N.; formal analysis, M-N.N.; investigation, D-T.P.; resources, C-K.H.; data curation, T.D.; writing—original draft preparation, C-K.H.; writing—review and editing, T.P.; visualization, T-C.N.; supervision, Q-C.V.; project administration, C-K.H.; funding acquisition, T.P. All authors have read and agreed to the published version of the manuscript.

7-2- Data Availability Statement

The data presented in this study are available on request from the corresponding author.

7-3- Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

7-4- Institutional Review Board Statement

Not applicable.

7-5- Informed Consent Statement

Written informed consent from the patients/participants was not required to participate in this study in accordance with the national legislation and the institutional requirements.

7-6- Conflicts of Interest

The authors declare that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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Appendix I: Questionnaire for Teachers

Dear teachers,

We are conducting a research project on using idioms and proverbs in teaching mathematics at primary schools. We would like you to spend about 15 minutes answering the questions in this survey. Your answers are very important for us to complete this research. All the information provided will be completely confidential and will be used for academic purposes only.

Thank you very much for your participation.

1. Which region are you working in?

☐ The North   ☐ The Central   ☐ The South

2. Which area are you working in?

☐ Mountainous   ☐ Rural   ☐ Urban

3. How effective is each of the following idioms/proverbs when it has been used to teach mathematics? (1 – Not effective; 2 – Not very effective; 3 – Normal; 4 – Effective; 5 – Very effective)

Idiom/Proverb	Select the most appropriate option				
1. When the lightning flashes in the east and the roosters crow, it is going to rain	①	②	③	④	⑤
2. If you see black clouds in the east, it is going to rain very heavily	①	②	③	④	⑤
3. His eyes can measure things	①	②	③	④	⑤
4. A word of greeting is more satisfying than a feast	①	②	③	④	⑤
5. When eating watch out for the food, when sitting watch out for the direction	①	②	③	④	⑤
6. When dragonflies fly at a low level, it will rain	①	②	③	④	⑤
7. Frog in the well	①	②	③	④	⑤
8. Being rich or poor depends on your eyes and hands	①	②	③	④	⑤
9. If you wish good advice, consult an old man when you are outside and a child when you are at home	①	②	③	④	⑤
10. From father's generation to children's generation, to make a circle a square must be made first	①	②	③	④	⑤
11. No wealthy family remains wealthy longer than 3 generations, no poor family remains poor after the 3rd generation	①	②	③	④	⑤
12. Please don't leave the wasteland	①	②	③	④	⑤
13. The younger and older brother are two halves of one	①	②	③	④	⑤
14. Eat less but more delicious	①	②	③	④	⑤
15. Eat rice in May and watch the moon in Mid-August	①	②	③	④	⑤
16. Having only a bow of porridge, but having to run three distances	①	②	③	④	⑤
17. Three dew and one sun	①	②	③	④	⑤
18. A child can roll at three months old, crawl at seven months old and start to walk at nine months old	①	②	③	④	⑤
19. 100 battles, 100 victories	①	②	③	④	⑤
20. A 70-year-old man still learns from a 71-year-old man	①	②	③	④	⑤
21. Low step, high step	①	②	③	④	⑤
22. A relative of the 10th generation is closer than a stranger	①	②	③	④	⑤
23. Barrier in front, fence behind	①	②	③	④	⑤
24. Split one hair in quarters	①	②	③	④	⑤
25. Dividing into five, splitting into seven	①	②	③	④	⑤
26. Nine skipping work ten	①	②	③	④	⑤
27. Banana trees behind, areca trees in front	①	②	③	④	⑤
28. Having the merit of grinding iron can make a needle	①	②	③	④	⑤
29. If you study, you will know, if you go, you will arrive	①	②	③	④	⑤
30. There is before there is after	①	②	③	④	⑤
31. If a child surpasses his father, the home is blessed	①	②	③	④	⑤
32. Few gifts but a lot of love (It's the thought that counts)	①	②	③	④	⑤
33. Building a 9-floor temple is not as worth as saving a person	①	②	③	④	⑤
34. Hair with two kinds of colours	①	②	③	④	⑤
35. Putting salt into the sea (a drop in the bucket)	①	②	③	④	⑤
36. Can count on the fingers of one hand	①	②	③	④	⑤
37. The more you travel, the more you learn	①	②	③	④	⑤
38. Two times five equals ten (It's as clear as daylight)	①	②	③	④	⑤

4. How are you interested in using idioms and proverbs in teaching mathematics at the primary education level?

☐ Very interested

☐ Interested

☐ Normal

☐ Not very interested

☐ Not interested

5. What is your opinion of using idioms and proverbs in teaching mathematics in classroom activities? (1 – Completely disagree; 2 – Disagree; 3 – Normal; 4 – Agree; 5 – Completely agree)

1.	Teaching integrated, interdisciplinary topics	①	②	③	④	⑤
2.	Designing applied exercises	①	②	③	④	⑤
3.	Designing advanced exercises	①	②	③	④	⑤
4.	Giving examples	①	②	③	④	⑤
5.	Others	①	②	③	④	⑤